A novel cash-plus intervention to safeguard sexual reproductive health and HIV vulnerabilities in young women in Cape Town, South Africa.

Noncayana Tracey Dawn Naledi

Student Number: DHLNON001

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Supervisors:

Professor Linda-Gail Bekker, Department of Medicine,

University of Cape Town

Professor Leslie London, Department of Public Health, University of Cape Town

Declaration on the inclusion of publication this PhD Thesis

I, Noncayana Tracey Dawn Naledi, hereby declare that the work on this thesis is based on my original work and that neither the whole work nor any part of it has been, or is being, submitted for another degree in this or any other university.

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1. **Naledi T**, Little F, Pike C, Edwards H, Robbertze D, Wagner C, London L, Bekker LG; "Women of Worth: the impact of a cash plus intervention to enhance attendance and reduce sexual health risks for young women in Cape Town, South Africa

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Abstract

Background

Cash plus interventions augment cash transfers with other empowering interventions to influence behaviours. This research assesses the Women of Worth (WoW) program and evaluates the effectiveness of a cash transfer (CT) of ZAR300 (USD22) conditional on attending a 12-session customised empowerment intervention to improve SRH/HIV outcomes in young women (19-24yrs) in Cape Town, South Africa.

Methods

A multi-phase, mixed-methods, experimental study targeting 10 000 participants in two subdistricts was conducted. Participants were randomised 1:1 to receive the intervention with CT ("cash + care" or C+C) or without CT (“Care”). Phase 1a piloted the intervention, Phase 1b implemented an adapted intervention, and Phase 2 was an open label C+C only scale up demonstration phase. Logistic regression models were fitted with subject-specific random mixed effects, to estimate changes in self-reported HIV, behavioural and structural SRH risks from baseline to (a) end of WoW and (b) follow up (6-30months post-exposure) irrespective of WoW completion. Mixed research methods were used to optimise engagement, evaluate implementation fidelity and determine the pathways of effectiveness for the intervention.

Results

The Women of Worth empowerment programme was implemented with adequate fidelity however adaptative research methods were essential for ensuring a sustained programme. 8765 (87,7%) of the 9995 WoW initiators were evaluated with 904 (10,3%); 4212 (48,1%) and 3649 (41,6%) women in Phases 1a, 1b and 2 respectively. In Phase 1a & 1b, participants in the “C+C” group were 60 times (OR 60.37; 95%CI: 17.32; 210.50.p <0.001) more likely to complete ≥ 11 sessions vs the “care” group. Due to high “care” group attrition, study arm estimates were pooled and showed a 3-fold (p <0.001) increase in the employment status of the Women of Worth completers compared to baseline. Changes in SRH behavioural risk factors were mixed, positively impacting experiences of gender-based violence, transactional sex and forced sex and increased uptake of contraception and STI treatments at programme completion. There was no measurable impact on self-reported HIV status. Employment status was sustained to a 2.5-fold increase (p <0.001) at a median of 15 months [IQR:13,3;17,8]). The pathway of effect for the programme was likely through the building of self-determination.

Conclusion

A conditional CT contributed to retention of urban, out of school, unemployed young women in Cape Town in a SRH empowerment program which led to self-determination, and improved prospects for employment.

Keywords

Implementation science research

Adolescent

Sexual, HIV and reproductive health

Multiphase

Mixed Methods

Experimental

Cash-plus interventions

Cash transfer

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I, together with my primary supervisor Prof Linda Gail Bekker, conceived the presented research idea. I wrote the research protocol; performed fidelity testing and interviews during implementation; undertook data management and analysis; and wrote the monograph presented here.

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Dedication

I dedicate this work to the three people who have been impacted the most by my decision to do this PhD.

I dedicate it to my S'thandwa, my loving and supportive life partner, **Tebogo Naledi**. Ke leboga lerato Mothlaping. Thank you for loving me through this PhD journey, patiently holding space for me, encouraging me and, making sure I always had all I needed.

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Glossary of terms

CT	Cash Transfer
AGYW	Adolescent girls and young women
ARV	Antiretrovirals
BCW	Behaviour Change Wheel
BI	Behavioural Intervention
Cash-plus	Cash-plus interventions are interventions that aim to support the building of human capabilities by augmenting the "income effects" of cash with additional human development components such as behaviour change and addressing supply-side interventions to improve the quality of services.[19]
C+C	Cash plus care
CCT	Conditional Cash Transfer
CM	Contingency Management
CSE	Comprehensive Sexuality Education
CT	Cash Transfer
DREAMS	Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe, a PEPFAR programme
DTHF	Desmond Tutu Health Foundation
ESA	Eastern and Southern Africa
GBV	Gender-based violence
GF	The Global Fund to Fight AIDS, TB and Malaria
HIC	High-income countries
IDI	In-depth interviews
LMIC	Low and middle-income countries
LTFU	Loss to follow up
NGO	Non-Governmental Organisation
PEPFAR	President's Emergency Plan for AIDS Relief

Quid pro quo	Giving something in return of something else
RCT	Randomised controlled trial
RE-AIM	The Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) Framework
SANAC	The South African Aids Council
SBCC	Social and Behaviour Change Communication
SCT	Social Cognitive Theory
SDT	Self Determination Theory
SRH	Sexual and reproductive health
STI	Sexually transmitted infections
TDF	Theoretical Domain Framework
UCT	Unconditional cash transfer
WCG:H	Western Cape Government: Health
WoW	Women of Worth is an empowerment, education and skills transfer programme for young adult (19–24-year-old) women developed by the Desmond Tutu Health Foundation.
YFHS	Youth-Friendly Health Services

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Prologue

This monograph **includes a published paper** titled “Women of Worth: the impact of a cash plus intervention to enhance attendance and reduce sexual health risks for young women in Cape Town, South Africa” attached here for your convenience. This paper **reports on one of the objectives of this research**. This paper was received on 28 June 2021 by the Journal of International AIDS Society, accepted on 12 May 2022 and published.

This **PhD is written in a form of a monograph**, and I have **included this published paper** in chapters of the PhD discussing research methods (Chapter 6), research findings (Chapter 7), discussions (Chapter 8) and conclusions (Chapter 9) **as it relates to Objective 3 of the research** “To determine the effectiveness of conditional cash transfers in reducing HIV infection and moderating biological, behavioural and socio-demographic risk factors in women receiving the Women of Worth empowerment programme intervention”. The contents of this published paper are integrated into the monograph and do not stand independently in a specific chapter.

I **attach a letter from my co-authors in Appendix A**, that as per Rule 6.3, this published research paper is part of my original work for her PhD and that I have conceived the presented research idea for the PhD with my Primary supervisor Prof Linda Gail Bekker (LGB). They confirm that I authored the research protocol for the evaluation that was in addition to the broader proposal for the implementation of the Women of Worth written by LGB. I developed the evaluation tools, performed fidelity testing, and conducted in-depth interviews during implementation. I undertook data management and analysis; and wrote the published manuscript and the monograph presented here. I have acknowledged and outlined the role my co-authors played in the publication in the Acknowledgements section of this monograph.

The reader can read the **full published paper attached as Appendix B**.

Chapter 1: Study Overview

This research **evaluates the implementation of the Women of Worth empowerment programme** that was a community-based combination SRH/HIV prevention programme where a cash transfer (CT) of ZAR300 (USD22) was given to enrolled individuals conditional on completion of 12 SRH/HIV empowerment skills-building sessions and where youth-friendly health services (YFHS) were promoted and made accessible. This research also **evaluates the effectiveness of the CT component of the Women of Worth empowerment programme** in reducing HIV infection and moderating biological, behavioural and socio-demographic risk factors in programme recipients. This programme was conducted in two health sub-districts in Cape Town, Western Cape, South Africa and directed at ten thousand young women aged 19-24 years.

The Women of Worth empowerment programme was one of two unique CT programmes for young women 19-24 years in two provinces and was developed to test the feasibility and gain lessons to inform future programming for young women and girls in South Africa. In Cape Town, the Women of Worth empowerment programme was designed and implemented by the Desmond Tutu Health Foundation (DTHF) and **nested within their three-year Zimele programme run in conjunction with the Provincial Health Department of the Western Cape**. The Zimele programme was the Western Cape chapter of the national adolescent girls and young women (AGYW) HIV programme **supported by the South African National Aids Council** responsible for the multisectoral response to HIV, TB and STIs in South Africa and **funded by the Global Fund (GF) to fight AIDS, TB and Malaria from 2016-2019.**

1.1 Research problem

AGYW in South Africa bear the brunt of HIV. Even though significant progress has been made in the region and globally in addressing HIV in adults and young children, **progress for AGYW is lagging**. Young women (19-24 years) in South Africa are a particularly vulnerable group; many have not completed high school, are often unemployed and are 3,5 times more likely to have HIV than their male counterparts of the same age.[1,2]

1.2 Background to the research problem

The African **population of young people is larger and growing faster than it has ever been** in history and young people experience a disproportionate burden of disease compared to children and adults. Yet, the developmental life changes as young people transition into adulthood are amenable to social contexts. This is an **opportunity for public health interventions that can foster health-promoting behaviours** for population impact.

The young women age group (19-24 years) presents the **final opportunity to establish health- promoting behaviours that would result in health and a more stable transition into adulthood** and healthy future generations.[3]

The disproportionate HIV vulnerability in young women remains intractable and is **driven by high levels of health inequities, structural determinants and gender inequalities** in Eastern and Southern Africa (ESA).[4,5] Interventions that address structural and social determinants of health such as education completion, employment, gender norms and removal of barriers to health care access in young women have the potential to reduce HIV vulnerability and improve other health outcomes in young women.[6]

1.3 Literature review

Behaviour change that is sustainable and leads to sustainable social change is complex and has multiple determinants. This research **explores theoretical concepts of developing an evidence-based behaviour change intervention** that could be applied to addressing the research problem and reducing HIV vulnerability in young women aged 19-24 years in South Africa and to inform the design of the Women of Worth empowerment programme.

According to social cognitive theory (SCT), behaviour change is regulated by the interdependence of **personal, behavioural and structural factors**.[7] Self-determination theory (SDT) asserts that all humans are naturally inclined to **autonomy, learning, mastery and connection with others** and will thus be intrinsically motivated to act to meet these objectives.[8] Behavioural economics posits that **people do not always behave in rational ways** that advance their long-term and thus need nudges to direct their behaviour.[9] The Behaviour Change Wheel (BCW) and Theoretical Domains Framework (TDF) **provide a guide on how to design interventions that would address these determinants** of behaviour.[10,11]

The **evidence for effective interventions that reduce HIV vulnerability** in young women shows that due to the complexity of the determinants of HIV, complex multi-layered programs that include **structural, biological and behavioural interventions are needed** to effectively address the key drivers of HIV vulnerability. The **evidence for the effectiveness of complex interventions** (of which the Women of Worth empowerment programme is an example) for reducing HIV vulnerability in young women **in the real world is limited and weak**. This is due to the complexity of implementation and evaluation methodologies. More research is needed to understand these complexities for an effective response.

CTs are an example of a structural intervention where individuals or households are given a financial contribution to reduce poverty, inequality and/or incentivise a particular action or

behaviour. Cash-plus interventions build human capabilities by augmenting the "income effects" of the CT with additional human development components such as behaviour change and addressing supply-side interventions to improve the quality of services.[12]

The scoping review of the effectiveness of CT interventions and their pathways of effect to reduce HIV vulnerability in AGYW in ESA revealed limited evidence for CTs only reducing HIV infections. There is however emerging **promising evidence for cash-plus interventions** due to the potential of human capability development interventions that augment the CT. This scoping review also found **limited evidence and understanding of pathways of effect for CT interventions**.

1.4 The conceptual framework for the design and evaluation of the Women of Worth programme

The research conceptual framework presents assumptions and theoretical descriptions of mechanisms of action and causal pathways of how the Women of Worth cash-plus empowerment programme would work in a real-world setting to reduce HIV vulnerability with the primary outcome being changes in HIV prevalence.

The Women of Worth programme was designed and evaluated based on theoretical frameworks of SCT, SDT and behavioural economics that define the determinants of behaviour; and the BCW and TDF models that define the interventions to respond to these determinants and the evidence for effective implementation of interventions that reduce HIV vulnerability in AGYW.

The assumptions and mechanisms of action tested were that:

1. Local contextual factors will likely **require adaptive research methods** to ensure efficient recruitment, retention and programme delivery.
2. The CT given conditionally on the attendance of 12 evidence-based facilitator-led Women of Worth empowerment programme sessions would provide **financial incentives and reduce barriers for sustained participation** and ensure recruitment and retention in the programme.
3. **Once sustained engagement was attained**, the Women of Worth empowerment programme sessions would increase intermediate outcomes of **knowledge, skills, competencies and capabilities for health literacy (SRH/HIV/GBV/Mental well-being), healthy relationships, career planning and job seeking, and active citizenry**.

4. The Women of Worth empowerment sessions implemented **using empathetic engagement approaches and supported by a community of peers** would promote mastery, self-reflection, self-responsibility, **agency and autonomy** for SRH.

5. The community of peers would provide **social support and sense a of sisterhood** that would facilitate sustained engagement in the programme and programme impact.

6. The promotion of health services during sessions and the availability of fixed and mobile youth-friendly services as programme inputs would **increase the opportunity for uptake of SRH services** as an intermediate outcome.

These assumptions and mechanisms of action were tested using a theory of behaviour change model for the Women of Worth empowerment programme that follows a programme logic to depict the theoretical causal pathway for intervention and show the relationship between the inputs into the programme, the expected outputs, and intermediate and final outcomes and informs the evaluation design.

Change in HIV prevalence was the primary outcomes of this research and based on the study sample size this research would elucidate an additional reduction in HIV incidence, as a result of the CT, of between 5-7.5% compared to not receiving the CT.

1.5 Research aims and objectives.

This research aims to **evaluate the implementation of the Women of Worth empowerment programme and the effectiveness of the CT component** of the programme in reducing HIV infection and moderating biological, behavioural and socio-demographic risk factors **to reduce HIV vulnerability in young women aged 19-24 years in Cape Town, South Africa**. The primary outcome for evaluating CT effectiveness was HIV incidence and secondary outcomes were SRH behaviours and employment.

The proposed **theory of change model** was **evaluated using multi-phase, experimental mixed methods hybrid type I study design** to fulfil both the effectiveness and implementation objectives of this research.[13,14] This study was conducted between May 2017 and December 2019.

The specific objectives of the evaluation were:

Specific Objective 1: To determine implementation factors that promote scaling up of sustained engagement of young women aged 19-24 years in the Women of Worth empowerment programme.

Specific Objective 2: To determine implementation fidelity of the Women of Worth empowerment programme intervention.

Specific Objective 3: To determine the effectiveness of conditional cash transfers (CCTs) in reducing HIV infection and moderating biological, behavioural and socio-demographic risk factors in women receiving the Women of Worth empowerment programme intervention.

Specific Objective 4: To determine the pathways of effect for the Women of Worth empowerment programme intervention effect including the CTs in reducing HIV vulnerability in young women aged 19 -24 years in Cape Town, South Africa.

1.6 Research design & methods

The Women of Worth empowerment programme evaluation study had **four components.**

1) **A randomised component that had two phases**; a pilot phase which was called Phase 1a (1000 intended participants required to attend BI monthly) and the main randomised component, the post-modification Phase 1b (4000 intended participants in which the BI was attended weekly) where participants were randomised 1:1 in the "care" and the "care plus cash" arms to test the effectiveness of the CT component of Women of Worth empowerment programme to reduce HIV vulnerability

2) The **open-label component of the programme called Phase 2** (5000 intended participants, BI weekly) to demonstrate scale-up that only included a "care plus cash arm" and had no randomisation. A follow-up self-administered questionnaire was completed between the 11th and the 12th session on a digital tablet. To assess longer-term follow-up, a sub-sample of 1000 participants who had attended at least one session at least 6 months before the end of the study on 31 December 2019 was invited reaching a median of 15 months of follow-up after the intervention had been removed.

3) **Qualitative and quantitative research methods were used to determine the pathways of effectiveness** for the intervention.

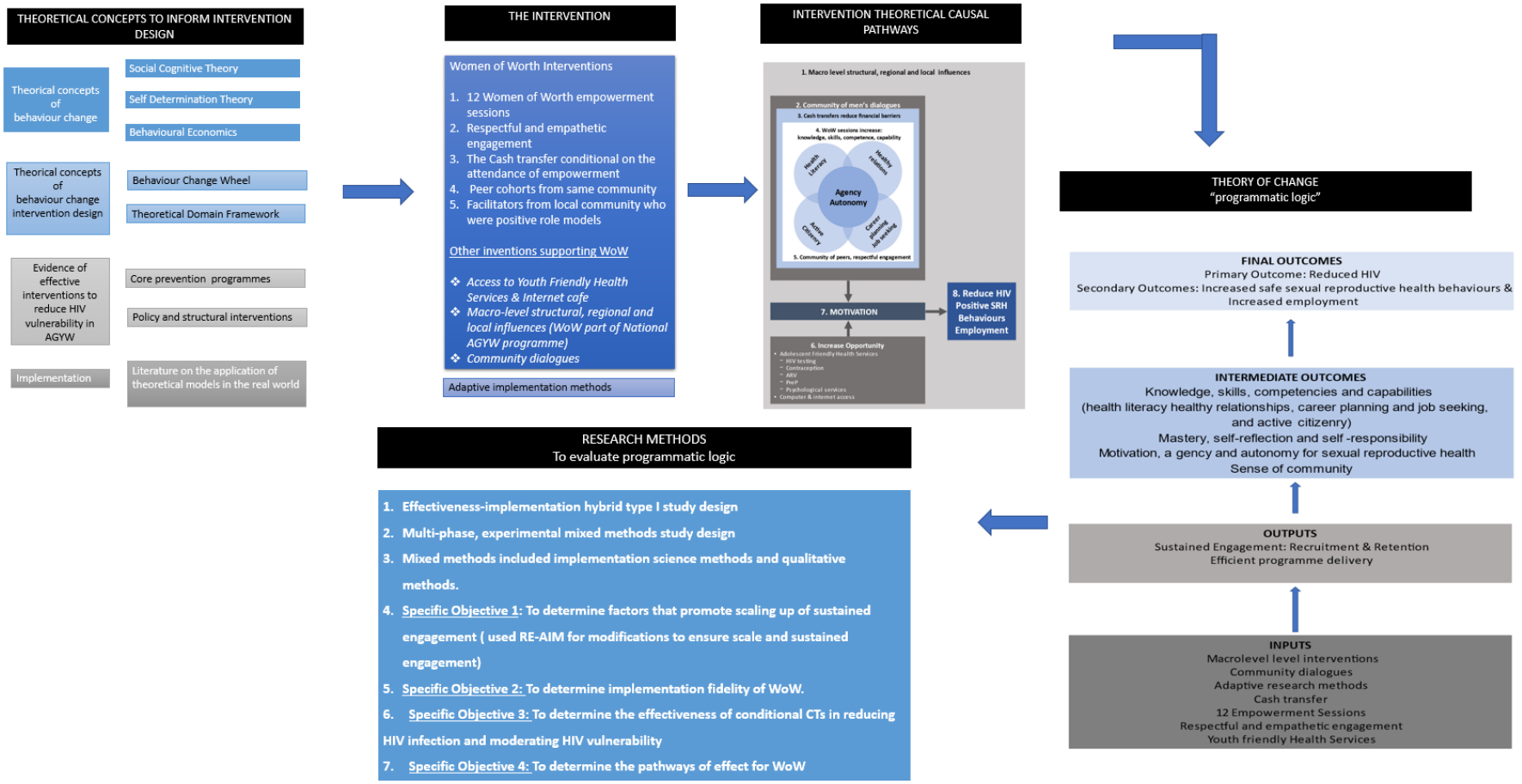
4) **Implementation science methods** were used to ensure sustained engagement and evaluate implementation fidelity. This included the use of the RE-AIM Framework, an implementation science tool that is recommended to plan and evaluate successful uptake of interventions in the real world. The RE-AIM Framework was used to guide study adaptations to ensure sustained engagement in the Women of Worth empowerment programme.

1.7 Graphic summary of conceptual framework for WoW design and evaluation

Figure 1 below summarises the conceptual framework for the WoW intervention design and its evaluation. This summary is intended to assist the reader to understand how the theoretical concepts of behaviour change and the evidence for the implementation of effective interventions to reduce HIV vulnerability in AGYW have informed the design of the WoW intervention and how it was evaluated.

Theoretical concepts for behaviour change and the evidence for the effective implementation of interventions to reduce HIV vulnerability in AGYW informed the design of the intervention, Women of Worth empowerment programme and its evaluation methods. Based on the literature, theoretical causal pathways of the intervention are described. A theory of change that is a planning and evaluation method provides a working model for testing the research conceptual framework and providing a programmatic logic that can show how an intervention worked in the real world. The research methods evaluated the Women of Worth empowerment programme based on the programmatic logic.

Figure 1: Graphic representation of the conceptual framework for WoW design and evaluation



1.8 Delineation

This research was limited to evaluating the implementation of the Women of Worth empowerment programme and the influence of local-level implementation factors and the evaluation of the effectiveness of the CT component on individual behaviour change. For completeness's sake, the broader multi-dimensional and structural factors where the Women of Worth empowerment programme is nested are described. **The evaluation of the impact of these complex contextual factors is, however, beyond the scope of this research**.

1.9 Summary findings

A key finding of this study is that the transfer of a small CT is very effective to seize and hold young women's attention sufficiently for them to get the full benefit of a prevention intervention that involves several sessions over time. Young women who received the CT were up to **60-fold more likely to remain in the programme.** The context of deprivation of participants influenced programme participation, decision-making and relationships with family.

Overall, **the Women of Worth empowerment programme was implemented with acceptable fidelity** however **adaptative research methods were essential for ensuring sustained programme** exposure to provide the best possibility for the programme to have an effect. Sustained engagement was improved with weekly and flexible programming and the **CT was a critical requirement for demand creation, sustained engagement in the programme and ensuring financial independence**.

Due to the high loss to follow-up in the "care" group, estimates for the effectiveness of the CT were pooled for both groups. **Those retained in both study arms (mainly those from the C+C arm) increased more than 3-fold their employment status immediately and after more than a year** post the Women of Worth empowerment programme intervention. This significant and sustained increase in employment is **an important social determinant of HIV vulnerability in the context of very high youth unemployment.** Even though there is no documented evidence of employment resulting in HIV prevention in the population of interest, there is, however, a positive association between employment and positive HIV and other health outcomes. The impact on **risky sex behaviours in this research was however mixed and found beneficial for certain outcomes**. This was however **not found to be durable** when the intervention was removed.

The pathway of effect for the programme appeared to be through the **building of self-determination that ignited agency, autonomy and gaining mastery in safe sex behaviours and seeking livelihoods supported by a social network and resources**. The participants' CTs provided young women financial independence and were shared with family

and improved family relationships as young women were able to fulfil family and societal financial obligations. **The durability of this effect was not tested.**

Even though the individual effect of the CT component of the Women of Worth empowerment programme on reducing HIV vulnerability remains uncertain due to the high attrition in the "care" group; this study adds to the growing evidence of the effectiveness of "cash-plus" interventions in urban, low-income settings in relation to young South African women. This cash-plus programme may contribute towards **addressing the intractable structural determinants that drive HIV vulnerability in young women.** It may also improve motivation and agency for **safe transitioning into adulthood for this population group that is beyond HIV and may also affect family members** of participants since participants had a great sense of family responsibility for forgoing their own needs.

1.10 Implications for policy and programming

These findings imply that **cash should be seriously considered to ensure sustained engagement** of young women in other developmental and health-promoting interventions in settings similar to the Women of Worth empowerment programme.

Cash-plus interventions in community settings should also use **adaptive implementation methods to ensure contextually responsive** interventions with the flexibility to promote uptake and sustainable engagement.

The **sustained increase in employment for more than a year** after the intervention and enhanced **self-determination** in this vulnerable population of young women is a compelling reason to consider cash-plus interventions such as the Women of Worth empowerment programme as a national programme to reduce HIV vulnerability in similar young women cohorts.

Longer-term follow-up to test the impact of sustained employment and self-determination are recommended together with cost-effectiveness analysis that also considers social determinants to account for impacts that may go beyond HIV and impact families and communities.

1.10 Chapter outline

The outline of the chapters that follow is described briefly in Table 1.

Table 1: Chapter Outline

Chapter Two: Research Problem	Defining the research problem and provides the background to the focus and context of this research.
Chapter Three: Literature review	Outlines a theoretical framework for behaviour change and effective interventions for HIV prevention in the real world in young women in Eastern and Southern Africa.
Chapter Four: The Women of Worth Conceptual Framework	Defines the research conceptual framework and the theory of change that is a working model for testing this theory.
Chapter Five: Scoping Review	Determining the effectiveness and pathway of effect for Cash Transfers that reduce HIV vulnerability in AGYW in Eastern and Southern Africa.
Chapter Six: Research Methods	Describing the multi-phase, experimental mixed methods study design used to evaluate the programme based on the theory of change.
Chapter Seven: Research Findings	Reporting on research findings to test the validity of the research conceptual framework.
Chapter Eight: Discussion	Interpreting and explaining findings these findings in relation to current literature and discuss the significance for knowledge and practice.
Chapter Nine: Conclusion	Highlight the research's implications for policy and programming and key contributions to the evidence base of reducing HV vulnerability of young women in Eastern and Southern Africa and recommending areas for future research.
Appendices	Supplementary materials

CHAPTER 2: Research problem

This chapter **defines the research problem and provides background to the focus** and context of this research. It situates the research within the unique opportunities the youth population bulge provides for public health interventions to impact adult health outcomes in the future. This chapter **discusses health inequality and social injustices that influence HIV vulnerability** in the transition of AGYW to adulthood in South Africa.

2.1 Unprecedented adolescent population bulge

The next few decades will record the largest ever population of young people globally and in Africa in particular.[15] This presents an opportunity for a healthy, educated, economically active youth to grow economies and contribute to a more sustainable world; or it could also be a threat to development and stability if this resource is not effectively harnessed.[3] Investment in health and social development during this critical phase could result in a triple benefit.[3,16]

The triple benefit would include:

1) the immediate direct health and well-being benefits to young people.

2) establishing lifelong patterns of healthy lifestyles such as healthy diets, physical activity and safe sexual practice into adulthood.

3) transferring these healthy lifestyles to future generations.[3]

The World Health Organization's (WHO) expanded definition of youth defines young people as being between 10–24 years of age.[17] This is roughly divided into three age groups, namely, early adolescence (10-14 years), mid to late adolescence (15-18 years), and young adulthood (19-24 years).[18] Data from the World Bank suggests that approximately 1 in 4 (1,8 billion) people are young people (10–24 years).[15] There is a high likelihood of future reductions in child mortality, mortality rates, increased access to education, safe SRH and maternal health, and delay into marriage and parenthood and these numbers are set to grow even more.[3,19]

The life course approach to health and well-being surmises that biological, behavioural and psychosocial development is influenced by life stages and is interconnected and dependent.[20] Over the last 50 years the global investment in the prevention of communicable diseases in children has increased the survival of children to become adolescents and adults.[21] Childhood foundations of good health, nutrition, educational attainment and healthy family and societal relationships are essential in establishing health and social behaviours that prepare young adults for health-promoting lifestyles into adulthood and future generations.[6]

Young people aged 19-24 years mature from late adolescence into adulthood and develop competencies of self-regulation, future orientation and responsibility, a stronger sense of

independence, more serious relationships, compassion for others and an interest in social and cultural connections.[6] This is accompanied by an expectation of stable transition with increasing adoption of adult roles such as parenting, career development and citizenship e.g. voting.[3,6,22]

As adolescents and young people establish their identity, connection to others, and set personal boundaries; they may exhibit increased risk-taking behaviour such as risky sexual behaviour and alcohol and drug use as a way of gaining peer acceptance or avoiding social exclusion.[3,6,23] Unfavourable health outcomes may occur with vulnerabilities such as poor health literacy, unsupportive parents and caregivers, unfavourable social determinants and inaccessible and/or unfriendly health services.[3,24] Similarly, during this transitional developmental stage youth behaviours are amenable to social contexts presenting an opportunity for public health interventions and research for population impact into future generations.[3]

This research concentrates on young women, **19-24 years old in their final stages of transitioning to adulthood** thus presenting the **final chance to establish health-promoting behaviours that would result in health and a stable transition into adulthood** and healthier future generations.[3]

2.2 Burden of disease in youth

Health risks and vulnerabilities that adolescents and young people incur due to their transitional state into adulthood have resulted in the disproportionate burden of HIV, TB, other infections, malnutrition, trauma and violence, mental health disorders and other non-communicable diseases (NCDs) mostly in low and middle-income countries (LMIC) that are home to nearly 90% of the young people.[3,6] This is a risk for future generations as at least 70% of premature adult mortality is a result of unhealthy lifestyles established in the adolescence period.[19]

The WHO reports that over 1.5 million youth aged 10-24 years died in 2019 translating to approximately 5000 deaths per day.[25] Adolescents aged 10-14 years have the lowest mortality rates compared to adolescents and young people aged 15-24 years with mortality rates increasing by age.[25,26]

According to the WHO the top five causes of death in young people, differ by sex, age, and region, and can be categorised as:

1. **Trauma and violence** are more prominent driving factors for death in males and SRH issues in females for those aged 20-24 years.[26] In young men road traffic injuries, self-harm, interpersonal violence, TB and drowning are among the top 5 causes of death.[27]

2. **HIV** is a significant cause of death in young women.[27]

3. **Risks for communicable and NCDs** (including mental health) and injuries in youth are highest in LMICs and affect the general health and well-being of adolescents and young people.[3]

4. **Tobacco use** in adolescence is an important risk factor for adult tobacco dependence and cardiovascular disease in adulthood.[25] Similarly, nutrition, micronutrient deficiencies and malnutrition remain a challenge in youth with iron deficiency anaemia, obesity and limited physical activity have consequences for adulthood and are particularly prevalent in young women in LMICs.[25]

5. **Alcohol and substance use** in early adolescence is associated with increased SRH risks, substance dependence and other mental health disorders that can persist to adulthood.[25] Alcohol use has remained the leading risk factor for young men's mortality since 1990 and has also remained the 4th leading risk for death in young women.[27]

2.2.1 Sexual reproductive health (SRH) in youth

Unsafe sex is the leading risk in young women in the world and has increased significantly over time, increasing from 7th place in 1990.[27] The period of adolescence is a critical phase in the life course where transition changes lay the foundation for development and behaviour in the adult life stage.[3,6,16,28] Social and structural factors influence the onset of puberty and sexual activity and related sexual reproductive behaviours resulting in STIs, unintended pregnancies, and HIV vulnerability.

Menarche: The age of menarche (first menstruation) is a convenient measure of puberty and has reduced from 17 years about 200 years ago to 13 years in the 1940s and has now plateaued.[29,30] This change is related to genetic factors, the childhood foundations of improving survival, health status and social contexts of young girls over time.[20,24,30] The global downward trend in the age of the onset of menarche differs most significantly by wealth, and urban or rural residence with poorer and rural adolescent girls starting menarche later than urban and wealthier girls.[31] Social stressors such as family disruptions have also been associated with early puberty.[30] More recently this downward trend in menarche age may be reduced further due to obesity and other environmental factors that increase endocrine-disrupting chemicals in the body that imitate, obstruct or interfere with the hormones of the endocrine system.[29]

Sexual debut: Early menarche in girls is associated with a precocious interest in sexual activity and the onset of sexual debut (<15 years), early marriage and low education attainment.[32] In a survey of 34 countries in Africa, sexual debut for adolescent girls was median of 16 years and 17 years for adolescent boys.[33]

The age of sexual debut differs by country and has increased over time in 30 out of the 43 countries that were researched.[34] This is likely subsequent to global delayed childbearing and marriage with changing cultural norms, improving gender equality, economic development and education particularly in high-income countries (HIC).[34,35] Early onset of sexual debut is also associated with low income, living in rural areas and female-headed households.[33] Improved household wealth and educational attainment is associated with delayed sexual debut among adolescent girls but have an opposite association with adolescent boys.[33] Adolescent boys tend to have sexual activity earlier than adolescent girls.[35] In South Africa, nearly 1 in 5 (19.5%) adolescent boys had their sexual debut before 15 years compared to 7.6% of adolescent girls.[36] In low-income countries, adolescent boys' sexual activity also occurs outside of marriage compared to that of adolescent girls which is sometimes within early marriage.[35]

Early onset of sexual debut in adolescent girls in low-income contexts with patriarchal norms and power imbalances between men and women; is associated with forced sex, sexual coercion, sex with older male partners and sex in exchange for food, goods and money.[3,6,35,37] Adolescent girls in heterosexual relationships also tend to have intergenerational sexual partners and greater odds of HIV.[35,38] In South Africa, 35.8% of adolescent girls aged 15-19 years had a sexual partner 5 years or older than them compared to only 1.5% of their male peers.[36] Globally, 12 million adolescent girls are married before 18 years - prematurely accelerating their transition into adulthood.[39]

Adolescent Pregnancy: The biologically immature reproductive system and immune system in adolescent girls increases poor outcomes during pregnancy and childbirth and increases vulnerability to STIs and HIV.[35]

The WHO reports that 12 million adolescent girls give birth each year globally with 10 million of these unintended pregnancies resulting in complications during pregnancy and childbirth.[28,40] Unintended pregnancies in adolescence are associated with poor physical health outcomes, STIs and HIV, stigma, low educational attainment and poverty.[3,6,40,41] This is particularly the case in low-income countries and those with high gender inequality.[35] Eastern Africa has the highest rate of adolescent pregnancy (21.5%) followed by Southern Africa (20,4%).[42] In Sub-Saharan Africa (SSA) 50% of rural AGYW are pregnant before their 18th birthday compared to 42% in urban areas.[43]

Sexually transmitted infections: STIs are endemic globally due to their transmission efficiency compared to HIV.[44,45] It is estimated that there are over 1 million new STIs per day with LMICs and women disproportionately affected.[44] SRH-related issues drive the disability-adjusted life years (DALYs) in the Sub Saharan region. More than half of the DALYs for STIs in the world were experienced in this region.[46] A pre-exposure prophylaxis (PreP) study in

Southern Africa showed that 29% of HIV-negative sexually active AGYW had a sexually transmitted disease at baseline.[47] Rates of sexually transmitted infections are highest in young women and men aged 20-24 years compared to younger adolescent girls.[37,48] A study of six (6) South African districts including Cape Town found a disproportionate burden on young women where STI prevalence was 6.5% in adolescent girls compared to 16.1% in young women.[49] Multiple sexual partners are associated with STIs with adolescent boys and young men reporting two (2) to three (3) times more sexual partners than women.[35]

Contraception: Preventing unintended pregnancies reduces pregnancy-related risks and death in young people and ensures increased school completion and improved prospects for employment and livelihoods.[3,6,40] Youth are reported to have the lowest rates of contraception knowledge and use.[50] More than half of adolescent girls especially in Africa do not have access to SRH services.[28]

Married adolescent girls even though they do not want to have children have lower contraception use rates than unmarried adolescent girls even in ESA.[37,41] In South Africa, most pregnancies were unintended in adolescent girls (90%) and young women (79%) suggesting a high unmet need for contraception.[51] When young people have access they do not use contraception during their first sexual encounter and do not use it consistently undermining its preventative potential.[37,50]

Condom use is an important intervention to prevent pregnancy, STIs and HIV and is associated with increased educational attainment in AGYW in ESA.[41,52,53] Men reported male condom use more frequently, presumably reporting using male condoms because male condoms are more in male control than female. A South African survey reported that adolescent boys and young men used condoms more than AGYW (67.7% vs 49.8%).[36] Poorer young women were also less likely to negotiate condom use than wealthier young women.[41]

2.3 HIV vulnerability of adolescent girls and young women

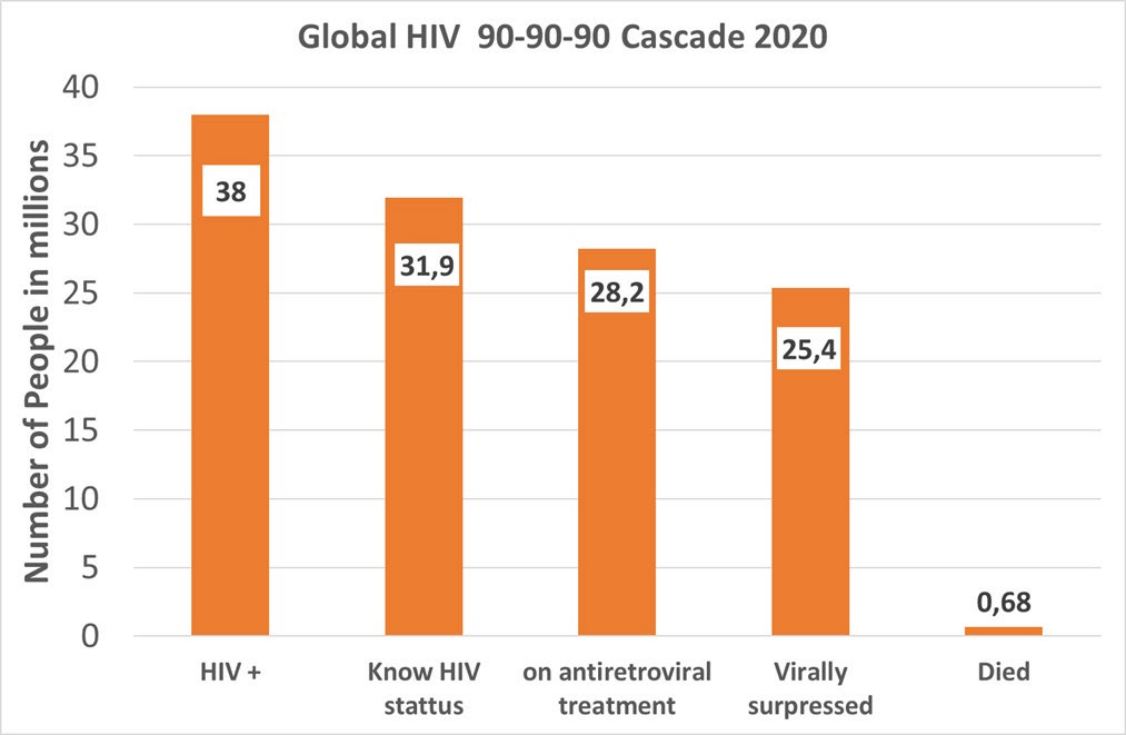
The world is far off the AGYW United Nations (UN) 2016 political declaration on ending AIDS global target of 100 000 new HIV infections in AGYW by 2020.[54] The ESA region, alone, accounted for 210 000 new infections amongst AGYW in 2019[55], with this group, aged 15-24 years, remaining disproportionately affected by HIV.[56]

2.3.1 The disproportionate burden of HIV in Eastern and Southern Africa

Globally, 79.3 million people have been infected with HIV since the epidemic started four decades ago.[57] In 2021, worldwide 1.5 million people were reported to have new HIV infections though these reduced by 52% since 1997 at the height of the epidemic and by 23% since 2010.[41,57]

Figure 2 shows that in 2020; 38 million people were living with HIV; 84% (31.9 million) of them knew their HIV status; 28.2 million people (74%) were on antiretroviral therapy (ART), (25.4 million) 90% of them were virally suppressed and 680 000 died. [41,57]

Figure 2: Figure :Global HIV 90-90-90 Cascade as of 2020[41,57]



The Eastern and Southern African region is home to more than half of the people living with HIV (20.6 million) and remains heavily burdened by HIV.[57] The region with the second highest burden is Asia and the Pacific with 5.8 million(15%) people living with HIV.[57] Rates of new infections in Eastern Europe, Central Asia, the Middle East, North Africa and Latin America are increasing and this is of great global concern.[57] The concern is particularly grave in the context of the war in Ukraine.

In the last decade, the Eastern and Southern African region has seen a 44% reduction in AIDS-related deaths and a 38% reduction in new HIV infections which is very encouraging.[41,53] In ESA 72% of people living with HIV are on treatment and 65% are virally suppressed.[41]

2.3.2 HIV burden in AGYW in Eastern and Southern Africa

The disproportionate HIV burden on AGYW is a strong rationale for the public health focus of this group of the population.

Currently, 1.74 million adolescents living with HIV reside in ESA; this is 60% of the global burden on adolescents.[58] Every week in 2021, there were 4000 new infections in adults and

children; half of them were in women and about 1 in 3 were in young people aged 15-24 years.[59]

AGYW, aged 15–24 years, have double the risk of HIV compared to their male counterparts.[39,56] Women and girls accounted for about half of all new HIV infections in 2020 in the world, and in ESA, this was much higher at about two-thirds of all new HIV infections even though they only comprise 10% of the population.[2,39,41,43,57,60] HIV incidence peaks in 20-24-year-old women and peaks at 25-29 years for men.[61] The burden of infection is also much higher in young women than in adolescent girls.[61] Globally, the majority (90%) of AIDS-related deaths among adolescents and young people were in SSA.[43]

UNAIDS reports that even though risky SRH behaviours are higher in men, AGYW remain disproportionately affected by HIV. In ESA, there is a 3 to 7 ratio of new HIV infections in males and females aged 15-24 years.[43] Adolescent boys and young men tend to have an earlier sexual debut, have multiple partners but they are more likely to use condoms more often than AGYW and have higher access to ART.[32,33,62] In women, increased education and income is associated with a reduced number of sexual partners whereas, in men, increased income is associated with increased sexual partners possibly as a way of demonstrating virility, another important process associated with seeking a sexual mate.[35,63]

Unlike the global average shown in Figure 2 above, HIV outcomes for AGYW in ESA are poor and worse than for adults despite the availability of life-saving treatment.[59] HIV testing in young women in ESA is disproportionately lower in rural women than urban women.[43] Just under two-thirds (64.8%) AGYW who were HIV positive know their HIV status compared to only 24.1% in HIV positive boys and young men.[36]

2.3.3 HIV burden in AGYW in South Africa

South Africa, the focus of this research, has the unenviable position as the global epicentre of the HIV epidemic. Just under 1 in 5 of all people living with HIV in the world and 20% of people on ART are in South Africa.[2]

Over a third (38.0%) of all new infections in South Africa were in young people.[64] The HIV burden is highest in young women aged 20-24; being three times higher than in adolescents aged 15-19 years.[36] In South Africa, HIV incidence peaks at 19-year-old women (2,7%); and this is three times higher than HIV incidence in 15-year-old adolescent girls (0,85%).[65] Young women (19-24 years) in South Africa are a particularly vulnerable group; they are 3,5 times more likely to have HIV than their male counterparts of the same age.[1,2]

In South Africa, 58.8% of youth 15-24 years had tested for HIV.[36] HIV testing was higher in adults (85.8% in people aged 25-49 years vs 74.0% in people aged 15-24 years) and higher

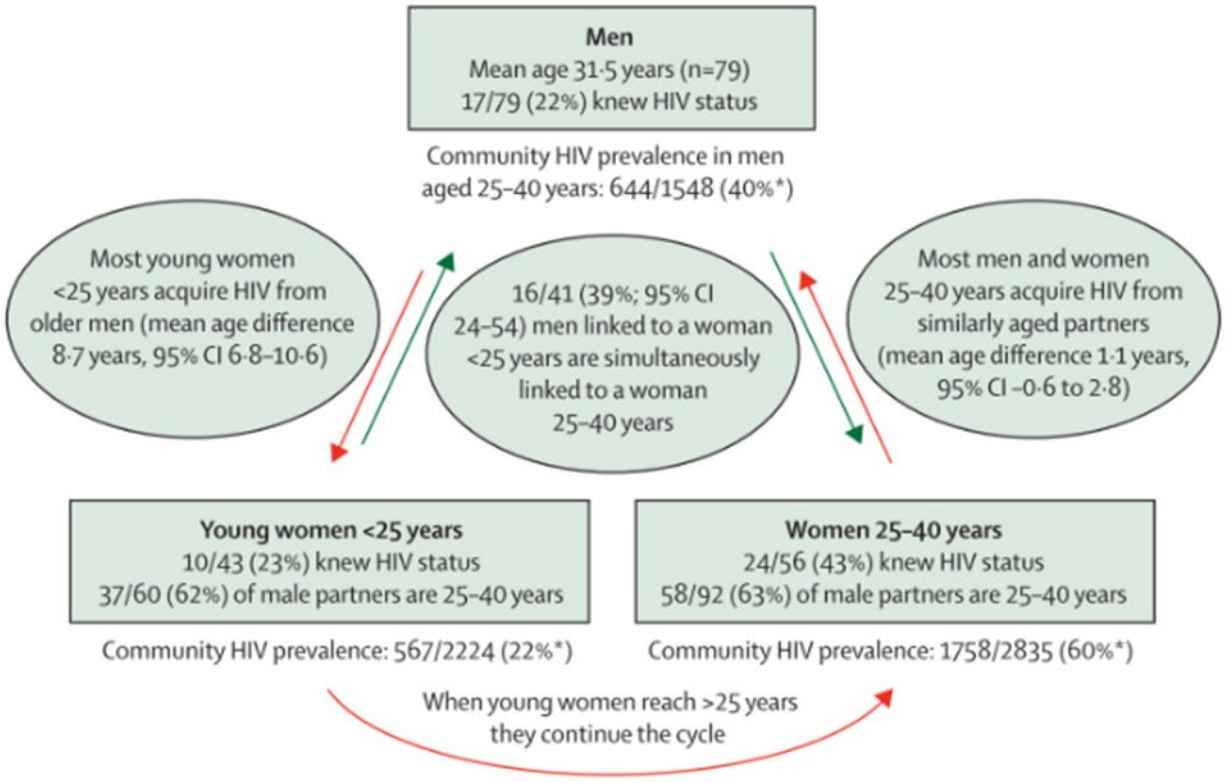
in AGYW 15-24 years than in adolescent boys and young men (76.4% female vs 68.3%male).[66]

The leading cause of death among AGYW in South Africa is HIV.[67,68] In a South African national survey, HIV outcomes for youth 15-24 years, access to ART in particular, was lower for young people compared to adults and within the youth; men had more access than women.[66] Only about half (51.7%) of youth aged 15-24 years were on treatment compared to 70.5% in the age group 25-49% and more males aged 15-24 years were on ART than females of the same age (58.8% males vs 49.1%females).[66] Viral suppression outcomes were also superior in adults and AGYW, though the difference was not as stark as for access to ART and HIV testing.[66]

2.3.4 HIV infection cycle in South Africa

Figure 3 shows the phenomenon in the HIV infection cycle in South Africa from de Oliveira and colleagues[69]. It shows that in South Africa AGYW acquire HIV from men who are on average 8,7 years older than them.[69] Men acquire HIV during adulthood from women who are infected with HIV of a similar age. Adult men who are HIV positive are shown to be less likely to know their HIV status or be on treatment. These men who are HIV-positive subsequently enter sexual relationships with AGYW and re-initiate the HIV cycle.

Figure 3: Sexual networks presentation for HIV acquisition in AGYW[69]



2.4 Health inequities in Eastern and Southern Africa

The Eastern and Southern African region (Figure 4) consists of 26 countries and has a total population of 700 million people, which make up 9% of the world's population. This is approximately two-thirds (63.6%) of the population of SSA.[70] Almost half the population of the this region is under 18 years and provides the opportunity for development and laying strong foundations into adulthood for a prosperous future region.[70]

However, SSA, particularly ESA is a region with high population growth and rapid urbanisation with the world's worst regional adolescent and young people health profiles.[71] [26] The ESA region even though laden with natural resources, precious metals, tea, coffee and others, has the lowest human capital index (a measure of the impact of health and education on the productivity of the next generation of workers) in the world.[72,73] For example, A child born in SSA can expect to be only 58 % as productive as a child in Europe and Central Asia.[73]

A review of the global burden of disease shows a disproportionate reduction in the global burden in the last three decades. Eastern and Southern African youth suffer high mortality from maternal and infectious diseases, high tobacco and alcohol use, obesity and have the lowest rates of physical activity in LMICs, as well as subsequent high risks for later life non-communicable diseases.[71] More than 70% of deaths in children and youth aged 5-24 years were reported to be in SSA, Central and Southern Asia.[26] A 5-year-old child born in SSA is six times more likely to die before they are 25 years old than a child in North America and Europe.[27]

The 20:20 ratio shows how much richer the top 20% of the ESA population is than the bottom 20% of that population. UNAIDS has shown that after controlling for potential confounders of education status, rates of gender inequality and income per capita; a one-point increase in the 20:20 ratio is associated with a two-point increase in HIV prevalence.[74] Six of the ten countries with the highest income inequality are in Southern Africa.[75] It is therefore not surprising that ESA has the highest HIV burden globally.[57]

Figure 4: Eastern and Southern Africa[76]

2.5 Social injustice's role in driving health inequities

2.5.1 Social determinants

UNAIDS has recognised the importance of social justice and addressing social determinants of poverty, education, employment and gender inequalities in ending HIV.[41,77]

Social Determinants of Health are defined as the conditions in which people are born, grow, live, work and age that are influenced by access to power, money and resources and directly impact health disparities amongst people.[78] They include economic stability, education access and quality, health care access and quality, neighbourhoods and the built environment, and social and community context.[79]

Social determinants result in a disproportionate burden of disease in young people where over half of them live in high disease burden countries plagued with HIV, TB, other

infections, malnutrition, trauma and violence, mental health disorders and other NCDs. [3] The highest burden of mortality in young people is found in low and middle-income regions that are home to nearly 90% of the young people.[6] The Eastern and Southern African region was reported to have the worst adolescent health profiles globally.[3,25]

In ESA, the normal transitions to adulthood occurring in socio-economically constrained environments amplify social problems and affect the development of adolescents.[23] The developing self-regulation, future orientation and high risk-taking behaviours of normal adolescents can be a critical risk factor in hyper-endemic contexts.[80]

Living arrangements in ESA are not health-promoting and increase HIV vulnerability. AGYW experience the brunt of these environments with low high school completion rates, high levels of poverty, unemployment, and gender inequities which impact HIV vulnerability and general well-being.[38,39,88,65,81–87]

2.5.2 Socio-economic and HIV environment in Eastern and Southern Africa

The socio-political **legacy of Eastern Africa is one of political conflicts** and current conflicts in countries such as South Sudan, Mozambique, Ethiopia, and Somalia.[89] A fragile socio-economic context of low education, employment and poor health remains a risk for development and security in the region.[70] This fragile region has also been adversely affected by the COVID-19 pandemic.[70]

Education: In ESA, even though most children (80%) are enrolled in primary school; high school completion and graduate education is a particular challenge.[90] In SSA, only 9.4% of young people were enrolled in tertiary education compared to the global average of 38%.[91]

Employment: Youth unemployment rates in the Eastern and Southern African region, are double those of adults and are similar to the global average but these estimates vary by sub-region.[92,93] Half of young people in Southern Africa are unemployed compared to 6% in Eastern Africa, highlighting the very high socio-economic risk for HIV vulnerability in Southern Africa more specifically.[92]

Rural and urban: Just over half (55%) of Africans are urbanised and this is likely to grow with ESA leading.[94] Urbanisation, however, could result in urban poverty, unemployment and isolation, especially for youth.[94,95] In the region, those living in urban informal and rural formal areas have higher HIV prevalence than those living in urban formal and rural informal residential areas.[96] Just over half (52%) of AGYW living in rural areas in ESA do not have adequate knowledge to make decisions about their health compared to 47% in urban areas.[39]

2.5.3 Socio-economic and HIV environment in South Africa

South Africa has a population of 60.1m people, 8.5% of the population in ESA.[70,75,97] The socio-political **legacy of South Africa is linked to the legacy of Apartheid.**

South Africa has the largest economy in the Eastern and Southern African region however, it is the most unequal country in the world.[70,97,98] The legacy of Apartheid epitomised by white supremacy and patriarchy has resulted in challenges of poverty, unemployment, and gender power inequalities.[98]

In South Africa, youth (15-24 years) comprise 17% (10,4 million) of the South African population.[97] Youth are still experiencing low well-being in health, safety and security, social and economic opportunities post-apartheid.[99] The disproportionate socio-economic burden of inequality is borne by young people in South Africa, especially young women.[100] This increases the risk for HIV vulnerability.

Education: Completing secondary education is protective against HIV infection in AGYW. It increases the uptake of family planning, reduces unintended pregnancies and GBV and increases financial security and independence.[59,67] In South Africa, even though post-democracy access to primary education is nearly universal and access to post-matric education has grown by 22.3% annually; it is the quality thereof that has been a challenge.[101,102] In 2015, it was reported that only 40% of learners that were in Grade 2 in 2005 completed their matric.[101]

Unemployment: Economic independence in young women is associated with fewer sexual partners, safer sex and increased condom use.[103] South Africa had the highest unemployment rate in the world with Eswatini, Botswana and Lesotho in the Southern Africa region ranking 4th, 5th and 6th respectively.[104] About a third (32,8%) of South African youth are unemployed, comprising 42,3% of all unemployed South African persons.[97,100] There are more adolescent and young women not in employment, education or training than adolescent boys and young men.[105] Youth employment and especially for women tends to be informal and temporary and not offering job security and career progression.[106] This was laid bare during the COVID-19 pandemic. In South Africa, women lost more jobs than men and were also more likely to lose their jobs permanently.[107]

Rural and urban: In South Africa, only a third 32,6% of the population live in rural areas and experience double the poverty levels of urban areas.[97,98] Due to the legacy of the discrimination of living settlements, approximately 1 in 7 households in South Africa are informal dwellings and this is higher (1 in 5) in urban areas.[108] Poverty and hunger in female-headed households are higher than in male-headed households and those classified to be of white race had the highest annual household expenditure than any other racial group while

African blacks had the lowest household expenditure in South Africa.[98,109] These inequalities between racial groups and between rural and urban dwellers have widened post-democracy.[98] The setting for this research is an urban, low-income area with a significant informal dwelling component.

Family Fragmentation: The legacy of the Apartheid migrant labour system in South Africa has caused fractured family structures where nearly half (44,2%) of female youth 15-24 years live in households without a working adult, compared to 19.8% of male youth and 18.9% of all youth 15-24 years receive social grants.[109] Fractured family structures result in weak childhood foundations of supportive family structures and present a challenge in the transition from adolescence into adulthood. Adolescents from fractured families are prone to mental health disorders (including alcohol and substance misuse) and increased sexual risk behaviours and violence.[3,110]

2.5.4 Gender inequality, gender-based violence and transactional sex

Gender and economic inequality and patriarchal gender norms, also social determinants, are associated with increased STIs and poor outcomes in AGYW.[50] This is due to low SRH/HIV knowledge, sexual coercion, multiple sexual partners, intergenerational sex, GBV and transactional sex compounded by early menarche and sexual debut driven by social determinants.[35,37]

Gender-Based Violence: UNAIDS has reported GBV as an intractable driver of the HIV epidemic with a 1.5 times increase in HIV acquisition[41] GBV is largely experienced by women as a result of gender disparities that favour men.[111] Intimate partner violence (IPV) is the second global risk factor associated with the burden of disease in young women whereas it does not appear in the top 10 risk factors for young men.[27] Globally it is reported that 243 million women and girls (aged 15-49) have experienced GBV in the last 12 months.[41] In a survey of 12 countries in ESA between 2013 and 2016 between 16%-30% of women reported having experienced IPV in the last 12 months.[112]

AGYW with low power and economic independence in their relationship have an increased risk of IPV and HIV risk.[113] Poor socio-economic status and older partners give men control over the timing and circumstance of sexual intercourse increasing AGYW's HIV vulnerability.[114] In 29 countries, male consent is required to access SRH services, this being a significant barrier to service access.[39]

The social norms for GBV and/or the lack of enforcement of laws to prevent GBV or to protect women from discrimination or to protect women's rights to inheritance and property, the access to education for girls, equitable access to economic opportunities and access to HIV

prevention methods that can be controlled by women are all associated with increased HIV vulnerability.[85,103]

Risk behaviour related to HIV and GBV, including IPV, are exacerbated by the breakdown of family systems through labour migration, with parental absence and reduced parental instruction and adverse gender-based norms.[115,116]

Even though violence has decreased in post-Apartheid South Africa, the country remains plagued by violent crimes and gender-based violent crimes affecting women in particular.[117]The South Africa Demographic Health Survey in 2016 reported that just over 1 in 5 (21%) of women of all ages who have had partner relationships had experienced abuse by an intimate partner at least once in their relationship; and 8 % had experienced this in the previous 12 months.[118]

Transactional Sex: Transactional sex is a term used to describe sexual relationships that entail the exchange of gifts, money or other services and is distinctly different to commercial sex work.[119] These sexual relationships are non-commercial and those engaged in them refer to themselves as boyfriends, girlfriends or lovers, instead of clients or sex workers and often share emotional intimacy.[120,121] The exchange of gifts or money experienced in these relationships is described as “implicit” because it does not always follow a sexual act and is not a negotiated rate of payment or exchange of gift in a direct “quid pro quo” manner.[114]

Even though transactional sex is practiced globally by all genders, it is endemic in AGYW in the Eastern and Southern Africa region. [120] UNAIDS reports that the prevalence in ESA ranges from 8,7% to 57% which is much higher than the prevalence of commercial sex work.[120]

In a systematic review assessing transactional sex and risk for HIV infection in sub-Saharan Africa, using pooled estimates, 10 out of 14 studies with data on women showed a positive association with HIV risk of 54% compared no statistically significant association in the two out of 10 studies with data for men and thus concluded to be inconclusive.[121]

The prevalence of transactional sex compared to commercial sex work, gender inequalities, power imbalances between AGYW and older men in particular and limited capabilities among AGYW makes transactional sex particularly important as a potential risk factor for HIV.[122–124] Gichane and colleagues found a very strong correlation and a dose-response relationship of transactional sex and socioeconomic risk factors that included low educational attainment, food insecurity, and low quality housing in AGYW in Malawi.[125]

Cash transfers and interventions that promote gender equitable relationships have shown promise in the reduction of the prevalence of transactional sex.[120,126–128] UNAIDS also recommends interventions which address social influences through interpersonal

communication approaches, to prevent transactional sex, though the evidence for this is limited.[120]

2.5.5 Health service access

Access and quality of health services in SSA are poor. Even though lifesaving prevention and treatment tools are available to address HIV; access for AGYW in Africa has lagged with 70% of AGYW in Africa not having access to comprehensive knowledge about HIV to protect themselves.[39,60] Most deaths in women in childbirth and pregnancy were in SSA (900/100 000 live births in SSA vs 9/100 000 births in HICs and 450/ 100 000 in other LMICs).[129]

Access and quality of health care and health outcomes are also determined by socio-economic factors. In South Africa, the majority (80%) of people access the public service; however, only 30% of high-income earners used public services compared to 70% of people accessing the private sector being high-income earners due to access to private medical schemes.[130] Those with the highest utilisation rates included people on medical schemes, those who have the highest income and those living in urban areas.[130]

Limited investment and attention to health systems resulting in poor access to equipment, drug shortages, limited human resources for health, poor leadership, governance and corruption in the region have been identified as some of the reasons for weak health systems in the region. [129,131] The experience of young people of the health that includes judgemental staff attitudes, poor confidentiality, inconvenient working hours and long queues and age-inappropriate health promotion information is an additional barrier to access for them.[132–134]

Just over a third of young men (36.4%) know how to protect themselves from HIV infection than young women (29.8%).[43] This has not changed much over the last 20 years as comprehensive sexuality education programmes especially in school settings have remained limited, especially in SSA.[43,135]

2.6 Chapter summary

The **rationale for this research is the need for optimised public health interventions in the youth population** that is now larger than it has ever been in history and in whom a disproportionate burden of disease is experienced when compared to children and adults.

In the context of life course epidemiology, health promotion in young people would consolidate the gains from childhood and lay a solid foundation for health and well-being in adulthood and extend into future generations.[20] **The young women age group (19-24 years) presents the final chance to establish health-promoting behaviours that would result in a stable transition into adulthood and healthier future generations**.

HIV remains a leading cause of disease and death in AGYW within the Eastern and Southern African region and South Africa in particular.[59] Even though significant progress has been made globally in addressing HIV in adults and young children, progress for AGYW is lagging. **The disproportionate HIV vulnerability of AGYW in South Africa remains intractable and is driven by high levels of health inequities, social determinants and gender inequalities**.[4,5]

Interventions that address social determinants of health such as education completion, employment, gender norms and removing barriers to healthcare access in young women have the potential to reduce HIV vulnerability and improve other health outcomes in young women.[6]

In the next chapter, the relevant literature on theoretical approaches and models for behaviour change and effective biomedical, behavioural, and structural interventions that have been implemented to address SRH/HIV vulnerability in AGYW in ESA, in particular, is reviewed.

CHAPTER 3: Literature review

This chapter describes the literature used to develop the conceptual framework for the design and evaluation of the Women of Worth programme. This chapter sets the scene to understand the potential mechanisms of change for the WoW intervention in theory and how it can be evaluated in the real world that is discussed in chapter four.

This chapter has three sub-sections. In the first sub-section, the relevant **literature to understand the theoretical concepts that govern individual behaviour change and the design of interventions** that can modify behaviours is reviewed. Understanding this literature provides a basis for the conceptual framework of how the Women of Worth empowerment intervention is expected to work in real life as described in Chapter four.

The second sub-section reviews the literature for **effective interventions for addressing HIV vulnerability in AGYW in similar settings** to those of the Women of Worth empowerment programme intervention. This was to understand the rationale for the Women of Worth empowerment programme intervention and to position it in the context of the evidence base for effective interventions to prevent and manage HIV in AGYW.

In the third and final sub-sections of this chapter, **the theory, opportunities, successes, and challenges of delivering complex interventions for HIV prevention in AGYW in the real world** are described. Even though the literature shows that complex interventions that have many components and multiple outcomes have a high likelihood of impact, they, however, also bring with them increased implementation and research complexity. This sub-section sets the scene for understanding the local-level implementation environment of the Women of Worth empowerment programme intervention and how this impacts the implementation and effectiveness of the Women of Worth empowerment programme.

3.1 Theoretical concepts of behaviour change

3.1.1 Determinants of social change

Behaviour change that is sustainable and leads to sustainable social change is complex and has multiple determinants. To provide a broad framework for understanding this complexity, Figure 5 shows a conceptual framework for social change developed by Evie Browne.[136] This demonstrates the interdependence of environmental, behavioural, and individual drivers of social change where individual behaviour change is nested.

This framework in Figure 5 has three parts. The first part demonstrates the context of multi-dimensional (social, health, economic, environmental) risks, vulnerabilities and opportunities that determine people's responses to positive or negative shocks and stresses. These

multidimensional interactions determine the risks and opportunities for people's resilience to cope with and adapt to emerging situations that affect their well-being.

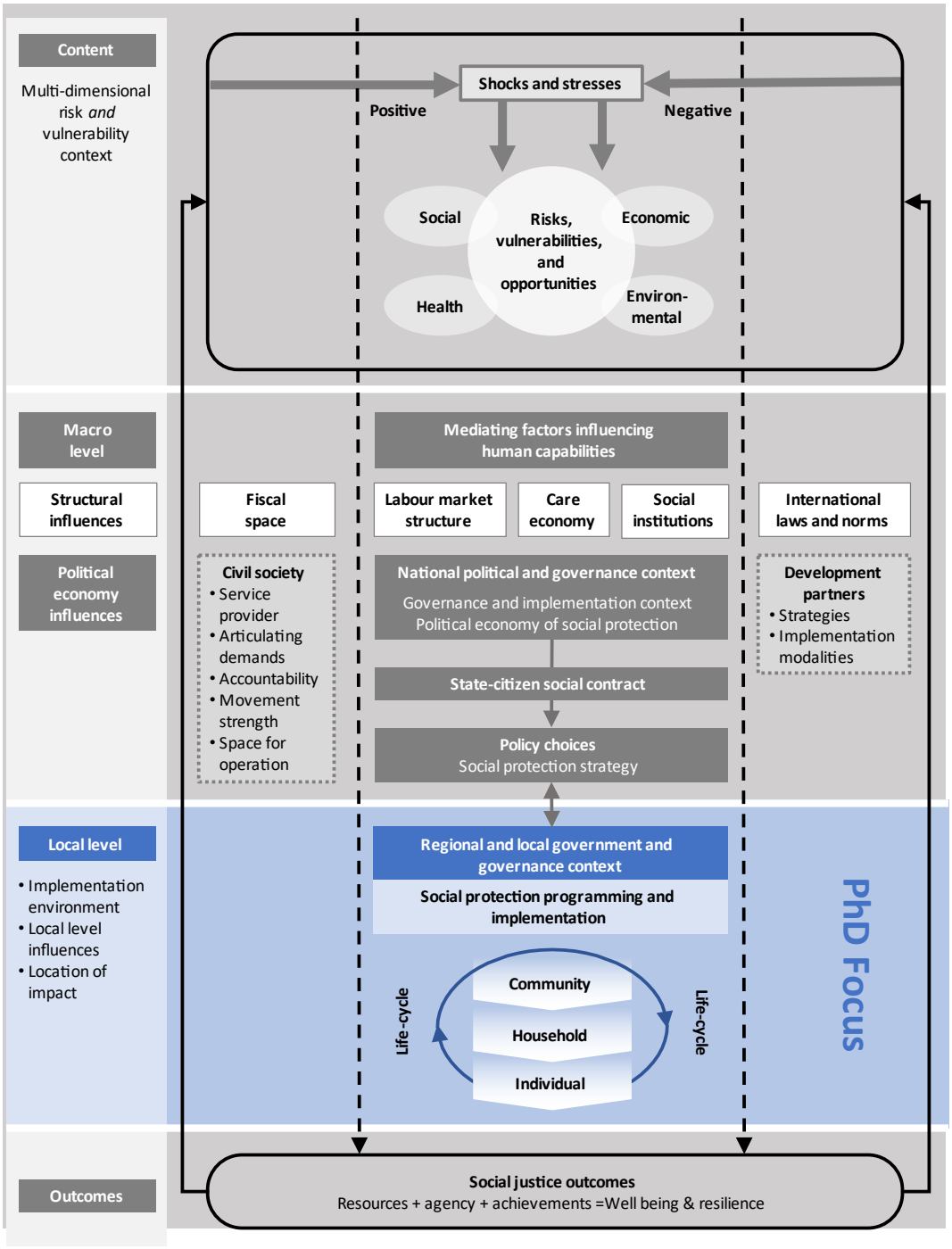
The second part demonstrates the macro-level drivers or structural influences such as the legal, political, governance, and fiscal factors as well as international and national laws and norms, access to care and social service that are mediating factors for human capabilities. These factors determine whether the environment in which people live, work, and play, would be constraining or transformative for people to live dignified and fulfilled lives. This is the ultimate objective of social change. These influences determine government/state capabilities to take responsibility for poverty reduction and social transformation and to collaborate and partner with international and civil society actors to advance sustainable and progressive social change.

The third part of Figure 5 is the interest of this research that focused on two health sub-districts covering about 1 million people in one province in South Africa. This part of Figure 5 demonstrates local-level influences of individual behaviour change. This shows the intersection of structural factors with individual households and community factors and the local-level implementation environment of the intervention.

The social, health, economic and environmental context, and the structural drivers together with local-level influences work together in complex and interdependent mechanisms to ensure population-level social justice outcomes.

Evaluating the Women of Worth empowerment programme in the context of this complexity is beyond the scope of this research. This research will be limited to evaluating the impact of the Women of Worth empowerment programme on individual behaviour change and the influence of local-level implementation factors. For the sake of thoroughness in Chapter four, the broader multi-dimensional and structural factors where the Women of Worth empowerment programme is nested are described.

Figure 5: Conceptual framework for social change[136]



3.1.2 Theoretical approach to effective behaviour change

In this sub-section, Social Cognitive Theory (SCT), Self Determination Theory (SDT) and Behavioural Economics as the relevant theoretical concepts that frame the understanding of individual behaviour change relevant to this research is described.

3.1.2.1 Social Cognitive Theory

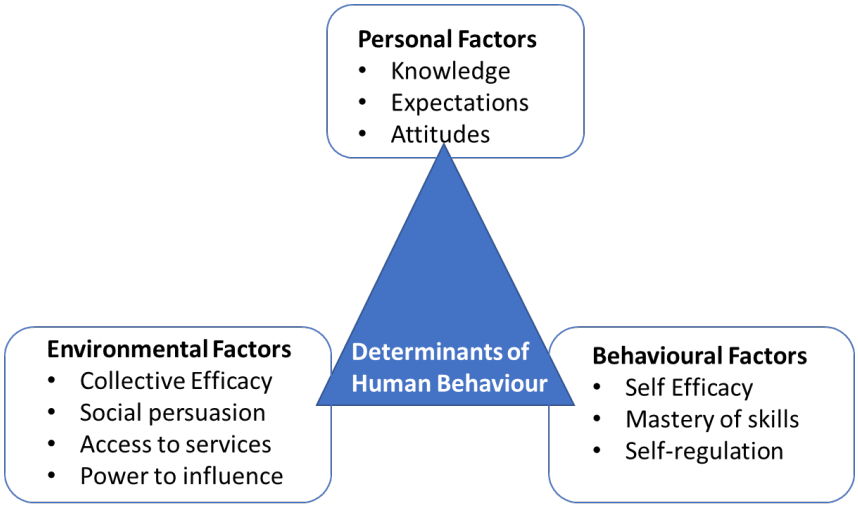
SCT is used to explain the influences of human behaviour that is determined by individual characteristics, the influence of others and the context and environment where people interact.

SCT reinforces an important influence of individual behaviour by the environment in which one grows up or lives, works or plays in.

SCT posits that behaviour change is regulated by the interdependence of personal, behavioural and structural factors.[7,137] Albert Bandura, the father of SCT highlights that choosing health-promoting behaviours and sustaining such behaviours even through adversity is not only based on an individual possessing the correct knowledge but also on factors such as self-confidence, self-regulation, perceived self-efficacy; tangible and intangible resources and social and environmental support.[7] SCT foregrounds human agency and the collective ability of people to also transform their environment to facilitate behaviour change.[138]

Figure 6 is adapted from the John Hopkins University Health Communication Capacity Collaborative illustrating SCT. It shows a more comprehensive picture of the key determinants of health behaviour which are cognitive/personal factors, behavioural factors and environmental/structural factors and can be applied to AGYW for HIV prevention as described below.[7,112,139]

Figure 6: Social Cognitive Theory [139]



1) **personal factors** of behaviour change include: the correct SRH/HIV knowledge and health literacy of how to protect oneself and maintain health and well-being; expectations that the changed behaviour will improve SRH/HIV; positive attitudes towards SRH and HIV prevention; positive self-sanction of safe SRH behaviours informed by positive social sanctions.

2) **behavioural factors** such as perceived self-efficacy (the self-belief in undertaking the required action to prevent HIV and ensure SRH) informed by experiences of mastery where the skills one possesses have been successfully practiced for SRH/HIV outcomes; modified self-belief and self-regulation to overcome somatic, emotional, and stressful states related with perceived or false perception of the inefficacy of practicing these safe practices.

3) **environmental factors (also called structural factors) include** experiences of peers and those perceived to be the same as one practising the same safe sexual behaviours – also called collective efficacy; social persuasion with verbal positive reinforcement for the importance of safe SRH behaviours by parents and role models; positive social cues, laws, policies, collective and diverse leadership to address social injustices related to SRH and HIV prevention; access to education, economic opportunities, social and health services; access to services in close proximity to one's community, power to influence policy and practice such as freedom of speech and association, democratic and fair elections.

SCT is not new but remains relevant for reducing HIV vulnerability in AGYW. The advantage of SCT is the recognition and stronger emphasis of the social and structural drivers of behaviour change and is closely aligned to concepts of social change described above compared to other behaviour changes theories such as the Health Belief Model, Theory of Reasoned Action, Theory of Planned Behaviour and the Social Learning Theory that provide a much stronger emphasis on cognitive and personal drivers for behaviour change.[138]

SCT when applied to behaviour change interventions for AGYW to reduce HIV vulnerability calls for interventions that would provide adequate information, skills, and competencies to give them the confidence that they can practice the required behaviours. Secondly, it would provide role models and showcase peers that have successfully implemented the behaviour. Thirdly, it would create a conducive policy structure and societal norms that support the desired behaviour and provide social rewards and benefits for the behaviour.

3.1.2.2 Self-Determination Theory (SDT)

Self Determination Theory (SDT) developed by Richard Ryan and Edward Deci asserts that all humans are naturally inclined to autonomy, learning, mastery (or achievement motivation) and connection with others and will thus be intrinsically motivated to act to meet these objectives.[140,141]

Autonomy in the context of HIV behaviour change in adolescence means that young people would take the initiative and ownership of their SRH-promoting behaviours because they value them and want to practice them.[142] AGYW would be inherently motivated to gain the knowledge and skills to master SRH-promoting behaviours.[143] In a meta-analysis of techniques to promote motivation for health behaviour change, Gillison and colleagues demonstrated a large effect size in interventions that supported gaining autonomy.[144]

In both intrinsic and extrinsic motivation people perform behaviours willingly and because they value them.[140] With intrinsic motivation people perform the behaviours out of enjoyment and interest whereas with extrinsic motivation people's behaviours are out of their recognised

value even though not necessarily enjoyable but performed to gain a future value or avoid a future disvalue.[141]

Autonomy is universal across cultures and is a positive predictor of more engaged learning and superior learning outcomes but it has been argued that autonomy could be weakened by external rewards or punishment used to ignite extrinsic motivation as they would “crowd out” intrinsic motivation.[145] It is argued that money as an extrinsic motivator could lead to lower quality motivation and mastery and sustainability of the health-promoting behaviour beyond the external reward.[8]

However, intrinsic, extrinsic and achievement motivation (mastery) can co-exist. For example, a person could be intrinsically motivated to do their work because they love it and find it pleasurable and also be motivated by their ability to improve their work performance and gain mastery in their trade and also be extrinsically motivated by the money they will receive because it buys them and their families opportunities for development and security.[141] Locke and Schattke argue that the integration of the three kinds of motivation is the ultimate objective.[141]

Similar to SCT, SDT also asserts that supportive conditions such as well-structured family environments with opportunities for growth and learning, positive feedback and a sense of belonging and connection; determine the translation of these natural inclinations into reality.[8]

This is supported by Martha Nussbaum and Amartya Sen’s capabilities approach which posits that well-being is a moral imperative for all humans. They assert that to achieve well-being people must have the opportunities and the freedoms to choose the life they want which is dependent on personal, socio-political and environmental factors.[146]

Ryan and Deci highlight the role of supportive teachers and parents and social relatedness in increasing intrinsic motivation and superior learning and retention outcomes. This is associated with increased engagement, perceived competence, increased self-esteem, and internalisation of learning and results in better grades and lower dropout rates.[8]

SDT is relevant for the adolescent life phase when the psychological needs for autonomy, competence and relatedness are being embedded in the transition to adulthood.[142] Supportive interventions could promote autonomy, competence and relatedness and therefore increase intrinsic motivation for health-promoting behaviours in the adolescence phase.[147]

SDT is relevant in HIV prevention programmes for young people that involve learning and practicing of health-promoting health behaviours and suggests that enhancing their autonomy, mastery and social relatedness and connection could result in sustained enjoyable

engagement in HIV prevention programmes that could ensure sustained SRH-promoting behaviours.

3.1.2.3 Behavioural Economics

Behavioural Economics in the field of contingency management provides an additional perspective on human behaviour that complements SCT. It posits that people do not always behave in rational ways that advance their long-term well-being and thus need nudges to direct their behaviour.[148]

Fully informed individuals do not always make sensible decisions after weighing the pros and cons of behaviour decisions and may value short-term gratification of risky behaviours over their long-term consequences.[148] This is known as present bias.[145]

In the context of poverty and multiple deprivations, scarcity of economic and social resources impedes rational decision-making. Poverty has been shown to impede “cognitive bandwidth”, with limited mental agility and problem-solving skills and to minimise the capacity for resilience to manage shocks.[145] Contingency Management (CM) uses principles of re-enforcement, rewards and punishments to promote health behaviours to overcome present bias and a limited “cognitive bandwidth”.[9]

CTs which are the focus of this research, are an example of a contingency management instrument that promotes behaviour change by leveraging extrinsic motivation, as discussed above, to gain a future value or avoid a future disvalue.

CTs given to poor individuals or households as a poverty reduction intervention has shown promise in reducing short-term poverty by addressing “income effects” i.e. increasing the available income for families.[149–151] Secondly, they work by addressing “substitution effects” which mitigate against financial barriers to behaviour change such as transportation costs to attend health services, and loss of daily income while attending health services.[149–151] Lastly, they work by addressing “bounded rationality effects” which increase the cost of unhealthy short-term behaviours e.g., unsafe sexual practices in AGYW that may conflict with long-term aspirations of successfully transitioning into adulthood.[149–151]

3.1.3 Behaviour change intervention design

In this sub-section the theoretical models for designing behaviour change interventions, the Behaviour Change Wheel (BCW) and the Theoretical Domain Framework (TDF) that respond to the theoretical concepts for behaviour change described above are discussed.

At the end of this sub-section in Table 2, the alignment of the theories and models discussed that determine behaviour change and the types of interventions that would be required to

respond to these determinants are mapped. In Chapter Five in Table 5, the alignment of the Women of Worth empowerment programme to these theories and models is mapped.

3.1.3.1 Behaviour Change Wheel and the Theoretical Domain Framework

The Behaviour Change Wheel (BCW) was developed by Susan Michie and colleagues after a systematic review of other existing frameworks as an evidence-based tool to guide intervention design that includes firstly understanding the nature of the behaviour to be changed and the systematic characterisation of the interventions to be implemented to impact behaviour change.[10]

The BCW is aligned with SCT in that it provides a systematic guide of the interventions that would be appropriate to address personal, behavioural and environmental drivers of behaviour. In the BCW these drivers of behaviour are further characterised as **c**apabilities (physical and psychological), **o**pportunities (physical opportunities from the environment and social factors), **m**otivation (reflective motivation requiring thought processes, planning and evaluation and automatic motivation (from associative learning, habits and emotional reactions).[152] This characterisation is also called the COM-B behaviour change model which is an acronym for **c**apabilities, **o**pportunities, **m**otivation **b**ehaviour change model.[10]

The BCW describes nine (9) intervention functions (types) that include education, persuasion, incentivisation, coercion, training, restriction, environmental restructuring, modelling, and enablement. In addition, it describes seven (7) policy categories that include communication/marketing, guidelines, fiscal policies, regulations, legislation, environmental/social planning and social provision that can be used in combination to address different drivers of behaviour.[152]

The Theoretical Domain Framework (TDF) is another framework that has been used to systematically characterise behaviour change interventions. The TDF is aligned with the BCW and provides a more granular characterisation of behavioural drivers.[11] The TDF contains 14 domains that characterise capability, opportunity and motivation described in the BCW COM-B model.[10,11]

Using the Behaviour Change Model and the TDF allows for a systematic design of comprehensive behaviour change interventions that aim to directly respond to the personal, behavioural and environmental drivers of behaviour with a high likelihood for impact.[10]

These interventions can be delivered either face-to-face (individual or group interventions) and/or at a distance to populations (via broadcast or digital or print or outdoor media) or to individuals (via phone or individually accessed computer programmes.[153]

Table 2 demonstrates and maps the alignment of the SCT, the SDT, Behavioural Economics and Contingency Management discussed above that determine behaviour change. The BCW and the TDF demonstrate the types of interventions that would be required to respond to the determinants of behaviour. This information will provide insights on the ideal components of a behaviour change intervention and guide the design of the Women of Worth programme.

Table 2: Mapping of theories, models and interventions for behaviour change [8,139,153,154]

Determinants of Behaviour					**Interventions**
Social Cognitive Theory	**Self Determination Theory**	**Behavioural Economics (Contingency management)**	**Behaviour Change Wheel**	**Theoretical Domains Framework domains**	**Intervention Functions/Types**
Personal Factors:					
			Physical capability	Physical skills	Training, enablement
	Autonomy				Enablement
	Competence		Psycho-logical capability	Knowledge	Education, training, enablement
Knowledge				Memory	
Attitude				Behavioural Regulation	
Expectation				Optimism	Education, persuasion, incentivisation, coercion
			Reflective motivation	Intentions	Education, persuasion, incentivisation, coercion
				Goals	
				Beliefs about consequences	
Behavioural factors:					
Skills				Cognitive & interpersonal Skills	Education, training, enablement
Practice			Reflective motivation	Social/Professional role and Identity	Education, persuasion, incentivisation, coercion
Self-efficacy	Mastery			Beliefs about Capabilities	
Self-regulation of stress-related emotions		Systematic bias, irrational decision-making due to present bias, scarcity, mental accounting	Automatic motivation	Emotion	Persuasion, incentivisation, coercion, environmental restructuring, enablement
Environmental factors:					

Laws, policies			Physical opportunity	Environmental context and resources	Restriction, environmental restructuring, enablement
Peer influence					Persuasion, incentivisation, coercion, environmental restructuring, enablement
Verbal positive reinforcement		reinforcement, Rewards, punishments		Reinforcement	
Collective leadership	Sense of belonging and connection		Social opportunity	Social Influences	
social norms		Social norms			
Power to influence policy and practice					
Access to resources in community		Scarcity and poverty			

3.2 Effective interventions for addressing HIV vulnerability in AGYW in similar settings.

This section describes interventions that have been shown to be effective to reduce HIV vulnerability in AGYW. This positions the Women of Worth empowerment programme intervention in context of the broader evidence-based programmatic options of a combined HIV prevention package to reduce new infections in AGYW.

The Joint United Nations Programme on HIV/AIDS (UNAIDS) is part of the United Nations representing 193 countries tasked with providing “strategic direction, advocacy, coordination and technical support to catalyse and connect leadership from governments, the private sector and communities to deliver life-saving HIV services”.[155]

UNAIDS is the global leader at the forefront of the Fast-Track agenda of ending AIDS as a global public health threat by 2030.[67] This agenda aims to bring to bear the available scientific evidence of effectiveness and implementation science, political commitments, community activism and global social solidarity to end AIDS.[156] In 2016, the UNAIDS set out very ambitious fast-track targets to end the HIV epidemic by 2030 by reducing all new HIV infections to less than 500 000 per year, and specifically to reduce AGYW new infections to less than 100 000 by 2020.[54] As discussed, these targets have not been met particularly for AGYW due to prevailing social determinants of health that drive inequality and health disparities.[43]

Figure 7 shows a menu of evidence-based programmatic options recommended by UNAIDS to reduce new infections in AGYW.[54] This guidance from UNAIDS recommends a combined

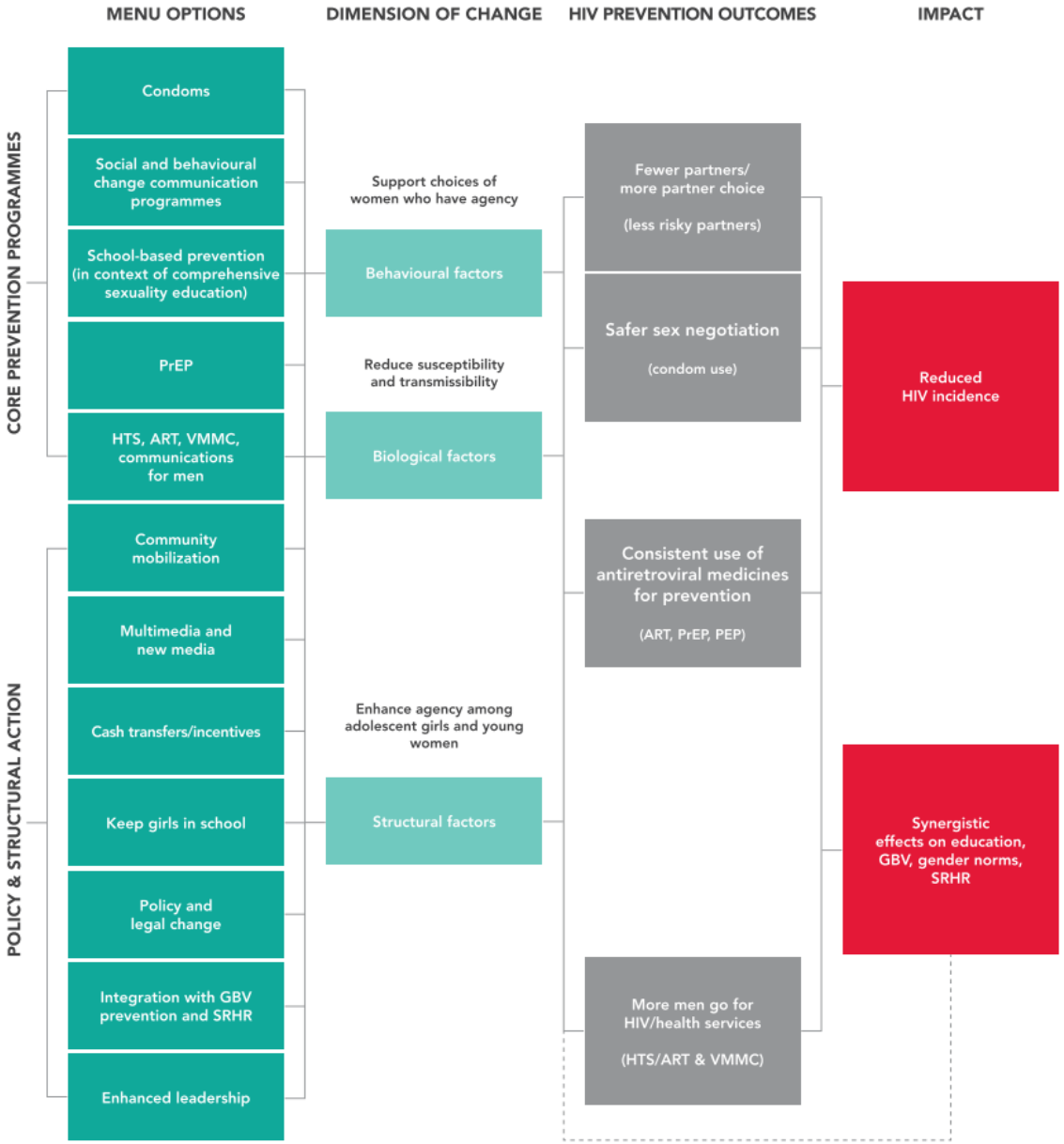
HIV prevention package to include core prevention programmes such as biomedical interventions, behavioural interventions and structural interventions that include CTs. This guidance articulates that there is, however, no “one size fits all” and countries are expected to consider their local context in determining the ideal mix of the combination prevention package with differential packages for specific priority groups. The strategy of focusing on priority populations in key locations with high density of people living with HIV is said to be highly effective.[54]

As shown in Figure 7, the menu options include core prevention programmes and policy and structural interventions.[54]

Core prevention programmes include biomedical interventions to reduce susceptibility and transmissibility of HIV and behavioural interventions that support women to realise their agency and to make health-promoting choices that would reduce HIV vulnerability.[54] These programmes aim to modify the personal and behavioural factors that drive the disproportionate burden in AGYW.

Policy and Structural interventions address the structural determinants of health including policies, laws and socio-economic factors that entrench social injustices in AGYW and other vulnerable groups such as the LGQTI+ community, sex workers, people who use drugs, prisoners and migrants; education access; CTs; community mobilisation and multi-media. [54]

Figure 7: Menu Options for HIV Prevention in adolescent girls and young women[54]



The UNAIDS menu options aim to reduce the susceptibility and transmissibility of HIV to AGYW while impacting structural factors to enhance their agency to choose SRH-promoting behaviours. HIV incidence in AGYW would be reduced by impacting risky sexual acts, promoting consistent use of antiretrovirals for prevention and promoting an increase in demand for male SRH services.

This strategy from UNAIDS aims to have synergistic effects of biological and behaviours factors; improved structural factors such as improved education, employment, gender norms; and increased access to sexual reproductive services to reduce HIV vulnerability in AGYW.

These UNAIDS menu options correlate to the theoretical concepts of behaviour change described in the previous sub-section of this chapter.

3.2.1 Core prevention programmes

These programmes aim to modify the personal and behavioural factors that drive the disproportionate burden in AGYW.

Interventions that reduce susceptibility and transmissibility of HIV infection in women include:[54]

1. Condom use
2. Treating Sexually Transmitted Infections
3. Antiretroviral programmes for HIV prevention: ART in HIV-positive persons, pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis (PEP) in persons who are HIV negative, and
4. SRH services that allow for early diagnosis and treatment.

The HIV response in the last four decades has demonstrated a heavy reliance on biomedical interventions to address HIV prevention such as female and male condoms, voluntary medical male circumcision, antiretrovirals for the prevention of mother-to-child transmission of HIV and treatment and PrEP.[157]

UNAIDS was motivated by the availability of these biomedical technologies and interventions and in particular, ART to boldly set out the audacious goal for the world to end the HIV epidemic by 2030.[158]

3.2.1.1 Addressing biological factors with biomedical interventions.

A systematic review estimating per-act HIV transmission risk reported that the risk of HIV transmission for women in an unprotected heterosexual sexual act was double that for men.[159]

This risk has been associated with a number of factors specific to the female genital tract including the relatively large mucosal surface area of the female genital tract and inflammation which may occur due to disturbances of the normal vaginal microbiome due to STIs or bacterial vaginosis.[160–163]

Condom use is a mucosal barrier intervention that has been shown to reduce HIV transmission risk 5 times; ARV treatment of the male partner reduced HIV 25 times and combined condom use and ARV treatment reduced HIV to close to zero at 0.06 infections per 10 000 exposures.[159]

Even though condoms are a highly effective barrier intervention, condom uptake and use require strong implementation supportive interventions. These include mass marketing and promotion interventions to ensure demand creation; other behavioural programmes for women

to negotiate condom use with their partners; social interventions to manage perceptions that condoms reduce sexual pleasure and implementation and logistics issues to ensure availability and supply of quality condoms.[157]

Treating Sexually Transmitted Infections: It is estimated that there is a four-fold increased risk of HIV infection in those diagnosed with an STI.[164] In low and middle-income countries (LMICs) these programmes include symptomatic treatment by syndromic management, partner notification and testing, condom use and abstinence.[165] Despite this strong correlation and the potential impact of reducing HIV by treating STIs; the evidence for the effectiveness of STI treatment programmes has been weak.[45]

The performance of programmes to treat STIs are hindered by a large asymptomatic burden of infections; the poor precision of treatment of the syndromic approach and increasing antibiotic resistance.[47,164–166] Health system challenges of limited access to health services and commodities in the Eastern and Southern African region further impede treatment access for STIs in AGYW.[19] Additionally, partner notification, testing condom use and abstinence are impacted by the gender inequalities experienced by women in the Eastern and Southern African region[50,165]

Antiretroviral programmes for HIV prevention: Antiretrovirals have significantly reduced the transmission of HIV from HIV positive pregnant women to their unborn children with the elimination of this transmission globally being within reach.[167,168] Studies have shown that HIV-positive people on ART who have an undetectable viral load for at least six months do not transmit HIV to their sero-discordant partner, resulting in a global HIV prevention campaign of "undetectable equals untransmittable."[169170]

Pre-exposure-prophylaxis (PreP): PreP for HIV is when ARVs are taken prior to exposure to HIV. Placebo trials have found PreP to be highly effective in preventing HIV.[171]

For women, the context of gender inequalities, the limited availability of HIV prevention technologies that they can control themselves and use with or without the consent of their partner, has been a key barrier to increasing access to HIV prevention.[56,157] However, community HIV prevention interventions and other behavioural, harm reduction, social, structural advocacy interventions and interventions controlled by women have received much less attention and investment contributing to the slow progress in reaching HIV control in AGYW.[157] The development of PrEP is exciting because its use is not dependent on the consent of the sexual partner and can be controlled by women in the context of unbalanced sexual power relationships.[171,172] Microbicide vaginal rings that are controlled by women have also been found to have some effect on HIV prevention but these are not commercially available.[124]

A systematic review of PrEP trials showed that PrEP works in all populations with high adherence and reduced the risk of HIV infection by more than 70%.[173,174] An HIV sero-discordant couples PreP study, found that high-risk young women had 72% protection from HIV when adherence was 80%.[175]

Post Exposure Prophylaxis (PEP): PEP is when antiretrovirals are taken for 28 days within 72 hours of HIV exposure before HIV infection.[176] Animal studies have shown more than 80% effectiveness in reducing HIV transmission.[177] The effectiveness of PEP improves the earlier the antiretrovirals are taken after HIV exposure and with increased adherence.[176]

Access to SRH services and treatment adherence are major determinants of the efficacy of treatment interventions for HIV prevention.[171] The effectiveness of these interventions can be improved by marketing and awareness campaigns, integration into YFHS and SRH services and behavioural interventions that support adherence and agency for SRH.[178]

The effectiveness of biomedical interventions is ultimately determined by their uptake and sustained use that is influenced by developmental changes in the adolescence phase. Which includes personal perception of risk, social issues such as trust, stigma, social and cultural norms and structural and legislative issues as well as the effective implementation and availability of the interventions in YFHS.[157,179]

The emotional and cognitive changes of the adolescence phase are an important consideration in the uptake of biomedical interventions and the perception of HIV risk.[180] Increasing autonomy of adolescents and separation from the primary caregivers necessitates privacy and confidentiality in the delivery of respectful and friendly health services.[180] Thus the manner in which SRH services are provided directly impact their uptake and sustained use.

Lack of trust in health providers is a challenge for discussing sensitive sexual reproductive issues.[180] The social context, hierarchies and power and the societal norms on SRH influence attitudes and values associated with young people accessing SRH services and their ability to proactively raise important SRH questions and issues with health providers that allow them to have agency in promoting their own SRH.[180]

Some cultural norms prohibit pre-marital sex and this may be a barrier to SRH service access.[180] In some countries in ESA, policy and legislation may prohibit the provision of contraceptives, condoms and SRH to unmarried women.[180]

3.2.1.2 Behavioural Interventions

Behaviour change is complex and an enabling environment for behaviour change that addresses social barriers to accessing biomedical interventions; barriers to accessing

information, motivation and barriers to support for individuals, households and communities to make health-promoting choices is essential.[181]

Behavioural interventions address personal and behavioural factors described in the previous sub-section to support women to realise their agency and to make health-promoting choices that would reduce HIV vulnerability.[54] These include the gaining of correct SRH/HIV knowledge, health literacy, positive attitudes towards SRH with reasonable expectations that the changed behaviour will improve SRH/HIV outcomes. Behavioural factors such as perceived self-efficacy, the experiences of mastery and self-regulation also help to enhance AGYW's agency for safe sex practices.

Behavioural interventions include sexuality education programmes and social and behaviour change interventions.[182]

Comprehensive sexuality education (CSE) is a curriculum-based programme offered in schools to enhance knowledge, skills, attitudes, behaviours and SRH and justice from an early age.[135,183] Comprehensive sexuality education can also be offered at YFHS, and youth centres and is delivered by teachers, health providers or peers.[135,183] This is a major intervention with high reach potential in schools in particular.

UNAIDS reported, however, that most Eastern and Southern African countries had policies for comprehensive sexuality education in primary and secondary schools.[59] The challenges to ensuring this translates to improved knowledge to prevent HIV infection is the limited investment in the programme, poor capacity of educators to provide non-judgmental sexuality education and unfavourable gender-based norms.[133,135]

In ESA comprehensive sexuality education has low coverage and poor quality.[135] There is often tension between religious and cultural values and the human rights approaches to comprehensive sexuality education. Most comprehensive sexuality education programmes in ESA foreground abstinence with limited capacity development in gender inequality, power imbalances, termination of pregnancy, sexuality and sexual orientation.[183] School governing bodies with very strong religious views influence the delivery and uptake of comprehensive sexuality education in schools.[183]

Interventions offered in schools are not adequately adapted for different contexts and needs, teachers are poorly capacitated and supported to deliver the curriculum and there is little co-creation with young people and diverse community structures.[183] The power differential and judgmental attitudes of teachers who are poorly capacitated to deliver a context-appropriate curriculum create barriers to empowering conversations with young people about health-promoting SRH behaviours.[183] Furthermore, parents sometimes resist the implementation of

comprehensive sexuality education fearing that it would promote early sexual debut and unhealthy SRH behaviours.[183]

Out-of-school youth as is the interest of this research, can be reached by peer-led, extracurricular comprehensive sexuality education programmes in Youth Centres in community based settings that include safe spaces for gathering, health promotion, SRH services, even though this has limited coverage.[135,183]

In keeping with SCT, interventions to support behaviour change are classified as **Social and Behaviour Change Communication (SBCC) interventions** and include:[181,184]

1. Interventions that promote demand by:

1. Increasing awareness, knowledge and understanding
2. Promoting mastery and agency
3. Supporting motivation, positive attitudes, perceptions and beliefs

2. Interventions that address environmental factors (structural factors)

1. Social norms and role models
2. Enabling systems and policies

3. Interventions that address supply (structural factors)

1. Availability of health services
2. Quality of health services

Demand-promoting interventions are the main interest of this research as their target audience are individuals, families, partners, and peers. Of particular interest in these demand-promoting interventions that facilitate empowerment are mastery and agency for SRH-promoting behaviours also called behavioural interventions.[181]

The context and dynamics in communities frame perceptions, norms and behaviours related to HIV, sexual health seeking and gender norms influencing HIV vulnerability in AGYW.[157,185] The demand for biomedical interventions or safe sexual behaviours requires the correct knowledge and motivation to access services, adhere to interventions and practice safe sexual behaviours. This is affected by individual attitudes, beliefs, and social norms.[184] Engagement with adolescents is important to understand how to position interventions to ensure acceptability, uptake and maximal exposure.[3,6,39]

The WHO recommends an empathetic engagement approach when developing youth and services that are empowering.[25] This style of engagement is particularly important in the context of the transitional developmental phase where the behaviours of young women are

amenable to interventions. Empathic engagement styles in safe and trusting environments enable active self-reflections on motives, goals, expectations and beliefs regarding SRH behaviours.[186] This allows for personal growth and self-responsibility that promotes the gaining of agency and autonomy for SRH.[140]

Empowerment interventions support the gaining of power, control and resources that promote well-being. These programmes have included face-to-face weekly small group or one-to-one peer or facilitator-led empowerment programmes over several weeks to improve knowledge, behaviour and disease outcomes of HIV and other STIs such as the Herpes simplex virus (HSV-2).[187,188] The programmes have been shown to reduce HIV risk factors, GBV and to improve agency and autonomy.[182]

Effectiveness of behavioural interventions: Even though there are useful frameworks that guide the implementation, roll out and coverage of SBCC interventions such as those described in the previous sub-section; the BCW COM-B system and the TDF; there is a paucity of behavioural interventions for AGYW that are rigorously designed and evaluated to grow the knowledge on effectiveness and the optimal intervention design for maximum effect.[10,11,189]

Out of 61 behavioural interventions identified for HIV prevention by the Centres for Disease Control and Prevention (CDC) only eight (8) were based on the “best evidence” suggesting a research and design gap in AGYW HIV prevention behavioural approaches.[189]

In a recent systematic review of HIV prevention interventions in AGYW, about 40% addressed individual personal and behavioural factors such as HIV information and awareness, skills-building, condom use negotiation and application, HIV risk self-assessment and self-management, partner choices and maintaining healthy relationships.[190] These interventions were delivered using varied methods either face-to-face or online, using Edu-drama, individually or in groups, delivered by peers or facilitators or counsellors or teachers and delivered either as a single session lasting 90 minutes or multiple sessions delivered weekly over a wide-ranging number of weeks.[190]

Overall, there is poor evidence of the effectiveness of behavioural interventions in reducing new HIV infections. Only 1 in 5 interventions reviewed showed changes in behaviours such as increased condom use and reduction of multiple sexual partners[190,191] Comprehensive sexuality education before sexual debut has, however, been shown to increase sexual autonomy and confidence of AGYW to negotiate safe sexual practices.[67] This highlights the importance of comprehensive education starting in the early primary school stages.

A study in Malawi showed that behaviour change interventions were more effective when augmented with a CCT.[192] Stepping Stones, an 11-session livelihood intervention for men and

women in rural South Africa to reduce GBV, HIV and improve SRH, attended twice a week for 12 weeks showed improved impact when augmented with an economic empowerment intervention and for both men and women improved earnings, GBV and gender attitudes.[187,193,194]

This evidence suggests that biomedical interventions are not shown to be effective as sole interventions; behavioural interventions also need to be in combination with other interventions to be effective.

The demand and supply (both availability and quality) of behavioural interventions and the context in which these interventions are delivered such as cultural and social norms and role modelling either promote or impede sustained behaviour change.[184]

Due to the complex influences on behaviour change, the most successful behavioural interventions engage other household and community actors in addition to the individuals of interest and help address environmental and supply factors also known as structural factors.[181]

Interventions to address these structural factors include advocacy efforts and non-communication strategies such as health systems strengthening interventions that ensure the supply of biomedical interventions and legislative interventions.[181] These interventions target governments, service providers, non-governmental organisations, and community leaders. The sub-section below describes the interventions related to policy and structure.

3.2.2 Structural Interventions

The role of these social determinants of health in driving HIV vulnerability in AGYW in the Eastern and Southern African region is explored in depth in Chapter two.

Structural interventions target social, economic and political drivers (social determinants) of HIV such as poverty, inequality, access to production resources, education, employment, gender norms, access to social safety nets, quality health and social services, and laws to protect human rights.[155]

Addressing structural drivers for HIV vulnerability in adolescence increases the population impact more than interventions directed to individual behaviour change.[195] Globally, the disproportionate burden of HIV, TB, other infections, malnutrition, trauma and violence, mental health disorders and other NCDs in young people is driven by structural determinants.[3,6] Thus addressing these in young women could have a multiplier effect of not only impacting HIV but is likely to impact other diseases due to the cross-cutting nature of these determinants.[6,195]

Structural interventions include social protection interventions and social determinants of health factors that impact the primary causes of HIV and many other diseases which advance human development more broadly.[78,196] Structural interventions include[155,196,197]:

1. A legal framework that foregrounds equity, justice, and human rights,
2. Access to education, employment, health,
3. Access to sustainable food systems and healthy environments,
4. Access to safe spaces for AGYW,
5. Access to social protection interventions,
6. Mass community interventions to address gender norms, improved parenting, empowerment, and behaviour change communication interventions.

Laws, policies, and cultural practices influence the distribution of power and resources and access to services to promote the autonomy of young people to make health-promoting choices in the phase of transitioning into adulthood. Even though progress has been made in addressing some of these issues that drive gender inequality, such as increasing access to education and economic opportunities and woman representativity in society; no country has reached gender equality and progress towards reducing the disproportionate HIV vulnerability of AGYW remains unacceptably slow.[4,5]

As discussed in chapter 2 (research problem), AGYW in ESA live in the context of poverty, high unemployment, low educational attainment, gender inequalities and patriarchal social norms. This context limits AGYW's access to resources and opportunities which put them at increased HIV risk. There are still laws in ESA that require men to give permission for women to receive sexual reproductive health services.[39]

Some ESA countries recognise general, customary and religious laws some of which might be discriminatory against women in terms of rights to land and other assets especially when these legal systems conflict and women find themselves caught in between them.[198] These discriminatory laws can further deepen the gender inequalities and increase HIV vulanrabilities.[120]

Funding for HIV in Eastern and Southern Africa: Multi-sectoral planning and implementing programmes for young people is impeded by poor prioritisation in policy development and limited financial investment in HIV prevention.[199]

Funding for HIV programmes in the region has increased over time with 42% of these resources provided by governments.[112] In the region, the President's Emergency Plan for AIDS Relief (PEPFAR) contributed 39% and the GF 11% of approximately US$ 10.6 billion in HIV funding in 2017 which was a 130% increase over the previous decade.[112]

However, the low investment in prevention compared to treatment and limited focus on social and structural drivers of the HIV epidemic has affected the accessibility of these technologies to reduce HIV vulnerability.[157,158]

The Eastern and Southern African countries which applied a module for adolescents and youth in the 2017-2019 allocation period, dedicated an average of 4.6% of Global Fund funding for HIV component to prevention among adolescents and youth. This proportion was rather small given the over-representation of this segment of the population in the new infection rates. A stronger emphasis on this prevention is needed to end the epidemics of HIV/AIDS.[200]

Sexual reproductive health services: The effectiveness of biomedical interventions is predicated on the availability, acceptability and accessibility of contextually appropriate, comprehensive quality SRH and rights services that have the following elements:

1. accessibility and gender responsiveness
2. confidentiality
3. free from coercion, stigma and discrimination
4. human-rights based approach.
5. contextually and culturally appropriate
6. integrated and linked to other relevant services[35,180,201]

Providing SRH services to AGYW using these aforementioned elements would allow for the prevention of HIV and other STIs, early diagnosis and effective disease management that prevents complications in the short and long term.[35]

Youth-Friendly Health Services (YFHS) are services that are provided to address barriers to service uptake by young people such as age-appropriate health promotion information. Confidential services, staff attitudes that allow open and empowering conversations for informed choice, opening times and locations that are convenient for youth people to access.[35,202,203]

In High-Income Countries (HICs), the majority of young people (70-90%) are reported to access health services at least once a year compared to lower coverage in LMICs.[180] In South Africa, only half the young people aged 15-24 years have access to ARVs.[66] There is limited and weak evidence on the effectiveness of YFHS access and outcomes.[180,201]

A systematic review showed that the evidence for YFHS was largely from poor-quality studies with significant bias.[201] Out of 37 studies reviewed globally; two showed reduced teenage pregnancies, three increased contraception uptake, and three showed increased knowledge and patient satisfaction.[201] An evaluation of YFHS in South Africa found that YFHS did not improve the experience of young people nor were they recommended to friends and peers any more than standard health services.[204]

Critical factors to youth's increased acceptability and acceptance of YFHS are shown to be friendly, kind and respectful staff with positive and empowering attitudes, privacy and

adequate and age-appropriate information.[204–206] Mobile Health services that bring health services closer to young people have been shown to increase access and SRH outcomes.[132,134,205]

Social protection interventions are an important example of structural interventions that ensure a social safety net for the vulnerable. These interventions are divided into three types of programmes.[207]

1) ***social assistance programmes*** which include **unconditional and conditional CTs**, social pensions, food and in-kind transfers, school feeding schemes, public works programmes, fee waivers and other social services. These programmes usually target poor households to **reduce poverty and inequality** and beneficiaries do not make a financial contribution to them.

2) ***social insurance*** which includes contributory old age, survivor, disability pensions; sick leave, maternity/paternity leave; health insurance coverage and other types of insurance and aims to ensure adequate living standards in the face of shocks and life changes and

3) ***labour market programmes*** which are contributory and non-contributory and include active labour market programmes (training, employment intermediation services, wage subsidies) and passive labour market programmes (unemployment insurance, early retirement incentives to improve chances of employment with good earnings and smooth income during periods of unemployment.

3.2.2.1 Cash Transfers

The World Bank reports that 142 countries invest in social assistance with more than 80% of them providing school feeding schemes, 70% unconditional cash transfers (UCTs) and 43% providing CCTs.[207] Even though over two billion people have been reached with social assistance, there is inequity in their distribution with HICs having the highest coverage and less than half of those in LMICs having access to social assistance.[207] Only 17.4% of people in Africa have at least one social protection benefit, this is the lowest rate of all regions compared to a global average of 46.9%.[208]

South Africa has one of the biggest social protection programmes in Africa. In 2020/21 there were seven different grant types with 18,4 million beneficiaries making up 30.6% of the population, much higher than the average in Africa (17,4%) but lower than the global average 46.9%.[208,209]

Furthermore, 18.9% of youth 15-24 years benefitted from social grants given to households.[109] Parents or caregivers of South African children under the age of 18 years qualify for a Child Support Grant (CGS) that is an UCT of R400 per month. Recipients enter the programme via

a means test: an annual income of R48,000 ($3200) or less (R4,000 [$265] per month) if a single parent, or R96,000 ($6400) per annum (R8,000 [$530] per month) if married. However, this CT is not available for children over 18 years old regardless of financial need.[210]

Comprehensive social protection programmes that include CTs are recommended as they have transformative potential as integrated poverty reduction programmes.[211] These programmes can be a long-term "social vaccine" instead of short-term "financial vaccines" a description sometimes applied to CTs.[212] The "social vaccine" suggested could be transformative by empowering poor people to move out of poverty by building their human capabilities and assisting them to overcome oppressive social and structural systems including supply-side interventions that ensure access to readily available, person-centred and high-quality social services.[12,213–215]

For example, in South Africa, the state provides social grants to the poor including children, the elderly, and other vulnerable people; free health services and free education up to tertiary education for children from poor families, school feeding programmes, unemployment insurance, parental support, sporting programmes, social services and functional governance and accountability mechanisms.[216] The challenge, however, is ensuring equitable coverage of high-quality integrated service delivery and ethical leadership.[217,218]

In the suite of social protection programmes, CTs have become popular evidence-based policy instruments. Policy-makers favour CTs as they aim to address structural risk factors related to the distribution of money, power and resources which may influence individual risk behaviours.[197,219]

In Africa, UCTs doubled from 21 countries in 2010 to 40 countries in 2014 and CCTs grew exponentially from two (2) countries in 1997 to 27 countries in 2008 to 64 countries in 2014.[150,215,220,221]

CCTs started three decades ago in Latin America in the mid-1990s as a way of simultaneously addressing poverty and intentionally promoting human capital development by providing conditions to receive cash.[213]

CCTs drive demand for social services by using contingency management principles that reward health-promoting behaviours; however, the incentive must be of an adequate magnitude with minimal temporal delays between the behaviour and incentive to be most effective.[150] Payments are made to individuals/households contingent on a particular human development behaviour e.g. school attendance, access to a health service for example; maternal child health service or a behaviour change HIV testing, participating in capacity development programmes or workshops.[151,207,219,222–224]

CTs conditional on school or service attendance has shown convincing evidence of increasing access to education and health services; they have; however, shown mixed results on improving the quality of education or achievement of long-lasting health outcomes including for HIV.[214,215,221,225] Two of the biggest CCTs in Latin America are the “Oportunidades” in Mexico and “Bolsa Familia” in Brazil, which have resulted in significant improvements in household inequality, education, nutrition and child health.[215]

Evidence from Africa has also shown increasing uptake of preventive health services, particularly for immunisation, as well as preventive child and woman’s health services and more recent evidence has shown promising impacts on SRH behaviours.[151,226]

Implementation challenges: CCTs are politically palatable because they provide a level of assurance that the cash will result in an impact.[220] Policymakers assume however, that social services are available for the public and that the public, particularly the poor, need the incentive to access them and would not otherwise choose to access them for their own good.[213]

This paternalist attitude has been criticised where the state is thought to make decisions for people instead of implementing a rights-based approach that fundamentally dismantles systems and structures that drive poverty and barriers to service access.[214] In fact CCT’s do not impact the supply side of interventions and even if the demand is created when services are unavailable or are of poor quality, CCT’s may be erroneously perceived to be ineffective.[215]

CCTs are also usually given to women to ensure that they benefit the family and child health and even though this might be thought to be progressive; a critique of this strategy has been the potential psychological burden this places on women to fulfil these conditionalities.[214] Conditionalities may increase the administrative cost of implementation and may also systematically leave the most marginalised out of the programme who cannot meet the conditionalities and thus excluding those who are most in need.[214] Involving communities in reaching those in greatest need for CT programmes has been shown to improve access of CT’s.[227] CT programmes that appropriately target the most vulnerable can be powerful instruments of citizen engagement and social accountability. [228]

Delivery mechanisms of CT’s such as systems to disburse the funds and the timing thereof are an important considerations and are context specific. Ideally these delivery mechanisms should be simple and user friendly to reduce barriers to access. In some settings regular cash in hand at short intervals might be convenient but issues of safety and security, long distances and long queue may be barriers to access.[229] Mobile technologies are becoming popular delivery mechanisms that can circumvent some of the challenges of cash-in hand mechanisms and may be easier to monitor and target the most at need populations. However digital

solutions may also have their own challenges. Women in particular due to gender disparities may have limited access to mobile phones, limited education and digital literacy. [229]

The effectiveness of CT programmes is also dependent on them being implemented at scale which requires political will, financial commitments and budgeting with good coordination, systems development and continuous monitoring and evaluation. [229]

In summary, **CTs are popular social assistance programmes that are prevalent in South and Eastern Africa** and are a component of structural interventions that have **shown promise as an intervention that drives demand for health and social services with promising evidence for improving SRH outcomes**.[214,215,221,225] Evidence shows that structural interventions that eliminate gender inequalities, increase agency, access and funding for HIV prevention services including technologies that women can control; would reduce HIV vulnerability in AGYW and address the social determinants of health that drive HIV vulnerability.[56,157]

In South Africa, the UCT given to poor households nationally called the Child Support Grant (CSG) ends at 18 years. This is at a time of increased HIV vulnerability associated with developmental transitions into adulthood in the context of financial risk due to high unemployment and low high school completion has shown to increase transactional and inter-generational sex which creates unequal sexual power relationships.[230,231] This further highlights the relevance of this research.

Chapter five is a scoping review to determine the effectiveness of CT interventions to reduce HIV vulnerability in young women in ESA. This scoping review aimed to contribute to the development of the research conceptual framework of how the Women of Worth empowerment programme would be expected to work in the real world and informed the research to determine the pathways of effect of the Women of Worth empowerment programme.

3.3 Implementation: The application of theoretical concepts in the real world

The complexity of the drivers for HIV in young women and the evidence of the effectiveness of biomedical and behavioural interventions call for multi-determinant approaches that include biomedical, behavioural and structural interventions that have a greater impact than single biomedical intervention approaches.[18,216,232–236]

This approach in AGYW includes programmes that improve the availability of biomedical interventions and implements socio-behavioural change communication interventions such as condom demand creation programmes, group empowerment and skills-building interventions,

school-based prevention programmes, comprehensive sexuality education in schools and structural interventions that include CTs.[54]

The layered approach is when a complex public health intervention is designed that has multiple programmatic components aiming to influence multiple behavioural changes with multiple population outcomes.[237]

Complex interventions for HIV prevention in AGYW that take into account behavioural theories and that are implemented in community-based settings have a better likelihood of impact but also increase implementation complexity.[238] This is due to the potential dynamic, interlinked, interdependent relationships and interactions of the intervention and contextual factors.[238]

The reality is that community-based interventions are subject to contextual elements that may impact implementation and evaluation.[239–241] There has been the false presumption that when implementing these interventions, there are linear and predictable implementation processes that can be controlled through standardisation.[242] In fact, there is a need for dynamic interventions that can be adapted to meet the needs of the local site while retaining fidelity to the theoretical concepts underpinning the intervention.[238]

Combination implementation for HIV prevention defined "as the pragmatic, localized application of evidence-based strategies to realize high sustained uptake and quality of HIV prevention interventions" has been identified as a means of translating clinical trial evidence into practice by using adaptive methods.[243,244] Adaptive trial designs have been identified as a means to ensure trial efficacy in AGYW HIV prevention research.[189]

These methods, however, come with methodological challenges that can introduce bias and result in inadequate power to evaluate effectiveness.[245] Guidance for the design and evaluation of complex interventions recommends four phases namely development, feasibility/piloting, evaluation and lastly implementation of the research findings into policy and practice.[169,246]

Due to these challenges, there is a dearth of evidence of complex layered combination HIV prevention interventions in AGYW.[189] In a recent review of HIV prevention intervention in adolescents, Hosek and Pettifor concluded that even though evidence of effective biomedical behavioural and structural interventions exist, combination HIV prevention approaches that have been rigorously evaluated are still required.[189] Implementation science methods that aim to understand and overcome barriers to implementation in complex and rapidly changing contexts are important in HIV prevention trials.[247,248] This, therefore, requires the use of multiple research methods that can be adaptive and may need multiple phases to accommodate the contextual elements.

A review of CTs and other layered HIV interventions for AGYW in Africa has found that their effectiveness is affected by intervention design, community acceptance and other macro-economic and political contextual issues.[249,250] Even with the importance of context on intervention uptake, studies seldom share reasons for study modifications, how they were done and their impact on the intervention.

A review of evaluations or research of economic empowerment HIV prevention interventions for AGYW in SSA found that there was a major gap in knowledge on the implementation and maintenance of these programmes.[251] In this review, none of the studies reported on programme fidelity and protocol modifications nor on information to inform the applicability of the studies to local context relevant for translation to policy and practice in the real world.[251]

A review of methodological approaches used to evaluate CTs found that reviews failed to report on adaptations in their findings.[252] This incomplete reporting is a challenge in large public health programmes that may be affected by contextual issues, e.g., The DREAMS (Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe) 5-year evaluation has found that countries do not often share their implementation lessons, impeding efficient and effective implementation at scale.[253] Accordingly, in this research efforts have been made to document and share implementation considerations and lessons to address this gap.

3.3.1 Evidence for implementation from large complex interventions in AGYW in the region

Combination implementation for complex HIV prevention intervention recognises the intersection of personal, socio-political, and environmental factors in ensuring behaviour change to reduce HIV vulnerability in AGYW.

Studies in multiple settings have demonstrated the advantages of integrating HIV and sexual and reproductive health care. For example, the Microfinance for AIDS and Gender Equity (IMAGE) project which combined microfinance with an HIV training programme reduced IPV in women in Limpopo in South Africa.[254]

The Girl Power findings from Malawi showed the combination intervention of YFHS, behavioural interventions and CCTs resulted in participants accessing HIV testing 2.4 times more; using condoms 7.9 times more and accessing hormonal contraception 6 times more when compared to standard of care.[132] This study also found that behavioural interventions together with YFHS did not improve clinical outcomes more than YFHS alone. The authors of this relatively small localised study called for implementation science research to determine how such interventions could be brought to scale and policy discussions on the feasibility, appropriateness and cost-effectiveness of CT interventions.[132]

The incorporation of community engagement processes in large HIV prevention trials have been recommended to support context-appropriate research designs and implementations strategies where qualitative research methods can be used as "listening tools".[185,255]

The SHAZ! project in AGYW in Zimbabwe was an example of a conditional CT combined intervention with multiple components that used community engagements and adaptive methods to mitigate contextual socio-political factors to maximise programme feasibility and uptake.[256]

This can be implemented 1) during formative research; 2) during implementation to use adaptive methods to ensure maximal exposure of the intervention and to understand unintended consequences 3) during the dissemination of results to understand the value and usefulness that communities assigned to research findings and to understand what further research the community felt was important.[185,255]

The importance of community engagement in research for adolescents who, by design, see the world differently to adults who are the ones mainly designing research projects, cannot be overstated as a key component of a package of interventions to ensure maximal coverage of relevant and acceptable interventions to address health and well-being in adolescents more generally.[3]

A study in South Africa has shown that community engagement and mobilisation that aimed to build collective action to address the intersections of HIV risk and unequal community gender-based norms was shown to reduce HIV incidence in AGYW, highlighting community engagement as an intervention in its own right to reduce HIV vulnerability in AGYW.[257]

These layered complex programmes are being taken to scale through donor funding: PEPFAR and the GF have invested significantly in programmes addressing HIV in AGYW in ESA specifically.[253,258] The DREAMS programme mentioned above is a complex intervention funded by PEPFAR in 10 high-burden countries in ESA (South Africa, Lesotho, Swaziland, Mozambique, Zimbabwe, Zambia, Uganda, Malawi, Kenya, Tanzania) aiming to reduce HIV incidence by 40% in two years.[259,260] The GF also supports AGYW HIV programmes in 13 high burden countries in ESA that include the 10 PEPFAR countries plus Cameroon, Namibia and Botswana.[261] Both these funders support layered AGYW interventions in multiple settings that address biomedical, behavioural social and structural determinants and strengthen health systems.[258,260] The South African government has also launched an intersectoral collaboration initiative to address multiple drivers of HIV vulnerability in AGYW.[262]

Early evaluations of the DREAMS and the GF for the AGYW programme found the programmes to be essential but ambitious in scale and timeline, slow to start with low funding absorption due to limited implementation capacity and capabilities.[241,253,263,264,309] The

programmes were more accessible to younger people who were in school, HIV-negative and sexually active.[253,265,266] Structural barriers of transportation and competing family responsibilities for young people impacted negatively on the access to these programmes.[265] For the sustainability of these programmes, integration with national funding, planning, monitoring and evaluation is required.[241,253]

3.4 Chapter Summary

Behaviour change that is sustainable and leads to sustainable social change is complex and has multiple determinants. **Theoretical concepts of developing an evidence-based behaviour change** intervention that could be applied to addressing the research problem and reducing HIV vulnerability in young women 19-24 years ESA were explored.

According to social cognitive theory (SCT), behaviour change is regulated by the interdependence of **personal, behavioural and structural factors**.[7] Self-Determination Theory (SDT) asserts that all humans are naturally inclined to **autonomy, learning, mastery and connection with others** and will thus be intrinsically motivated to act to meet these objectives.[8] Behavioural economics posits that **people do not always behave in rational ways** that advance their long-term health and thus need nudges to direct their behaviour.[9] The Behaviour Change Wheel (BCW) and Theoretical Domain Framework (TDF) **provide a guide on how to design interventions that would address these determinants** of behaviour.[10,11]

Due to the complexity of the determinants of HIV, complex multi-layered programmes that include **structural, biological and behavioural interventions are needed** to effectively address the key drivers of HIV vulnerability was explored. The **evidence** for the effectiveness and lessons from the implementation of complex interventions that reduce HIV vulnerability in young women in Eastern and Southern Africa is limited.

In the next chapter, this evidence of effective behaviour change design and what is known about effective SRH/HIV prevention interventions in young women in ESA was used to develop a conceptual framework of **how the Women of Worth empowerment programme was expected to have an effect in theory**. In Chapter seven, this evidence and the findings of the research to evaluate the Women of Worth empowerment programme were used to develop a conceptual framework for the pathways of effect for the Women of Worth empowerment programme **when it was implemented in the real world**.

CHAPTER 4: The conceptual framework for the design and evaluation of the Women of Worth programme

The Women of Worth empowerment programme was **a Cash-plus community-based combination SRH/HIV prevention programme** combining a CT of ZAR300 (USD22) on completion of each of 12 SRH/ HIV empowerment skills-building sessions (BI) in 10 community sites and where **YFHS were promoted and made accessible** in two sub-districts in Cape Town, Western Cape, South Africa.

The research conceptual framework presents assumptions and theoretical descriptions of mechanisms of action and causal pathways of how the Women of Worth cash-plus empowerment programme would work in a real-world setting to reduce HIV vulnerability with the primary outcome being changes in HIV prevalence. This informs the design of the intervention, the evaluation methods and the expected outcomes.

This chapter describes **the implementation context and the design of the Women of Worth intervention** shown in Table 3 is based on the theoretical concepts of behaviour change and behaviour change intervention design described in Chapter three and the evidence of the implementation of effective interventions that reduce HIV vulnerability in AGYW. The design consists of individual components of the Women of Worth empowerment programme that aim to address the behaviour change determinants as informed by the evidence discussed in Chapter three. The

This chapter also demonstrates **the conceptual framework for the evaluation of the Women of Worth empowerment programme and** presents assumptions and a conceptual description of mechanisms of action and theoretical causal pathways of how the Women of Worth cash-plus empowerment programme would work in a real-world setting to reduce HIV vulnerability.

Finally, the **theory of change for the Women of Worth empowerment programme describes the programmatic logic** for the inputs, output, intermediate and final outcomes that are evaluated The research methods evaluated the Women of Worth empowerment programme based on the programmatic logic.

4.1 The implementation context of the Women of Worth empowerment programme

4.1.1 The broader structural context of the Women of Worth empowerment programme

This section of the chapter describes the broader structural factors that include policy, prioritisation, planning, funding and social norms that drive HIV vulnerability in AGYW where the Women of Worth empowerment programme is nested. Even though these broader

structural factors were not evaluated in this research, this discussion provides an important context and understanding of the Women of Worth empowerment programme.

The South African Aids Council (SANAC) is a multisectoral agency co-chaired by the Deputy President of South Africa and a Civil Society representative that is responsible for guiding a collective response to HIV, TB and STIs in South Africa. This agency aims to addresses the multi-dimensional structural influences of HIV vulnerability. The role of SANAC is to;[267]:

1. foster dialogue between government, civil society and other stakeholders and promote partnerships,
2. strengthen the multi-sectoral response in programme coordination and management, technical and sectoral support and capacity building,
3. provide policy and strategy advice,
4. strengthen governance, leadership and management of the response,
5. resource mobilisation (domestic and international),
6. monitoring and evaluation of the collective response.

In line with this, SANAC is responsible for developing, monitoring and reviewing the 5-year National Strategic Plan (NSP) for HIV, TB and STIs and developing country-level funding proposals to and coordinating funding from local and international donors such as PEPFAR and the GF.[268]

In the period 2016-2019, the GF, through SANAC grant funding integrated, multi-sectoral, multi-setting interventions for young people aged 10-24 years in 10 priority districts to respond to the disproportionate burden of HIV in AGYW in South Africa. This was part of a broader national AGYW SRH/HIV prevention, care, and support programme of age-appropriate interventions.

The GF programme package offered a combination HIV prevention intervention that included a conditional CT for young women 19-24 years to address social determinants to test the feasibility and gain lessons to inform future programming in two provinces: Kwa-Zulu Natal and the Western Cape[269].

The Zimele programme that will be discussed below, was funded through SANAC and contracted to the Desmond Tutu Health Foundation (DTHF) at UCT, as part of this GF-funded programme to fight AIDS, Malaria and Tuberculosis programme in the Western Cape. The Zimele programme included the Women of Worth empowerment programme. The Women of Worth empowerment programme was locally nested in a larger national and provincial government HIV prevention programme context. The Women of Worth empowerment

programme was specifically developed by the DTHF to test the feasibility of a cash-plus care intervention in young women 19-24 years in Klipfontein/Mitchell's Plain subdistrict.

This broader structural context of the Women of Worth empowerment programme is important because even though this research is only evaluating the Women of Worth empowerment programme and its impact on individual behaviours of young women 19-24 years in two sub-districts in Cape Town; the Women of Worth empowerment programme forms part of a much bigger more comprehensive national programme to address HIV and TB in South Africa.

This context is also an important opportunity for the findings from this research to be efficiently translated into national policy and practice. In a recent review of factors that facilitate research translation into policy and practice in LMICs, three strategies were identified as important:

1. the evidence being sought by stakeholders.
2. stakeholder involvement in the design and implementation of the research
3. using participatory and transdisciplinary approaches to co-produce the evidence to inform policy.[270]

Research findings for the evaluation of the Women of Worth empowerment programme are anticipated by both provincial and national policymakers as the programme was co-created and funded by the key stakeholders responsible for evidence-based policy translation.

4.1.2 The regional and local context: Zimele Programmes

The Western Cape Department of Health and Wellness (WCG: H&W) was one of the primary recipients of the funding from SANAC sourced from the GF to implement the AGYW programme alongside other programmes funded by the national government and other funders in the NSP to address HIV and TB. The WCG: H&W contracted the DTHF, a registered non-profit research organisation within the Faculty of Health Sciences at the University of Cape Town, as its implementing partner for the AGYW programme.[271]

The WCG: H&W oversaw coordination, programme management, monitoring and evaluation of the full HIV and TB response in the Western Cape Province and informed by SANAC and National Department of Health policies and strategies co-designed the interventions and implementing strategies for the Zimele (AGYW) programme with the DTHF.

The Zimele programme was executed in two health sub-districts of the City of Cape Town called Klipfontein and Mitchell's Plain in the Western Cape Province, one of the 10 priority districts to implement the national AGYW programme funded by GF. The Zimele project is named after an isiXhosa word meaning, "be independent".[271]

Zimele used an ecological approach to implement interventions at the level of the individual, family, schools, community and structural change focusing on health systems strengthening

and policy influence.[269] In particular, it provided a comprehensive, layered, multi-sectoral programme consisting of SRH/HIV age-appropriate interventions for early, mid and late adolescents (young women) and early interventions for adolescent boys (10-14 years).[238] The Women of Worth empowerment programme was part of this catering to the 19-24-year-old young women who were no longer school learners.

The Zimele community engagement programmes were part of the full Zimele programme and included community engagements and men's dialogues on gender-based norms, GBV, SRH, and HIV. This included engagements with health system actors to support health systems strengthening initiatives within government health facilities to provide Youth-Friendly Health Services (YFHS).

4.1.3 Intervention implementation context: Girl Power Pre-cursor

The Women of Worth empowerment programme was informed by and adapted from a prior research study called Girl Power which undertook to understand the value of CT plus care interventions in enhancing SRH service uptake in Malawi and South Africa. In Chapter three, the importance of adaptative implementation and research methods when undertaking research in community settings with complex contextual factors was discussed. Basing the Women of Worth empowerment programme on an earlier project gave the team some important insights into some of the challenges in conducting projects of this nature. The Girl Power study enrolled and followed 250 AGYW aged 15–24 years for one (1) year in each of the four comparable health facilities in Malawi and South Africa (N=2000 total) with each health facility allocated to one of the four models of care.[272]

1. **Model 1 Standard of care:** fragmented family planning, HIV testing and counselling (HTC), and STI syndromic management provided in general primary health care services without any additional interventions to improve access for AGYW.
2. **Model 2 Youth-Friendly Health Services (YFHS):** providing integrated adolescent-friendly family planning, HTC and STI services with additional health system modifications to ensure youth-friendliness,
3. **Model 3 YFHS + behavioural intervention (BI)**: Model 2 plus 12 monthly facilitator-led, interactive sessions on health, finance and relationships,
4. **Model 4 YFHS+BI+ CT conditional on 12 monthly BI session attendance**.

The South African site for Girl Power was in Klipfontein/Mitchell's Plain sub-district in Cape Town and was implemented by the DTHF. In contrast, the Women of Worth empowerment programme trial size was tenfold larger than the Cape Town Girl Power study; and implemented only Model 3 and Model 4 with the following key modifications made:

1. **randomisation strategy**: Girl Power used a cluster-randomisation strategy but the health system challenges at each of the facilities were a significant confounder that made it difficult to interpret the findings of service uptake of the AGYW in all four (4) models. This led to the Women of Worth empowerment programme modifying the randomisation strategy to individual randomisation and providing technical support to 24 health facilities in the two sub-districts to improve their youth friendliness. The Women of Worth empowerment programme allowed young women to access health services in any one of these facilities and provided youth-friendly mobile health services.
2. **recruitment & setting of intervention**: Girl Power recruitment was done from health facilities and behavioural interventions were implemented at or close to the health facilities. This, however, impacted the attendance of BI interventions as all the AGYW did not live close to the health facilities. The Women of Worth empowerment programme was thus shifted from facility-based to community-based recruitment and delivery of the Women of Worth empowerment programme intervention.

4.2 Designing the Women of Worth empowerment programme.

The conceptual framework for the theoretical mechanisms of action of the Women of Worth empowerment programme is shown in Figure 8 and was guided by the theoretical approaches summarised in Table 2 labelled “Mapping of theories, models and interventions for behaviour change”.[8,139,153,154] In summary:

1. According to **Social Cognitive Theory,** behaviour change is regulated by the interdependence of personal, behavioural and environmental factors.[7] Behaviour change requires not only addressing **personal and behavioural determinants** such as having the correct knowledge, skills competencies and the psychological attributes of self-confidence, self-regulation, and perceived self-efficacy but also requires the addressing of **structural determinants** that include social and environmental resources that support this behaviour change.[7]
2. **Self-Determination Theory** asserts that all humans are naturally inclined to autonomy, learning, mastery and connection with others and will thus be intrinsically motivated to act to meet these objectives.[8]
3. **Behavioural economics** posits that people do not always behave in rational ways that advance their long-term well-being and thus need nudges to direct their behaviour.[9]
4. **The BCW and TDF** further unpack determinants of behaviour and provide a guide to effective intervention design.[10,11]

The Women of Worth empowerment programme drew from all these elements as illustrated in Table 3, which shows the WoW programme components mapped against the theories and models for behaviour change.

Table 3: Mapping of the Women of Worth empowerment programme intervention and theories, models and interventions for behaviour change

Determinants of Behaviour						
Social Cognitive Theory	**Self Determination Theory**	**Contingency management**	**Behaviour Change Wheel**	**Theoretical Domains Framework domains**	**Intervention Functions**	**Women of Worth programme components**
Personal Factors:						
			Physical capability	Physical skills	Training, enablement	**The Content of the 12 Women of Worth empowerment sessions**
	Autonomy				Enablement	
Knowledge	Competence		Psycho-logical capability	Knowledge	Education, training, enablement	
				Memory		
Attitude				Behavioural Regulation		
Expectation				Optimism	Education, persuasion, incentivisation,	
			Reflective motivation	Intentions	Education, persuasion, incentivisation,	
				Goals		
				Beliefs about consequences		
Behavioural factors:						
Skills				Cognitive & interpersonal Skills	Education, training, enablement	**The Facilitation methodology of the Women of Worth empowerment programme**
Practice			Reflective motivation	Social/Professional role and Identity	Education, persuasion, incentivisation,	
Self-efficacy	Mastery			Beliefs about Capabilities		
Self-regulation of stress-related emotions		Systematic bias, irrational decision-making due to present bias, scarcity, mental accounting	Automatic motivation	Emotion	Persuasion, incentivisation, environmental restructuring, enablement	**The Cash transfer conditional on the attendance of empowerment sessions**
Environmental factors:						
Laws, policies			Physical opportunity	Environmental context and resources	Environmental context and resources	**Structural, regional and local government context**
Peer influence		Social norms			Persuasion, incentivisation, environmental restructuring, enablement	**Peer cohorts** from same community **Facilitators** from local community who were positive
Verbal positive reinforcement		Reinforcement, Rewards, punishments		Reinforcement		

						role models
Collective leadership	Sense of belonging and connection		Social opportunity	Social Influences		**Engagements** by the broader Zimele programme with the **community and men to address positive gender norms**
Social norms		Social norms				
Access to resources in community					Restriction, environmental restructuring, enablement	Engagements and interventions by the broader Zimele programme with the **health system and health system actors to address health service access Cash transfer to increase income** as a resource

4.2.1 Addressing personal and behavioural determinants of HIV vulnerability.

In reference to Table 4 and the Women of Worth empowerment programme components, **the content of the 12 Women of Worth empowerment sessions**: aimed to **increase skills, competence, and capabilities** by providing correct knowledge and facts about HIV and SRH, sexuality and sexual empowerment and safe sex behaviours. This can be classified as **education, training, and enablement** intervention functions based on the BCW and TDF.

Due to the complexity of HIV prevention in the youth developmental phase and the impact of structural factors; the women of worth empowerment sessions included knowledge and facts about healthy relationships, emotional well-being, goal setting and goals, career planning, job seeking, GBV, active citizenry, and activism. A summary of the content of the twelve sessions is shown in Table 4.

Table 4: Summary of 12 Women of Worth programme sessions

Session Name	Session Purpose	Session Name	Session Purpose
TREE CEREMONY	Inception, introduction and safe space rules of engagement	**THE GODDESS**	Sexual empowerment & sexuality
JOB HUNT	Setting & achieving career goals	**CONTRACEPTIVE CHEMISTRY**	Contraceptives, medication & access to health care
QUEEN BUILDING	Healthy lifestyles, emotional well-being and beauty perceptions	**POWER TO THE PEOPLE**	Citizenship and activism
THE APPRENTICE	Finding a job & representing yourself well	**IT TAKES A VILLAGE TO RAISE A CHILD**	Pregnancy and Childbirth
CHOOSE YOUR POISON	Improving self-perception of risk & decision-making	**PASSION FLOWER**	Healthy Relationships
THROWING THE PUNCHES	Exploring strength, vulnerability and GBV	**GRADUATION CEREMONY**	Celebrating accomplishments

The Women of Worth empowerment programme manual with further details of the programme is included as an attachment to this manuscript in Appendix C. The passport included in Appendix D was a personal aid to the manual, which allowed for individual interaction with the programme along the lines of a personal diary. The passport aided participants to practice the new behaviours they learnt, receive feedback from family and friends and read further or access other resource materials to strengthen their knowledge and competence.

The facilitation methodology of the Woman of Worth empowerment programme promoted mastery of skills and was supported by the empathetic facilitation approaches used in the Women of Worth empowerment programme that included **education, persuasion, and incentivisation** functions based on the BCW and TDF.

All participants co-created rules of engagement for the group that would ensure psychological safety. The Women of Worth empowerment programme sessions included **role-playing and practicing of strategies** and outside the programme sessions **self-reflection and feedback** from friends and family. When appropriate, group reflection was used to provide feedback to a participant after role-playing or practicing a learnt behaviour.

The promotion of **self-confidence, self-belief, self-sanction, and self-esteem** to perform positive SRH behaviours was also enabled by the facilitation model of the Women of Worth empowerment programme sessions. This included individual and group reflections during sessions and between sessions guided by the Women of Worth empowerment programme facilitators and by self-facilitation via the passport. The sessions were delivered in **an enabling, non-judgemental, supportive learning environment** to promote autonomy and intrinsic motivation.

To support **observational learning**, these sessions were delivered at community sites by near-peer facilitators also known as “igniters” who were young adults (women) from the same community as the participants who could be perceived as role models. The facilitators were trained on the manual content and to use **active listening and empathetic engagement approaches** and utilise the **collective lived experiences of participants** during facilitated sessions.[186,273]

Facilitators were trained to be mindful of **non-verbal cues and ensure that the space for the empowerment skills-building sessions** was conducive for **safe and empowering conversations** with participants. The facilitators were also trained to pay attention and suspend their judgement of what the participant was sharing and question, probe, and support participants to be reflective. They could also draw in the experiences of the other participants and their own experiences into the conversations to allow participants to **understand their feelings and gain new perspectives and insights**. Whilst trained to deliver key messages for each session as per a detailed manual, the igniters were also allowed to **adapt the sessions depending on the needs of the participants** related to the topic under discussion.

The CT was given conditionally on the attendance of 12 evidence-based facilitator-led Women of Worth empowerment sessions with inter-session activities aimed to provide financial incentives and **reduce barriers for sustained participation and ensure an output of recruitment and retention** in the programme. The CT aimed to address systematic bias and irrational decision-making due to present bias, scarcity, and mental accounting. The CT performs the function of persuasion, incentivisation, environmental restructuring, and enablement.

4.2.2 Addressing structural determinants of behaviour.

The Women of Worth empowerment programme was nested in the **broader structural, regional, and local government context** responding to structural determinants of behaviour. This is discussed in the first two sub-sections of the chapter.

Peer cohorts of Women of Worth participants were enrolled from the same communities and attended sessions run by near-peer facilitators who were positive role models. These sessions were given in groups of peers with respectful engagements by **local facilitators** aimed to increase **social support and relatedness** enhancing **self-esteem, agency, and autonomy**.

Engagements by the broader Zimele programme with the community and men to address positive gender norms and engagements and interventions by the broader Zimele programme with the health system and health system actors aimed to facilitate collective leadership, transform social norms, and leverage resources to reduce HIV vulnerability in AGYW.[269]

The **Woman of Worth CT** is in line with behavioural economics theory aimed to **reduce financial barriers** to programme participation by functioning at the behavioural and structural levels. Behaviourally the CT aimed to **"nudge" participants to participate** in the programme and to promote sustained engagement in the programme. At the structural level, the CT is a financial resource for livelihoods. The CT provided conditional on the attendance of a Women of Worth session would exemplify persuasion, incentivisation, and enablement functions.

4.3 The conceptual framework for the Women of Worth empowerment programme evaluation

The conceptual framework for the Women of Worth empowerment programme evaluation is shown in Figures 8 and 9. Figure 8 depicts the potential theoretical causal pathways of effect of the Women of Worth empowerment programme as follows:

1. **Macro-level structural, regional and local influences:** the programme would be nested in a macro and regional level context that would address structural, regional and local influences of behaviour change. Local contextual factors will likely require **adaptive research methods and inputs into the programme implementation** to support the **outputs of efficient recruitment, retention and programme delivery.**
2. **Community and men's dialogues** implemented within the broader Zimele programme would be an input into the programme and **promote positive gender norms and mobilise health services resources** to promote safe sexual behaviours and uptake of health services as an intermediate outcome.
3. **The CT** given conditional on the attendance of 12 evidence-based facilitator-led Women of Worth empowerment programme sessions with inter-session activities would provide financial incentives and reduce barriers for sustained participation and ensure an **output of recruitment and retention in the programme.**

4. **The Women of Worth empowerment programme sessions** would increase **intermediate outcomes of knowledge, skills, competencies and capabilities** for health literacy (SRH/HIV/GBV/Mental Well-being), healthy relationships, career planning and job seeking, and active citizenry.

5. **Respectful and empathetic engagement** would also promote **intermediate outcomes of mastery, self-reflection and self-responsibility**. The **community of peers** would provide **social support and a sense of sisterhood** that would facilitate sustained engagement in the programme and programme impact. The Women of Worth empowerment sessions implemented using empathetic engagement approaches and supported by a community of peers would promote **agency and autonomy for SRH** and part of a package of intermediate outcomes.

6. **Increased opportunity**: The promotion of health services during sessions and the availability of fixed and mobile youth-friendly services as programme inputs would increase the opportunity for **uptake of SRH services as an intermediate outcome.** The Zimele intervention would strengthen youth-friendly services and provide mobile health services to participants to address the availability of biomedical interventions that promote HIV prevention. The availability of computers and the internet would **increase opportunities for job seeking and career planning** which is also a programme input.

7. Agency and autonomy for safe SRH behaviours and **increased opportunity for uptake of sexual and reproductive health services and job seeking** would increase **motivation for safe** SRH **behaviours, as an intermediate outcome**

8. **Increased motivation** to practice health promoting SRH behaviours would **reduce HIV as a primary outcome and increase** SRH **behaviours and employment as secondary outcomes.**

The theory of change is a planning and evaluation method that provides a **working model for testing the research conceptual framework** of how an intervention is likely to work in the real world.[274] The theory of change follows a programmatic logic to depict the relationship between the inputs into the programme, the expected outputs, and intermediate and final outcomes based on the theoretical causal pathways.[274] The Theory of change in Figure 9 shows:

INPUTS:

1. Macrolevel level interventions, Community dialogues, Adaptive research methods,
2. CT, 12 Empowerment Sessions, Respectful and empathetic engagement,

3. Youth-Friendly Health Services

OUTPUTS:

1. Sustained Engagement: Recruitment & Retention,
2. Efficient programme delivery

INTERMEDIATE OUTCOMES:

1. Knowledge, skills, competencies and capabilities (health literacy healthy relationships, career planning and job seeking, and active citizenry)
2. Mastery, self-reflection and self-responsibility,
3. Motivation, agency and autonomy for SRH,
4. Sense of community

FINAL OUTCOMES

1. Primary Outcome: Reduced HIV
2. Secondary Outcomes: Increased safe SRH behaviours & increased employment.

Figure 8: The conceptual framework for the Women of Worth empowerment programme evaluation

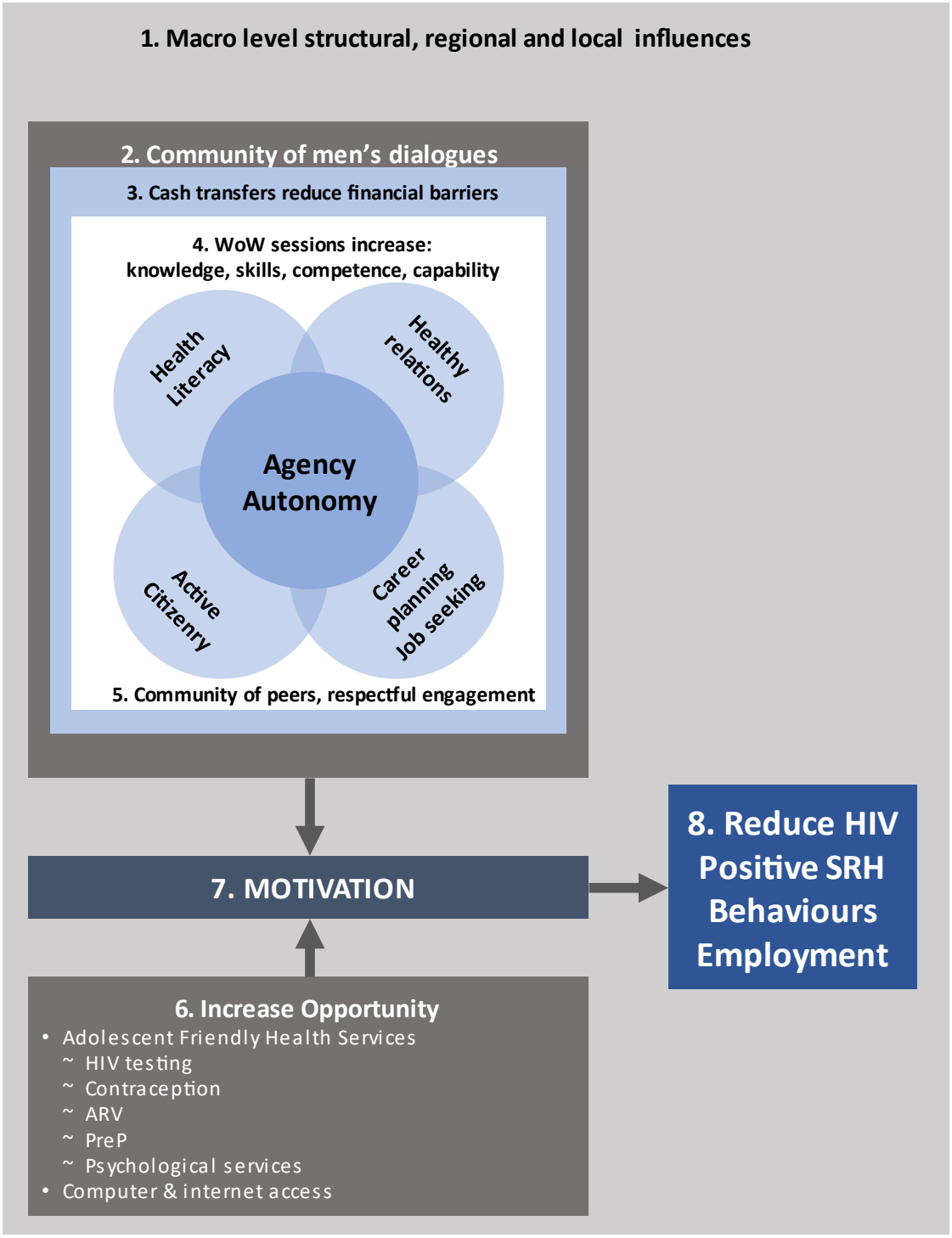
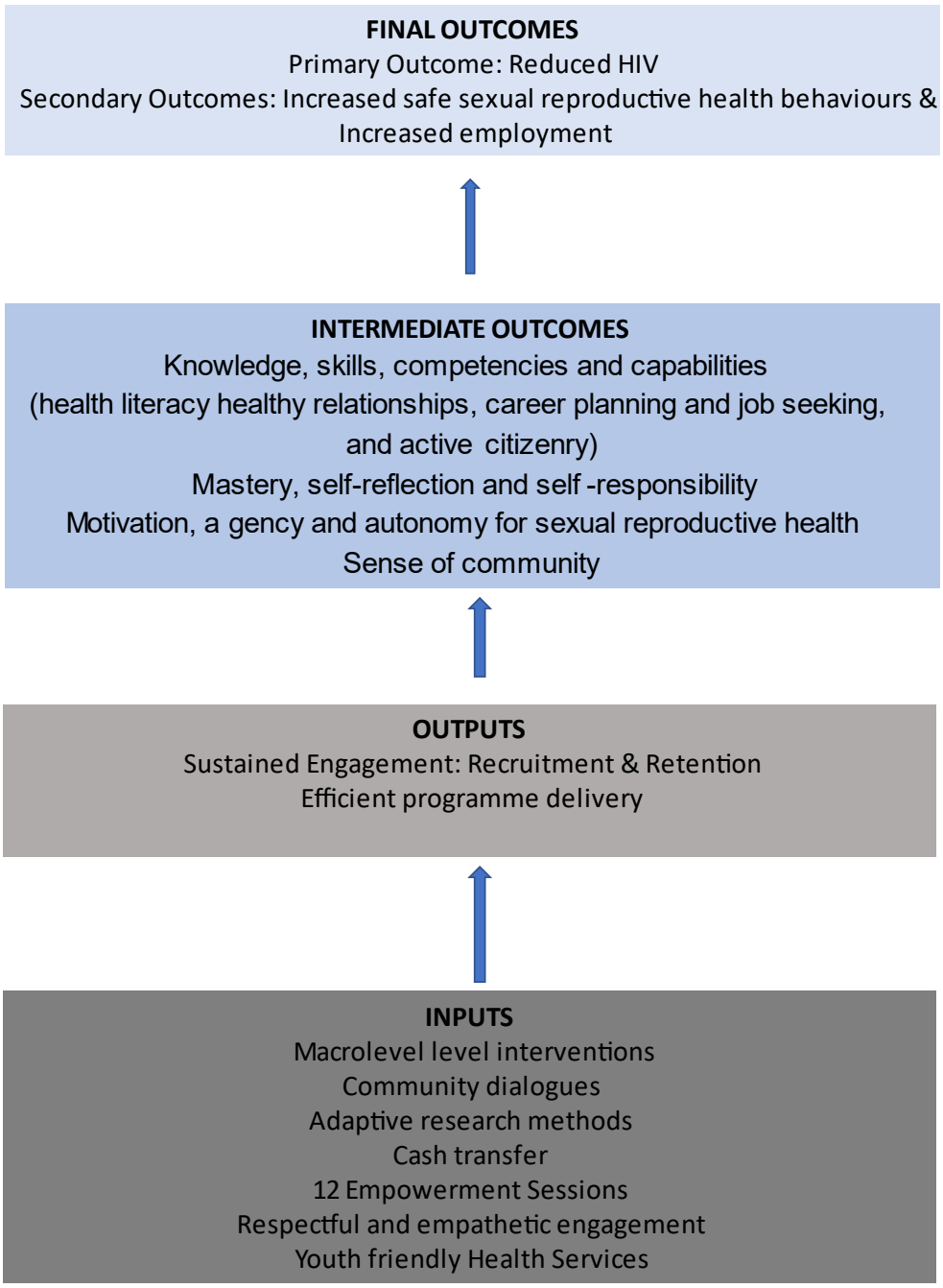


Figure 9: The theory of change showing inputs, outputs and outcomes expected for the Women of Worth empowerment programme*



4.4 Chapter summary

The theoretical concepts of behaviour change, and behaviour change design discussed in Chapter three, have supported the development of a conceptual framework for the Women of Worth empowerment programme design and evaluation. The design of the Women of Worth empowerment programme **shows how the different components could theoretically promote the desired behaviours** and informed the conceptual framework for the evaluation

that used a theory of change model to test the theoretical mechanisms of action and the intermediate and final outcomes of the Women of Worth programme.

The assumptions made were that the inputs into the programme that include the macro-level interventions, **adaptive research methods, community dialogues CTs, respectful and empathetic engagement and access to YFHS** would result in **sustained engagement** in empowerment sessions and ensure efficient programme delivery.

Sustained engagement in the programme would result in intermediate outcomes that include **increased competence, mastery, motivation, agency and autonomy** for healthy SRH behaviours and safe spaces of sisterhood.

The intermediate outcomes would result in the primary outcome of **reducing HIV and secondary outcomes of safe reproductive health behaviours and increased employment.**

The evaluation of the Women of Worth programmes will assess this theory of change and assumptions and Chapter six will detail the research methods for this evaluation. The research methods evaluated the Women of Worth empowerment programme based on the programme logic.

CTs are of particular interest in this research and the evidence for their effectiveness as described in Chapter three, to reduce HIV vulnerability in AGYW in ESA is still emerging.

In the next chapter, a scoping review to determine the effectiveness of CT interventions to reduce HIV vulnerability in young women in ESA is described.

CHAPTER 5: Scoping review - Determining the effectiveness and pathway of effect for cash transfers that reduce HIV vulnerability in AGYW in Eastern and Southern Africa.

5.1 Background: Cash transfers

CTs have been used to increase the uptake of health services such as immunisation, preventive child and woman's health services, diabetes, hypertension and HIV treatment and to promote healthy behaviours such as safe sexual behaviours; smoking, alcohol and drug cessation, and reducing obesity.[149]

UCTs provide cash to poor households without any conditionalities attached to receiving the cash such as national social grants and aim to address structural determinants of poverty.[149]

CTs as described in Chapter three and further articulated in Table 5; work through an "income effect", a "substitution effect" and a "bounded rationality effect".[149–151] CTs are thought to "nudge" an individual to start new behaviours and thereafter, a learning and reinforcement effect occurs that could be permanent.[149] In instances where the effects have a temporal delay for example, in HIV infection, then individuals could require repeated CTs as reminders, this however, is likely unaffordable at scale.[149]

Cash-plus interventions are interventions which aim to support the building of human capabilities by augmenting the "income effects" of cash with additional human development components such as behaviour change and addressing supply-side interventions to improve quality of services.[12]

Cash-plus interventions are divided into two types: a) Cash-plus components that provide cash with additional benefits such as, information regarding behaviour change, skills-building interventions or psychosocial support; b) Cash-plus linkages to external services such as access to health or other services from other sectors.[12] Table 5 below summarises the distinctive characteristics of CTs.

Table 5: Summary Characteristics of Cash transfers

	Unconditional Cash Transfer (UCT)	Conditional Cash Transfer (CCT)	Cash-plus
Cash given to individual or Household	Yes	Yes	Yes
Cash given on condition of uptake of a behaviour or a service	No	Yes	Yes (UCT) No (CCT)
Income effects (Increases income)	Yes	Yes	Yes
Substitution effects (Augments for lost income of accessing a health service)	Yes	Yes	Yes
Bounded rationality effects (increase the cost of unhealthy short-term behaviours)	No	Yes	Yes (CCT) No (UCT)
Other development interventions included as either part of the programme or as a referral	No	No	Yes

There is evidence that cash-plus programmes are effective in driving service demand when designed to suit the local context and are supported by other complementary services that deal with service availability and quality, especially where baselines are already very low.[275,276]

5.2 Current evidence of the effectiveness of CTs in HIV prevention in AGYW

A large review of CTs done globally by Bastagli and colleagues that evaluated the effects of CTs from 2000–2015 in multiple countries, population groups and ages where 38% of the studies were from SSA found that CTs were effective in keeping girls in school and increasing their access to health services.[277]

Increased exposure to education has been shown to result in hope and aspiration for the future as a pathway to reducing HIV vulnerability in AGYW.[149,215,278–284] Both conditional and UCTs

have been shown to improve household financial sustainability with associated improved family relationships and gender attitudes.[128,285–287] The financial independence from the CT given to young women have also improved their relationship with intimate partners, with improved negotiation power and reduced reliance on men.[128,285,287]

The effects of CTs in HIV prevention more directly was evaluated by Stoner and colleagues in a large systematic review from 2000–2020 where most of the studies were from the Eastern and Southern African region and assessed adolescent populations even though not primarily focused on these population groups.[288] This review assessed the effects of CTs, interventions to reduce school fees and savings programmes. This review found that only eight of the 27 studies assessed included an HIV biomarker and only 3 of the studies had an effect on HIV incidence or prevalence; 56% reduced sexual debut but most of the studies did not show a strong association with other SRH behaviours.[288]

Stoner and colleagues concluded that even though there is strong evidence for CTs in human development; the evidence for their effectiveness in preventing HIV is limited. The authors, however, concluded that the evidence of delaying sexual activity while the young women were exposed to the CTs was promising.[288]

A review of the effects of CTs on HIV incidence in AGYW in SSA done by Baird and colleagues; also found promising evidence of effect but found a lack of large high-quality studies with high power and long term follow-up.[289]

More research on CTs has been recommended especially in key populations and cash-plus interventions that are provided in combination with other human development interventions to address individual and contextual factors to promote behaviour change and service uptake.[149,288,289]

The effectiveness of CT interventions is affected by contextual and individual factors such as levels of inequity, access to social services, cultural and religious beliefs, gender norms and human rights are thought to give rise to heterogeneous findings in evaluation studies.[149] Similarly, the size of the CT, the timing and frequency thereof and the duration of exposure and implementation factors also impact the effectiveness of CT interventions.[277] The heterogeneity of outcomes and the complexity of the mechanisms for the effects of CTs necessitate a better understanding of the pathways of effect for different groups in different contexts.

5.3 Objectives of the review

A scoping review that was broader than evaluating the effectiveness of CTs as in a systematic review was undertaken.[290] This review had the primary objective of determining the

effectiveness of CT interventions to reduce HIV vulnerability in young women in ESA. A secondary objective of the review was to determine the pathways of effect of CTs in reducing HIV vulnerability. These findings will be applied in this research to develop a conceptual framework for cash-plus interventions for young women in the Eastern and Southern African region.

5.4 Methods

A multi-step process to identify, review, and analyse existing CT interventions which aim to reduce HIV vulnerability in AGYW in ESA was followed. For this review, CTs were defined as conditional and unconditional CTs, microfinance and lotteries that use “price and income effects” to effect behaviour change and excluded interventions that provided educational support and vocational training as the only interventions.[149,251]

5.4.1 Search Strategy

I was assisted by a librarian, Dr Patricia Makwambeni, to undertake a systematic iterative search of the literature over the period of 2010-2021 summarised in Table 6. A preliminary search was undertaken on PubMed, searching the medical subject headings for the terms “Behaviour and Behaviour Mechanisms” AND “HIV” AND “young adults” OR “Adolescent” AND “CT programmes” in all fields and got 51 results, labelled PubMed (1st search) in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram in Fig 5-1. For comprehensiveness, a second search was conducted across 4 different databases (EBSCO, PubMed, Web of Science, Scopus) using a broader search strategy involving the following terms “CT programmes” AND “HIV” OR “Acquired Human Immunodeficiency Syndrome” OR “Human immunodeficiency” AND “Sub-Saharan Africa” OR Africa “South East Africa” OR “Angola” “Botswana” OR “Burundi” OR “Comoros” OR “Eswatini” OR “Kenya” OR “Lesotho” OR “Madagascar” OR “Malawi” OR “Mauritius” OR “Mozambique” OR “Reunion” OR “Tanzania” OR ”South Africa” OR “Uganda” OR “Zambia” and “Zimbabwe”. Filter terms used were “English”, “Adolescent:13-18 years”, “Adult: 19+ years”, “Young adult:19-24 years”,” Female”, Dates “2010-2021”.

Table 6: Literature Search Strategy

Systematic iterative search	2010 – 2021
Preliminary search	PubMed
Medical subject terms	1. "Behaviour and Behaviour Mechanisms" 2. HIV 3. Young Adults or Adolescents 4. Cash transfer
Secondary search	EBSCO, PubMed, Web of Science, Scopus
Broader strategy terms	1. "Cash transfer programmes" 2. HIV or Acquired Human Immunodeficiency Syndrome" OR "Human immunodeficiency"
Region of Africa	"Sub-Saharan Africa" OR Africa "Southeast Africa"
Countries	1. "Angola" 2. "Botswana" 3. "Burundi" 4. "Comoros" 5. "Eswatini" 6. "Kenya" 7. "Lesotho" 8. "Madagascar" 9. "Malawi" 10. "Mauritius" 11. "Mozambique" 12. "Reunion" 13. "Tanzania" 14. "South Africa" 15. "Uganda" 16. "Zambia"

	17. "Zimbabwe"
Filter terms	18. English, 19. Adolescent: 13-18 years 20. Adult: 19+ years 21. Young adults 19-24 years 22. Female

5.4.2 Inclusion and exclusion criteria

The inclusion and exclusion criteria are shown in Table 7. These criteria aimed to identify literature on CT interventions that reduced SRH/HIV vulnerability and new infections in AGYW in ESA and their pathways of effect. CT interventions were the primary outcomes of study while, outcomes for HIV-positive AGYW, GBV, and mental health were outside of the scope of this review.

Table 7: Inclusion and exclusion criteria

Inclusion Criteria	
Primary Intervention:	Cash transfer, conditional or unconditional and lotteries microgrants disbursed to participants or households.
Study population:	Adolescent girls and young women in ESA, HIV negative or HIV positive or HIV unknown
Primary Outcomes:	HIV incidence or prevalence, STI, Condom, pregnancy, STI, sex debut, sex partners, transactional sex, pregnancy, early marriage
Secondary outcomes:	Pathways of effect for the CT
Study design:	Any type of study design that included data from individuals include abstracts and study protocols, opinion pieces and ecological studies were not included
Publication timeframe:	2010 -2021
Language of Publication:	English only
Exclusion Criteria	
Primary Interventions:	Educational support, vocational training

Primary Outcomes:	HIV treatment outcomes, gender-based violence, and mental health as primary outcomes of the study.

5.4.3 Data Extraction

A modified Critical Appraisal Skills Programme (CASP) checklist was used to extract data from the included papers to describe the study characteristics (country, authors, year of intervention, study name/description, study design, Study setting, study population, median age at baseline, population size (N), timeframe of results, study quality); the study interventions (CT intervention description, conditionality, cash amount, supportive interventions) and the outcomes of the studies (outcomes studied, SRH and HIV findings, other findings, pathways of effect).[291,292]

5.4.4 Data Analysis

Due to the heterogeneity of study designs and outcomes of the studies it was not possible to determine quantitative pooled numeric estimates. I, therefore, used narrative synthesis to determine trends and patterns of effectiveness of CTs and pathways of their effect.[293] I evaluated the quality of the quantitative studies by using the quality assessment criteria for randomised/quasi-experimental controlled trials adapted by Lassi and colleagues.[294] This method provides criteria for evaluating selection bias, performance bias, measurement bias and attrition and classifies each study into a high, medium or low-quality study.[294] For a paper to be classified as high, medium or low-quality it must score at least three (3) out of four (4) in that category. Studies that scored two points in high and two points in medium categories were classified as high/medium.

5.4.4 Ethics

The study design was discussed with community stakeholders and the DTHF associated local Community Advisory Board (CAB) before protocol finalisation. Ethics approval for the PhD study protocol received from the University of Cape Town Human Research Ethics Committee (HREC): HREC 716/2018 included ethics approval for this scoping review. This scoping review protocol was however not registered.

5.5 Results

This section will describe the studies selected, their characteristics and study quality. It will also describe the interventions evaluated with their outcomes and the pathways of their effect where described.

5.5.1 Study selection

I screened 166 citations and after reviewing the titles and abstracts I removed 131 articles that did not meet the entry criteria. Assisted by the librarian, I retrieved 35 articles and hand-

searched references to find other relevant articles. I found an additional 31 articles from the hand-search. I reported the included papers using the PRISMA guidelines as shown in Figure 10.[295]

5.5.2 Describing the studies and their quality.

Table 8 describes the study characteristics. I identified fifty-five papers for inclusion that were published between 2010-2021 in English that reported on 16 CT interventions in AGYW in ESA.

1. These interventions were in eight (8) countries in ESA: Eswatini (1), Kenya (3), Lesotho (1), Malawi (2), South Africa (5), Tanzania (2), Zambia (1), Zimbabwe (1).
2. Many of the studies included both in- and out-of-school AGYW living in both urban and rural areas.
3. These interventions were targeting mainly adolescent girls with only three (3) interventions in Tanzania, Lesotho and South Africa studying young women who are ≥20 years at baseline.
4. Many of the studies included both in- and out-of-school AGYW living in both urban and rural areas.
5. The studies targeting young women at baseline used UCTs in Kenya (Zoe) and lotteries in Eswatini or were conditional on the attendance of vocational/ higher education/ exams (Eswatini) or a negative STI test (Tanzania) with the CT disbursed directly to the young women.[296–300]
6. Most of the studies were of medium or high/medium quality.

The most common reasons for the studies scoring as medium or high/medium quality and not scoring as high quality was related to the nature of the research. The research was unable to conceal participants who receive the intervention; compared to being the controls, and potential confounding was introduced into the research and adjusted for statistically in the studies.

Two studies, one from Eswatini and the other from the CAPRISA group in South Africa, were classified as **low quality** despite having a good description of research methods, the effectiveness data were derived from conference abstracts without peer-reviewed articles.[297,301] Eight (8) were qualitative papers and most of them described the pathway of effects.

Figure 10: Search strategy PRISMA Diagram

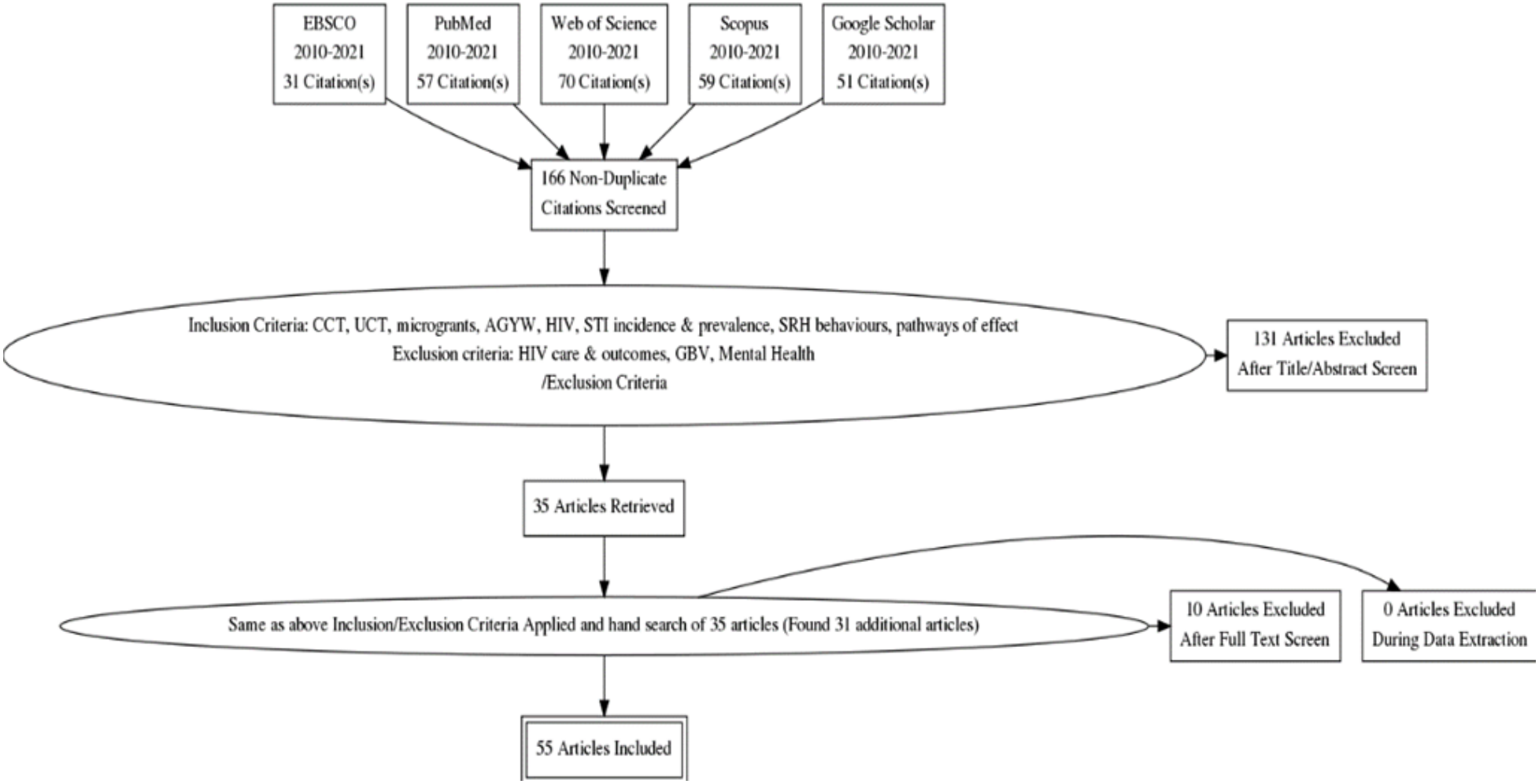


Table 8: Study Characteristics

Country	Authors	year	Study Name/description	study design	Study setting	Population	Median age at baseline (Females)	Pop. Size	Timeframe of results	Study quality
Eswatini	[296,297]	2015-2019		2X2 factorial Cluster Randomised Study	1.In- and out-of-school 2.Rural (80%)	15-22 y Female	18.22years	4389	3years	Low (abstract)
Kenya*	[302] [286] [303] [304]	2007-2011	Kenya CT-OVC	Cluster RCT	Urban and rural	15-25y Females OVC	17.69y (Treatment); 17.87 (Control)	1547	4years	Medium
Kenya	[298]	2014	ZOE Orphan Empowerment	Stratified cross-sectional study design	Not reported	<18y Females and Males OVC	18 – 19.5 y	1060 (66,6% Female)	2years	Medium
Kenya	[305–310]	2015-2019	Adolescent Girls Initiative-Kenya	Randomised Controlled trial	1.In- and out-of-school 2.Urban Informal 3.Rural	11 -14y Female	12,6y (Kiberia); 11.9y(Wajir)	4544	4 years (Includes 2 years post-intervention)	High/Medium

Country	Authors	year	Study Name/description	study design	Study setting	Population	Median age at baseline (Females)	Pop. Size	Timeframe of results	Study quality
Lesotho	[311]	2010 - 2013	Lesotho Lotteries	parallel group randomized trial.	4.Not reported	18-32y Male and Female	23.45y	3029 (68% female)	3 years (includes 1 year post-intervention)	High/Medium
Malawi	[221,312–317]	2007-2012	Schooling, Income, and Health Risk study (SIHR)/Zomba Trial	Cluster Randomised Controlled Trial	1.In-and out-of-school 2. Urban, rural, far rural	13 -22y Female	15.3y Intervention.; 15.1y Control	1289	5years (incl. 2 years post-intervention)	High/Medium
Malawi	[318,319]	2013-2015	Social Cash Transfer Programme (SCTP)	cRCT	1.Rural	14 -21 y Male and Females	16.38y	1023	2,5 y	High
South Africa	[127] [320] [321,322]	2009-2012	Child-focused state cash transfers	prospective observational study with random sampling	1.In- and out-of-school 2.Urban, rural	10-18years Male and Female	13.03y	3516 (57% Female)	1 year	High/Medium

Country	Authors	year	Study Name/description	study design	Study setting	Population	Median age at baseline (Females)	Pop. Size	Timeframe of results	Study quality
		1998 - 2008		Retrospective cohort		18-27y	22 years	866 (53,1% Female 1726 (59.1% Female) 4845	Cross-Sectional Cross-Sectional 10y	Medium Medium

Country	Authors	year	Study Name/description	study design	Study setting	Population	Median age at baseline (Females)	Pop. Size	Timeframe of results	Study quality
South Africa	[323] [216] [324]	2009-2012 2018	Cash-plus Care	prospective observational study with random sampling Qualitative	1.In- and out-of-school 2.Urban, rural	10-18years Male and Female	14.29y	3516 (57% Female) 2668 (56.1% Female)	1 year	High/Medium
South Africa	[301,325]	2010	CAPRISA 007	cRCT	1.In school 2.Rural	Grade 9-10	Not reported	3217 (52.7% Female)	3 years	Low (abstract)
South Africa	[287,326–331]	2011-2015	HPTN 068 Swa Koteka	RCT Qualitative	1.In school 2.Rural	13–20y Female	15 y	2430	3 years	High/Medium
South Africa (pathways)	[332]	2014-2015	Part of CHANGE study	Qualitative	1.In school 2.Urban	16-18y	N/A	120	1 year	N/A
Tanzania	[225,300,333,334]	2009-2010	RESPECT Study	RCT	1.Rural, semi-urban	18 -30y Male and Female	24.4y	2399 (50.2% Female)	1 year	High/Medium

Country	Authors	year	Study Name/description	study design	Study setting	Population	Median age at baseline (Females)	Pop. Size	Timeframe of results	Study quality
Tanzania (pathways)	[126,285,335–337]	2017-2018	PEPFAR DREAMS Sauti/WORTH+	Qualitative	1.Out-of-school 2.Urban and Rural	15 -23 y Female	N/A	80	1 year	N/A
Zambia	[318,338]	2013-2015	Multiple Category Targeted Grant (MCTG)	cRCT	1.Rural	14 -21 y Male and Females	16.90y	1070	3years	High
Zimbabwe	[255,256]	2006 - 2008	SHAZ! (Shaping the Health of Adolescents in Zimbabwe)	RCT	1.Urban 2.Out-of-school	16-19y Female OVC	18	315	2years	High/Medium

5.5.3 Describing the Interventions

Table 9 describes the sixteen interventions studied which included conditional and unconditional CTs, raffles and lotteries and micro-grants and loans. Young women are defined for this review as those older than median 18 years at baseline.

The studies targeting adolescent girls were either unconditional CTs such as government grants given to heads of households of orphans and vulnerable children (OVC) in Kenya and government child-focused grants given to households of children under 18 years.in South Africa.[302,339] The other unconditional CTs were part of research projects in South Africa (CHANGE project) and Malawi (Zomba trial) with cash disbursed to young women and disbursed to their parents.[221,332]

CCT were conditional on 80% school attendance in Kenya (Adolescent Girls Initiative), Malawi (Zomba Trial), South Africa (HPTN068; CHANGE) or conditional on the attendance of behaviour change interventions in Tanzania (Sauti/WORTH+) and South Africa (CAPRISA).[128,285,305,317,327] The Lesotho Lotteries, the Malawi Zomba trial and the Tanzania RESPECT Trial all evaluated different cash amounts whereas all the other studies evaluated only one amount.[300,311,317] Microgrants interventions in Zimbabwe (SHAZ) and Kenya (ZOE Orphan Empowerment) were conditional on a proposal/request sent to the locally elected group that was mandated to decide who gets these grants and the value granted.[256,298]

Some of the interventions included small gifts, refreshments, transport costs and referral services for STI, HIV and GBV. The Kenya OVC study also provided literacy training.[286]

Table 9: Study Interventions

Country	Authors	year	Study Name/ description	CT Intervention description	Conditionality	Cash Amount	Supportive interventions
Eswatini	[296,297]	2015-2019		1. conditional cash transfer to participant 2. raffle enrolment	1. Education attendance or registration for exams/ vocational/ higher education 2. Negative STI (Raffle) (frequency not reported)	a) E200 (~ 13.40 USD) for primary or secondary education per year b) E400 (~ 26.80 USD) per education term for attending more than 80% of their classes per term over the study c) E700 (~ 46.81 USD) for upgrading classes or short courses d) E700 (~ 46.81 USD) for applying for O level exams e) E700 (~ 46.81 USD) for registering at the university f) E700 (~ 46.81 USD) for sitting annual exam (university, vocation school or technical college) or finishing short course g) E2,900 (~ 193.94 USD) paid directly to public institution per	Not reported

Country	Authors	year	Study Name/ description	CT Intervention description	Conditionality	Cash Amount	Supportive interventions
						year to return to education institution. h) STI negative result eligible to win one of 80 prizes of E1000 (~ 67.00 USD) each.	
Kenya	[286,302–304]	2007-2011	Kenya CT-OVC	Unconditional cash transfer to OVC Household head	None	1500 Kenyan Shillings (USD $21), adj. to inflation Ksh 2000 per household in the 2011 20% of monthly total household expenditure	literacy training for those with low literacy from Wave 2
Kenya	[298]	2014	ZOE Orphan Empowerment	Conditional Cash Transfer to OVC Household head	Participant needs and survival strategies. Working Group majority vote decision.	Varied amounts not reported	

Country	Authors	year	Study Name/ description	CT Intervention description	Conditionality	Cash Amount	Supportive interventions
				Some groups gave microgrants as loans with revolving credit. **<u>Additional Interventions:</u>** 1. Weekly health and life skills education 2.Entrepreneurial training skills and business “start-up” kit			
Kenya	[305–310]	2015-2019	Adolescent Girls Initiative-Kenya	Conditional Cash Transfer to household **<u>Additional Interventions:</u>** 1. School fees (80% attendance) 2. School Incentive for each girl enrolled in CCT 3. School kit to participant: sanitary	80% School Attendance	2250 KES per term in Kibera, 2500 KES per term Wajir 10 % of average household expenditures for a 4-month period	

Country	Authors	year	Study Name/ description	CT Intervention description	Conditionality	Cash Amount	Supportive interventions
				towels, underwear, petroleum jelly, soap, exercise book pen 4. SRH and health education 5. Wealth education			
Lesotho	[311]	2010 - 2013	Lesotho Lotteries	Participant conditional entry into low or high-value lottery	Negative syphilis and trichomoniasis vaginalis test the week before the lottery draw	Low-value lottery 500 maloti ($50) OR? High-value lottery 1000 maloti ($100) every four months.	Treatment for STI if test positive; HIV positive referred for treatment. In kind incentive worth $3 for all participants (candles, matches, and washing powder)
Malawi	[221,312–317]	2007-2012	Schooling, Income, and Health Risk study (SIHR)/Zomba Trial	Conditional Cash Transfer to participant and parent UCT arm	80% school attendance	AGYW: ranging from US$1 to $5. Parents: ranging $4–10.	

Country	Authors	year	Study Name/ description	CT Intervention description	Conditionality	Cash Amount	Supportive interventions
Malawi	[318,319]	2013-2015	Social Cash Transfer Programme (SCTP)	Unconditional Cash transfer	None	Variable by household size & number of children in school (bimonthly) 18% of pre-program consumption	
South Africa	[127,320,321,324,340,341]	2009-2012	South African Child-focused state cash transfers	Unconditional Cash transfer to household with ≤ 18 years (CSG) or Foster Child Grant (FCG) to the household	None	CSG: ZAR250 per month 2010, ZAR280 per month in 2012; (US$35). FCG: ZAR710 per month 2010, ZAR770 per month 2012; (US$96).	
South Africa	[216,323]	2009-2012	Cash-plus Care	Unconditional Cash transfer to household with ≤ 18 years (Child Support Grant CSG) to the household **Additional interventions:**	None	ZAR250 per month 2010, ZAR280 per month in 2012; (US$35)	refreshments and certificates of participation Gender-based Violence referral HIV referral

Country	Authors	year	Study Name/ description	CT Intervention description	Conditionality	Cash Amount	Supportive interventions
				• Food support (e.g., school feeding, food gardens), • Free schooling and books 1. School Counselling 2. Teacher Support Care (e.g., positive parenting) 1. Old-age pension grant			
South Africa	[301,325]	2010	CAPRISA 007	Conditional Cash transfer to participant	1. Annual HIV Test 2. Sustainable Livelihood Programme (SLP) (My Life! My Future!) extra-curricular programme: 80% attendance,	R1750 (USD175) over 2 years ($7,3 per month) 1. R200 annual HIV test, 2. R50 every quarter participating in My Life	

Country	Authors	year	Study Name/ description	CT Intervention description	Conditionality	Cash Amount	Supportive interventions
					completion of project portfolio 3. Academic performance: maintained 50 % pass rates in mid- and year-end	My Future sessions, 3. R200 for project portfolio 4. R150 each for mid- and year-end academic performance 5. If met all conditionalities maximum of R1750.	
South Africa	[287,326–330]	2011-2015	HPTN 068 Swa Koteka	Conditional Cash Transfer to participant and parent UCT	80% school attendance	AGYW: R100 (USD 12) per month Parents: R200 (USD 24) per month	small gift at baseline visit "weekend camp" worth (USD3) HIV positive included to limit stigma
South Africa (pathways)	[332]	2014-2015	Part of CHANGE study	1.UCTs to participant 2.Conditional Cash Transfer to participant	1. UCT – no conditions 2.CCT – 80% school attendance	1. 280 ZAR (USD20) per month for 6 months (UCT and CCT)	

Country	Authors	year	Study Name/ description	CT Intervention description	Conditionality	Cash Amount	Supportive interventions
					3.CCT – single payment for once-off clinic visit involving sexual reproductive health education, services related to family planning and contraception, HIV counselling and testing, HIV risk assessment, and HIV risk reduction counselling.	2. single payment of 280 ZAR (once off clinic visit)	
Tanzania	225,300,333,334	2009-2010	RESPECT Study	Conditional cash transfer to participant	Negative STI test	low-value conditional cash transfer (eligible for $10 per testing round (#30 in total), and high- value conditional cash transfer (eligible for $20 per testing round %60 in total)).	
Tanzania	126,285,335–337	2017-2018	PEPFAR DREAMS Sauti/WORTH+	Conditional Cash transfer to participant **<u>Additional Interventions:</u>**	1.Completion of a 10-hour Behaviour Chane Communication curriculum (SRH, HIV, GBV)	TZS 70 000 ($31) every 3 months	TZS 5000 (USD 2) for transportation costs

Country	Authors	year	Study Name/ description	CT Intervention description	Conditionality	Cash Amount	Supportive interventions
				Upon completion of BCC: small group financial literacy and individual savings and loan programme called WORTH+.			
Zambia	318,338	2010-2013	Multiple Categorical Targeted Grant (MCTG)	Unconditional cash transfer to female/elderly headed/OVC/disabled member/critically vulnerable	None	Flat transfer of 120 kwacha [ZMW] (US$24), bimonthly (21% of pre-programme Consumption)	
Zimbabwe	255,256	2006 - 2008	SHAZ! (Shaping the Health of Adolescents in Zimbabwe)	Micro-grant to participant **Additional Interventions:** Access to SRH services 14-part life skills programme (SRH, HIV, relationships, GBV) 6 week home based care training for caring for people living with HIV.	Completion of vocational training and developing a business plan	Micro grant: capital equipment, supplies or additional training valued at $100 US dollars or less per participant.	

Country	Authors	year	Study Name/ description	CT Intervention description	Conditionality	Cash Amount	Supportive interventions
				Vocational training Livelihoods: 6-month financial literacy course Integrated social support (ISS): guidance counselling; and self-selected adult mentors			

5.5.4 Describing the Outcomes.

The outcomes of CT interventions are shown in Table 10. HIV prevalence and/or incidence was the primary outcome in five (5) studies; Eswatini and Lesotho (targeting young women), Malawi, SA (CAPRISA,HPTN 068) targeting adolescent girls.[297,301,311,317,327] Other outcomes evaluated are shown in Table 9 and summarised here.

HIV and STIs: In AGYW in Lesotho, HIV incidence and STI prevalence was reduced and sustained for at least a year post-intervention when conditionality of lottery entry was a negative STI test.[311] In Eswatini, HIV incidence was reduced when the CT was conditional on educational institution attendance. Entry into a raffle conditional on a negative STI raffle was not effective on its own, it amplified HIV reduction effects. There was however, no data testing durability of effects.[297] Lotteries and raffles conditional on negative STI tests seemed to show promise as an effective intervention to reduce HIV and STIs in the young women group. HIV reduction in adolescent school going girls following the CT that was unconditional or conditional on schooling was not found to be sustained more than two years post-intervention.[317]

Transactional sex: Reduction in transactional sex was observed in adolescent girls when households received UCTs in South Africa and when CTs was conditional on a behaviour change communication (BCC) intervention in Tanzania; there is however, no post-intervention follow up data for both studies; the CHANGE project in South Africa found that the initial reduction in transactional sex after CT disappeared immediately after the intervention.[126–128]

Risky sexual behaviours (incautious sex, unprotected sex, multiple partners): Reduced unprotected sex in South Africa was found when unconditional CTs were **augmented with other care** interventions or conditional on schooling, but with no post-intervention follow up data.[281,323] **Increasing exposure to unconditional CTs** in households in South Africa increased the likelihood of abstaining from sexual activity and decreased risky sexual activity.[218,323] However, the reduction in sexual activity found in the Zomba trial in Malawi was unsustained after more than two (2) years of follow up.[317]

Sexual debut: unconditional CTs given to Kenyan OVC households delayed sexual debut; however, there was no post-intervention follow-up data. The effect on sexual debut found in the Zomba study in Malawi was not sustained at follow up.[286,302,304,317] The Zomba trial in Malawi showed a reduction in delayed sexual debut; however, this was unsustained.[317]

Partner age/school status: UCTs in South African adolescent girls reduced partner age but there was no post-intervention follow up after completion.[127]

Pregnancy, delayed childbearing, fertility, marriage: CTs conditional on schooling in Malawi, after more than two (2)years postintervention follow up, showed sustained reduction

in marriage, fertility and increased educational attainment in AGYW who were not in school at baseline (dropouts).[317] This same effect on school going girls after unconditional CTs were achieved; however, not sustained after more than two years of follow up.[317]

Other studies in Zambia and Malawi found no impact of UCTs on early marriage and fertility outcomes.[318] There was a reduction in pregnancy but not early marriage in the UCT Kenya-OVC intervention; and this did not have a follow up post intervention study.[304] Even though these results are mixed, it is important to note that evidence from South Africa showed that the unconditional CT did not incentivise pregnancy but instead increased spacing between pregnancies in women who received these CTs.[322]

Table 10: Study Findings

Country	Authors	year	Study Name/description	Outcomes studied	SRH and HIV Findings	Other findings	Pathways of Effect
Eswatini	[296,297]	2015-2019		**Primary Outcome:** HIV-1 incidence at 3 years after study enrolment **Secondary Outcomes:** Trichomonas vaginalis and syphilis prevalence self- reported sexual behaviours	1. Reduction in HIV incidence 2. Raffle not effective alone but amplifies CT effect. 1		
Kenya	[286,302–304]	2007-2011	Kenya CT-OVC	**Primary Outcome:** Sexual debut	1. Delayed Sexual Debut 2. Reduces early pregnancy but no	Impacts larger in females than males and amplified in those without depressive symptoms and with high Hope scores	Schooling protective effect on sexual debut esp. for females Financial stability of the household

1 Interpret with caution, data from conference abstract only.

Country	Authors	year	Study Name/description	Outcomes studied	SRH and HIV Findings	Other findings	Pathways of Effect
				Secondary Outcomes Transactional sex Pregnancy Early marriage Partner age & school status	significant impact on early marriage. 3. No statistical significance: condom use, number of partners and transactional sex, partner age & school status		Mental Well-being and aspirations
Kenya	[298]	2014	ZOE Orphan Empowerment	Sexual debut unprotected last sex. multiple sex partners	CT not associated with sexual debut in any gender.	Programme participation delayed sexual debut and reduced unprotect sex. Self-efficacy and schooling reduced odds of unprotected sex	

Country	Authors	year	Study Name/description	Outcomes studied	SRH and HIV Findings	Other findings	Pathways of Effect
						Improved food consumption associated with increased unprotected last sex among females but not males.	
Kenya	[305–310]	2015-2019	Adolescent Girls Initiative-Kenya	**Primary Outcome** delayed childbearing (age at first birth, age at first sex and age at first marriage. **Secondary outcomes** Four domains of indicators: violence, education, health, wealth)	Cash Transfer not significantly associated with delayed childbearing	Cash Transfer plus Violence, education, health & wealth improved completion of primary school and transition to high school Health intervention improved SRH knowledge & condom self-efficacy	

Country	Authors	year	Study Name/description	Outcomes studied	SRH and HIV Findings	Other findings	Pathways of Effect
Lesotho	[311]	2010 - 2013	Lesotho Lotteries	HIV incidence & prevalence	Reduction in HIV incidence and HIV and STI prevalence HIV incidence reduced (High value lottery double the effect as the low value lottery, low value NS to controls) risky sexual acts & number of unprotected sexual acts reduced for every $1 increase in the expected prize. **1 year follow up:** reduction in HIV incidence, prevalence and STI prevalence sustained	STIs reduced in controls as well	lottery moderated behaviours of risk-loving individuals to like risk-averse individuals.
Malawi	[221,312–317]	2007-2012	Schooling, Income, and Health Risk study	**Primary outcomes:** HIV and herpes simplex virus 2	HIV and HSV2 prevalence reduced in baseline school going girls (NS in baseline drop out at 18 months	No difference in effect of HIV and HSV2 in UCT vs CCT	CCTs delay marriage in school dropouts through

Country	Authors	year	Study Name/description	Outcomes studied	SRH and HIV Findings	Other findings	Pathways of Effect
			(SIHR)/Zomba Trial	(HSV-2) prevalence **Secondary outcomes** syphilis prevalence, school enrolment, self-reported marriage, pregnancy, sexual behaviour, and knowledge of HIV/AIDS.	**Follow up: More than 2 years post end of intervention.** HIV and HSV2 reduction in baseline schoolgirls unstained Reduced onset of sexual activity and the likelihood of being sexually active unstained	CCT sustained reduction in marriage, fertility and increase education in baseline dropouts. UCT unstained decrease in marriage and pregnancy in baseline schoolgirls CT did not impact on age difference. Unstained decline in psychological distress in the UCT Psychological distress increases with increasing CT value to parent.	increased school enrolment. CCTs improved agency by increased their school participation. UCT income effect disappears when CT ends.

Country	Authors	year	Study Name/description	Outcomes studied	SRH and HIV Findings	Other findings	Pathways of Effect
						Reallocating some of the transfers from the parents to the girls would not improve programme impacts. Size of CT did not alter outcomes in the CCT arm.	
Malawi	[318]	2013-2015	Social Cash Transfer Programme (SCTP)	**Primary Outcomes** early marriage/cohabitation and fertility	no significant impact on early marriage and fertility outcomes		
South Africa	[127,320–322,324]	2009-2012	South African Child-focused	**Outcomes** Sexual activity		CT increases likelihood to abstain from alcohol and drug use.	

Country	Authors	year	Study Name/description	Outcomes studied	SRH and HIV Findings	Other findings	Pathways of Effect
			state cash transfers	Number of sex partners, Alcohol use, and drug use.	Reduced incidence of transactional sex and age-disparate sex No evidence that CSG increases pregnancy, increases spacing between pregnancies.	Increasing exposure to CSG increases likelihood of abstain from sexual activity decreases number of sexual and pregnancy decreases. Disconnections/ interruptions in CT associated increased. risky sexual behaviours and criminal activity; lower educational attainment a adolescent females are overall more likely to refrain from sexual inter- course than males,	

Country	Authors	year	Study Name/description	Outcomes studied	SRH and HIV Findings	Other findings	Pathways of Effect
South Africa	[216,323]	2009-2012	Cash-plus Care	incautious sex (males and females), economic sex (males and females), and pregnancy	CT reduced HIV risk behaviour	Cash-plus care (parental monitoring, school feeding, teacher support) amplified reduction in HIV-risk behaviour incidence and transactional sex vs control for both sexes.	Emotional connectedness, discipline and parental monitoring protective against risky sexual behaviour by promoting autonomy (self-governance, self-regulation) during adolescence), identity and independence
South Africa	[301,325]	2010	CAPRISA 007	**Primary Outcomes** HSV-2 and HIV. **Secondary Outcomes**	Reduced HSV-2 incidence[2]		

2 Interpret with caution – data from conference on abstract only.

Country	Authors	year	Study Name/description	Outcomes studied	SRH and HIV Findings	Other findings	Pathways of Effect
				Substance use and pregnancy rates			
South Africa	[287,326–331]	2011-2015	HPTN 068 Swa Koteka	**Primary Outcomes** HIV **Secondary Outcomes** HSV-2 Sexual risk behaviours	No impact on HIV and HSV-2 Reduced IPV and unprotected sex.	CCT also improved psychosocial well-being for young women from the poorest families but not the better off families. increase in economic well-being especially in poorest young women. no significant difference in permanent school dropout	CCT, HIV health information and testing services increased motivation for safer sexual behaviours. Increased economic agency, improved relationships (parental, sexual empowerment, gender attitudes) not engaging in sexual partnerships led to

Country	Authors	year	Study Name/description	Outcomes studied	SRH and HIV Findings	Other findings	Pathways of Effect
						No impact on school attendance but high school attendance in both groups. Young women attending <80% of school had increased HIV acquisition risk.	reduced opportunity for IPV. Cash-plus caregiver plus reduced depression reduced HIV more than cash only
South Africa (pathways)	[332]	2014-2015	Part of CHANGE study	acceptability and unintended consequences of CT strategies	reduce transactional sex	Cash benefits were short-lived only while receiving CT	Independence, financial freedom from older men
Tanzania	[225,300,333,334]	2009-2010	RESPECT Study	**Primary Outcome** STI prevalence **Secondary Outcome**	Reduction in combined STI prevalence for the $20 payments, but no $10 payments. No significant effect on HIV, Syphilis, HSV-2	Larger impact in low socio-economic and STI positive at baseline groups No significant impact impacts on self-reported sexual behaviours,	Learning effect attributed to sustained effect but no power to show this in changes in behaviour.

Country	Authors	year	Study Name/description	Outcomes studied	SRH and HIV Findings	Other findings	Pathways of Effect
				HIV, HSV2 and syphilis Sustained 1 year after discontinuation		CT has lower effect on reducing STI risk on women with lower relationship power, conditional cash transfer was. not sufficient to offset the larger structural determinants that leave these women less able to negotiate safer sex	
Tanzania	126,285,335–337	2017-2018	PEPFAR DREAMS Sauti/WORTH+	Role of a CT intervention in AGYW's decision-making,	Reductions in transactional sex, IPV, and risky-sexual behaviour[3]		Economic education and empowerment to reduce reliance on men. Hope and aspiration for

3 Data from qualitative results: The following population numbers are reported in different papers, 1429, 1433, 1547.

Country	Authors	year	Study Name/description	Outcomes studied	SRH and HIV Findings	Other findings	Pathways of Effect
				and pathways of effect of CT			a better future, access to knowledge increased agency and self-esteem and confidence in decision-making Emotional and social efficacy to build relationships & exit negative relationships. Self-Agency Economic Efficacy
Zambia	[318]	2011-2013	Multiple Categorical Targeted Grant (MCTG)	**Primary Outcomes** early marriage/cohabitation and fertility	no significant impact on early marriage and fertility outcomes		

5.5.5 Describing the Pathways of Effect

Pathways of effect extracted from the literature are shown in Table 10 above. CTs are shown to have a protective effect by **increasing access to education for AGYW** and thus **increasing their self-efficacy and agency** thus delaying sexual debut in Kenya-OVC; unprotected sex in the Kenya ZOE programme and delayed marriage in school drop outs in Malawi.[304,317,342] In South Africa, in the HPTN 068 trial, CT did not increase school attendance as baseline attendance was already very high even in the control group.[281]

When conditionality was based on a negative STI, a ***learning effect*** is attributed to the sustained effect even post withdrawal of the CTs. Similarly, the lottery moderated behaviours of risk-loving individuals to becoming similar to risk-averse individuals, a phenomenon that alludes to potential cognitive effects.[300,311]

The size of CTs did not seem to alter outcomes and the effects did not change if some of the CTs were reallocated to parents.[317] The Zomba trial in Malawi, in their end line evaluation, found that psychological distress in AGYW receiving CCT especially where the value of the CT was high, suggesting potential harm to AGYW if parents receive the grant as well.[314] These effects however, did not persist after 2 years follow up.[317]

Increasing exposure to UCTs in the household over time increased the likelihood of abstaining from sexual activity and decreased the number of sexual partners and pregnancy.[317,321] An UCT to households of AGYW in South Africa increased their likelihood to abstain from usage of alcohol and drugs and disconnections/interruptions in CTs were associated with increased risky sexual behaviours, criminal activity and lower educational attainment.[340]

Financial sustainability in households and the participants' increased economic agency and financial freedom and independence was shown to improve parental relationships, sexual empowerment and gender attitudes, with reduced reliance on men and increased safer sex behaviours.[128,285,286] The reduction of engagement in sexual partnerships with men led to reduced opportunity for IPV especially where the value of the CTs were high.[343]

UCTs *income effects* have however, been shown to disappear when CTs are removed as accumulation of physical or human capital may not yet have occurred.[317] It is therefore promising that **cash-plus other interventions** may be building the required physical and human capital. In South Africa, UCTs to the household augmented with parental care, discipline and parental monitoring improved safer sex behaviours by promoting emotional connectedness, autonomy, identity formation and independence in AGYW.[324] Child grants plus care with reduced depression in AGYW, amplified safer sex behaviours and were more effective than cash alone.[331]

Cash augmented with health information and testing services increased motivation for safer sex behaviours in South African adolescent girls.[327] Safer sex behaviours were shown to be amplified with increased **a*ccess to health knowledge; gaining hope and aspirations; improved*** **psychological well-being, emotional efficacy** and **increased *agency, self-esteem and confidence*** in decision-making and **improved relationships with parents and intimate partners**.

These pathways were particularly prevalent when CTs were augmented with care, health and livelihoods skills-building interventions.[126,286,287,336,337,342] Cash-plus interventions impact social and structural risk factors that drive HIV vulnerability in AGYW. In the Kenya ZOE programme, improved food consumption was associated with reduced unprotected sex.[342] CTs conditional on education augmented with community violence programmes, health & wealth skills programmes improved completion of primary school, transitioning to high school and SRH knowledge & condom self-efficacy.[307]

5.6 Discussion

Secondary literature was systematically evaluated to determine the effectiveness of CT interventions and pathways of these effects to reduce HIV vulnerability in AGYW in ESA. This secondary literature review was to inform a conceptual framework for the effect for the Women of Worth empowerment programme as a cash-plus intervention that may be relevant in other similar interventions and settings.

Changes in HIV incidence were only discernible in two programmes. In Eswatini, HIV incidence was reduced when the CT was conditional on educational institution attendance.[344] In Lesotho, HIV incidence was reduced and sustained for at least a year post-intervention when conditionality of lottery entry was a negative STI test.[311] CTs conditional on schooling were durable two years or more post-intervention in reducing early marriage, fertility, pregnancy and early sexual debut, in girls not in school at baseline (dropouts).[307,317]

The evidence is therefore still emerging for the effectiveness of CTs in HIV prevention in AGYW in ESA and where available durable evidence is lacking. This resonates with findings from others.[149,212,220,288,289] There were 55 papers reporting on 16 interventions in eight (8) countries in ESA and only four (4) studies tested durability of effects after CTs were removed.[128,317]

These findings are important as they respond directly to the African Union developmental priorities of reducing early marriage and adolescent pregnancy and shows the potential for CTs in advancing this agenda especially for out-of-school youth.[67]

There is promising evidence of sustained reduction in HIV incidence and STI prevalence in young women especially those from the lowest socio-economic status when entry into lotteries and raffles (particularly of a higher value) was conditional on a negative STI test. The moderately sustained effect, though only for a year, in the negative STI conditionalities has been attributed to a learning effect that participants gained by engaging in the programme.[300,311] A Zimbabwean study found lotteries conditional on HIV testing of children (gender not specified) to be effective; however, the study had a short follow up time.[345]

The evidence for the use of lotteries as part of CT programmes is emerging and in the Lesotho study, the lottery was not compared against a CT so we do not know if lotteries are better than CTs or not.[311] We don't know how durable this effect will be because the "learning effect" of a negative STI results to prevent HIV which is a relatively long-term risk and is likely to wane due to the more immediate risks of financial need.[213] Nonetheless, lotteries may have the potential to be a quick scalable solution to introduce safe sexual behaviour in challenging contexts but this would need to be augmented with other interventions to ensure durability and longevity.[346]

In the Malawian study, however, most effects on HIV vulnerability that were due to UCTs disappeared after the UCT was discontinued after more than two years.[317] Even though several studies showed the effectiveness of UCTs on risky sex behaviours; these studies do not have adequate durability of evidence.[127,216,286,302,304,317,323,327] The withdrawal of the UCT income effects in the studies evaluated is attributed to the limited accumulation of physical or human capital to respond to the social and structural drivers of HIV while receiving relatively small amounts of cash ranging from 10-21% of consumption/expenditure in the studies reviewed.[317]

Even though the impact of UCTs on risky sex behaviours by AGYW wanes upon removal, school enrolment has shown to increase due to CT was protective against HIV.[128,317] Furthermore, increasing the number of years AGYW are exposed to UCTs and limiting discontinuations has been shown to decrease risky sexual behaviours, promote abstinence from alcohol and drug use, reduce criminal activity and increase educational attainment.[216,218,321,323,327] Furthermore, UCTs do not promote pregnancies and have in fact resulted in increased spacing between pregnancies.[347] This suggests that even though the effects of UCTs waned upon removal, they may serve to protect adolescents during their developmental transition by keeping them in school and limiting risky sex behaviours during this time.

Strong global evidence exists on the effectiveness of UCTs in human development over an extended period. In Brazil nearly 30% of household inequality reduction over a 10-year period,

while Mexico and South Africa reduced their poverty gap by 20% and 47%, respectively.[207,215] Household economic well-being, child health and nutrition due to UCTs improved in Paraguay, Zambia, Malawi, South Africa and many other countries.[207,215] Even in this review, UCTs impacted positively on economic well-being, food security, education and other developmental benefits of AGYW especially those from the poorest families, deterring HIV upstream, at the structural determinants' level.[126,256,278,299,307,321,326,327,342,348]

We know that structural determinants are important risk factors for increased HIV vulnerability.[218,284] For example, food insecurity is associated with increased STIs and the onset of risky sexual behaviours.[284] Since most countries providing UCTs at scale to AGYW provide these only up to 18 years, UCTs remain an important tool to address structural determinants and address risky sex behaviours while AGYW are exposed to them. This, therefore, suggests that even though this evidence shows the waning effects of UCTs, the role of UCTs in reducing HIV vulnerability cannot be discounted even in the face of these mixed emerging results.[284,334]

While CCTs also show promise, they have a potential cost of leaving the most vulnerable out. For example, in Liberia AGYW that did not have adequate literacy were excluded and in HPTN068 in Mpumalanga out-of-school and pregnant girls were excluded, in both instances those excluded were likely even more vulnerable.[299,327,349]

Most of the literature on CTs and HIV vulnerability in AGYW is from Africa; however, evidence from Mexico where CTs were conditional on school attendance showed delays in pre-marital sex over a two-year period on the "Oportunidades" programme. This finding, however, is not supported by durability data.[350] The "Yo Puedo" programme gave cash conditional of attendance of a short 6-month SRH and life skills programme and access to YFHS for AGYW in San Francisco, USA. In a follow-up study which was done after 6 months, it showed mixed results with lower odds of having sex but lower contraception self-efficacy and motivation.[351]

The second objective of this review was to understand the pathways of effect for CTs. UCTs have been shown to improve adolescent girls' grade attainment and reduce the gap between those whose mothers have better education.[215,278–280] Even though the South Africa HPTN 068 study did not show the effectiveness of CTs on HIV they showed that AGYW attending <80% of school had increased HIV acquisition risk.[281,282] This link between reduced HIV vulnerability with increasing education and the resultant hope and aspiration for the future is well documented.[149,215,283,284]

Evidence of the effectiveness of CTs to improve education access show that CTs are more effective when conditional on school attendance but educational achievement was not improved suggesting that other interventions are required to improve the quality of education.[149,215] CT seem to improve their performance on risky sex behaviours when

augmented with interventions with other “human development” effects such as education, care and psychological well-being interventions or health and livelihood information and skills interventions.[122,215,286,298,324]

Both CCTs and UCTs contribute towards financial sustainability in households and participants’ increased economic agency and independence.[128,285,286] This financial sustainability in the household resulting from CTs, improved relationships with parents and improved gender attitudes as more AGYW get better educated and improved their livelihoods.[128,285–287] The financial independence from the CTs given to young women improved their relationship with intimate partners, with improved negotiation power and reduced reliance on men.[128,285,287]

These findings on the pathways of effect especially when CTs are augmented with other human development interventions are promising as they address some of the AGYW inherent desires for stable transitions into adulthood. Literature on pathways of effect is particularly sparse but nonetheless very important in determining the theory of change for CTs.[196]

Evidence on cash-plus other interventions is also limited but seems to show promise when UCTs are augmented with parental care, discipline and parental monitoring promoted emotional connectedness, autonomy, identity formation and independence in AGYW.[324]

Others have shown the importance of parental care depicted by eating meals together, the ability to discuss personal matters with parents and being provided pocket money for financial independence in reducing HIV vulnerability.[352] Increased access to health knowledge and interventions that give AGYW hope and aspirations for the future and build their confidence, self-esteem and agency have also been shown to form important pathways that could promote inherent motivation and durability of effect.[126,215,286,287,336,337,342] Fieno and colleagues have called for the development of CTs as “social vaccines” that have long-lasting developmental effects which are augmented by other human development interventions instead of “financial vaccines” that have limited longevity of “income effects”.[212]

Most of the studies reviewed focused on adolescent girls with much fewer studies that reviewed interventions targeting young women and evaluating cash-plus interventions. This confirms a need for more research into this age group and this kind of CT intervention and the relevance of my PhD research.[62,289,353]

The summary of the evidence for the effectiveness of CTs in HIV preventing in AGYW in ESA therefore suggests that:

1. The effects of UCTs given to the household wane after their removal but their protective effect cannot be discounted while AGYW are receiving them.

2. CCTs on school attendance may be more effective in contexts of low education access and could be impactful in reintegrating out-of-school youth into school and preventing HIV.
3. CTs given to AGYW may be more effective than if given to adolescent boys and young men where an increase in disposable income may increase risky sex.
4. AGYW with lower power relationships may require higher value CTs given to them to impact HIV vulnerability.
5. CTs seem to be more effective when combined with other human development interventions, such as in cash-plus interventions, the evidence for this is however limited.
6. For CTs to be more effective, they may need to be augmented with care and health and livelihood skills-building interventions and supply-side interventions that make HIV services accessible have also been recommended to augment CTs.[220]

Regarding the pathways of effect for CTs to prevent HIV in AGYW; even though the evidence is showing some pointers of these pathways of effect for CT, the generalisability of this evidence needs to be done with caution with due consideration of the socio-demographic context. The results from the evaluation of the effectiveness of Women of Worth empowerment programme and its pathways of effect will contribute to increasing this knowledge base.

The confounding contextual and individual factors in the different CT study settings such as levels of inequity, access to social services, cultural and religious beliefs, gender norms and human rights violations are thought to impact pathways of effect and give rise to heterogeneous findings of CT studies.[149] CCT on school attendance in South Africa were found to be less effective than in Malawi because of relatively high levels of existing education access in South Africa compared to Malawi is a good example of the effects of contextual factors.[354] Similarly, in Malawi, women who received cash conditional on a negative HIV result reduced risky sexual behaviour whereas risky sexual behaviour increased in men likely due to increased disposable income.[314] This differential gender impact of CTs was also observed in Johannesburg, South Africa.[128] In Tanzania in the RESPECT trial a CCT on a neg STI test was effective in reducing HIV and HSV2 incidence in men but not in women suggesting that the cash value could have been too low to overcome the structural determinants of the safe sex decisions in women compared to men.[333] Furthermore, this study found that a low value CT conditional on negative STI resulted in women with lower power relationships having higher STI risk, suggesting that women with lower relationship power might require higher cash values to change HIV vulnerability.[333]

Other authors have cautioned that CTs are not magic bullets on their own but are still an important arsenal against HIV especially when part of combination interventions even with other sectors.[148,190,223,349,355] The design of CT interventions, their implementation and the context in which these interventions are implemented can play an important factor in the effectiveness of CT interventions.[149,289] Moreover, the UNAIDS advises that CTs may not be effective in contexts where access to social grants and education are already high but could work in specific vulnerable or excluded groups.[54]

A review of CTs and other layered HIV interventions for AGYW in Africa has found that their effectiveness is affected by intervention design, community acceptance, other macro-economic and political contextual issues.[249,250] This suggests that more research is required for us to better understand how CTs work and how we can maximise their impact to reduce HIV vulnerability.

Findings that AGYW inherently desire a positive social image, power balance and respect in relationships with parents and intimate partners, emotional and economic independence and the knowledge and competence for decision-making can guide researchers in the design of CT interventions and conditionalities that are broader than financial instruments and have more durable effectiveness on reducing HIV vulnerability in AGYW.[337,356,357]

A few studies have used innovative conditionalities to build on these desires with promising results. The Sauti/WORTH+ intervention in Tanzania that has shown early results of reducing transactional sex when CTs were conditional on completing a 10 hour BCC curriculum (SRH, HIV, GBV) then attending a financial literacy skills with access to loans over an 18 month period.[336] Similarly the CAPRISA study included conditionality of a attendance of a BCC intervention and was effective in reducing HSV2, but it was not powered to detect HIV reduction, the SHAZ project in Zimbabwe gave micro-grants conditional vocational and business development training, that was also effective in reducing risky sex behaviours including transactional sex.[301] In Liberia, however, where conditionality was on attendance of a skills livelihood programme, there was no impact on HIV vulnerability.[299]

CTs to reduce HIV vulnerability in AGYW still require further research on durability for effects to be more convincing. Researchers should explore innovative conditionalities for CCTs that would be cost-effective and durable to reduce HIV vulnerability in young women particularly those not in school.

This review adds to the growing evidence on the use of CTs in addressing HIV vulnerability in AGYW in Africa. However, there is a likelihood that our search had a publication bias. I only reviewed articles written in English and thus could have missed literature in other languages especially from Lusophone countries such as Mozambique.[207] To ensure comprehensiveness

of the review, the review was extended to include CT and other cash incentives such as lotteries, raffles and micro-finance programmes which have also been used in Africa to address HIV vulnerability. This scoping review was also limited in that it did not review funding sources of each of the studies that may have also introduced bias.

5.7 Conclusion

The evidence for the effectiveness of CTs in reducing HIV and risky sexual behaviours young women in ESA is limited. However, there is emerging promising evidence that when CTs are combined with education, care, parental support; health and livelihoods skills-building initiatives the overall outcome is positive. This evidence is however hampered by the limited evaluation of durability. Similarly, the evidence for the pathways of effect for these CTs is also limited and confounded by contextual factors. More research is therefore required from multiple settings and contexts for us to better understand how CTs could work and how we can maximise their impact in different contexts to reduce HIV vulnerability in AGYW in ESA.

5.8 Relevance for this research

The scoping review of the effectiveness of CT interventions and their pathways of effect to reduce HIV vulnerability in young women revealed promising but limited evidence to support cash-plus interventions in combination with other human capacity development interventions such as care, parental support; health and livelihoods skills-building initiatives. All of this provides a rationale for the Women of Worth programme which is the cornerstone of this research.

CTs are already popular policy instruments and the lessons and evidence from Women of Worth empowerment programme could resonate in the policy space in similar settings, as these policy instruments are improved, made more equitable and accessible for larger population impact.

In the next chapter, the research aims, objectives and methods used to evaluate the Women of Worth programme are described.

CHAPTER 6: Research Methods

6.1 Introduction

In this chapter, the research methods for the evaluation of the Women of Worth intervention are explained. These methods evaluated the theory of change for the WoW intervention that is as explained in chapter four. The Theory of Change is a planning and evaluation method that provides a working model (programmatic logic) for testing the research conceptual framework on how an intervention is likely to work in the real world.

The research aim and the specific objectives are detailed below with the setting and the population being studied described. Furthermore, the research study procedures and analytical methods used for each of the study objectives are detailed.

6.2 Research aim

The Women of Worth empowerment programme as designed using the conceptual framework for effective behaviour change interventions explained in chapter four was a combination intervention of empowerment sessions and access to youth friendly SRH services to reduce HIV vulnerability in young women aged 19-24 years in Cape Town, South Africa. This research assesses the Women of Worth empowerment program and evaluates the effectiveness of a CT of ZAR300 (USD22) conditional on attending a 12-session empowerment intervention to improve SRH/HIV outcomes reducing HIV infection and moderating biological, behavioural and socio-demographic risk factors in young women aged 19-24 in Cape Town, South Africa.

6.3 Specific objectives

Specific Objective 1: To determine implementation factors that promote scaling up of sustained engagement of young women 19-24 years in Women of Worth empowerment programme. In the rest of this manuscript, this specific objective is referred to as; “To determine implementation factors that promote scaling up of sustained engagement.”

Specific Objective 2: To determine implementation fidelity of the Women of Worth empowerment programme intervention. Moving forward, this specific objective is referred to as; “To determine implementation fidelity.”

Specific Objective 3: To determine the effectiveness of conditional CTs in reducing HIV infection and moderating biological, behavioural and socio-demographic risk factors in women receiving the Women of Worth empowerment programme intervention. Hereafter, this specific objective is referred to as; “To determine effectiveness.”

Specific Objective 4: To determine the pathways of effect for the Women of Worth empowerment programme intervention effect including the CTs in reducing HIV vulnerability

in young women 19-24 years in Cape Town, South Africa. In the rest of this manuscript this specific objective is referred to as; “To determine pathways of effect.”

6.4 The setting

The study sites for Women of Worth empowerment programme were in Klipfontein and Mitchell’s Plain sub-districts in Cape Town, South Africa. The area comprises 23% of the Cape Town metropolitan population and, the majority of residents have high dependency on state social grants and social services.[358,359] These sub-districts have a combined population of about 1 million living in both formal and informal urban settlements characterised by high levels of HIV, crime, violence and socioeconomic deprivation.[359,360] The antenatal HIV prevalence in Klipfontein and Mitchell’s Plain is 23.1% and 15,8% respectively.[360] The Mitchell’s Plain and Nyanga police precincts in the study area are in the top ten (10) worst police precincts for total crimes in South Africa.[361] Most of the population are historically African Black and Coloured and are isiXhosa or Afrikaans/English speaking respectively. The programme was delivered in 10 community venues distributed across the two sub-districts that included community centres, churches and NGO venues.

6.5 Study population

Women of Worth empowerment programme was intended for 10 000 young women aged 19-24 years which approximates to 10% of the population in this age group in these two sub districts.[362]

6.6 Recruitment

The Women of Worth empowerment programme evaluation study was implemented in three phases, the pilot phase (Phase 1a), the post-modification phase (Phase 1b) and the demonstration phase (Phase 2). Recruitment of participants prior to Phase 1b was done through referrals from community outreach teams working door to door, local NGO’s, health facilities, local media and social media networks. During Phase 1b recruitment referrals as done before were still accepted but there was a greater emphasis on using word of mouth and incentivising referrals from the participants. From Phase1b, a Women of Worth Sister’s programme was introduced where a Women of Worth graduate could refer up to a maximum of five (5) participants and receive a ZAR100 (about USD5) cash incentive in total.

6.7 Study entry and exclusion criteria

In all phases, at registration participants had to live in Klipfontein and Mitchell’s Plain regardless of duration of stay in the community. HIV status was not an exclusionary criterion, nor was it required that participants had a bank account. However, participants had to own or have access to a mobile phone to facilitate payment. Participation was voluntary and in

response to community and local media recruitment drives and entry into the programme was on a first come, first served basis.

6.8 The Women of Worth empowerment programme intervention

The Women of Worth empowerment programme intervention included a **"care" arm component that consisted of:**

1. A facilitator-led behaviour change intervention of 12 Women of Worth empowerment programme session sessions adapted from several effective programmes including Stepping Stones, IMAGE, Girl Power, etc. The content titles are shown in Table 1 in the conceptual framework chapter and Table 12 at the end of this chapter.
2. Enhanced access to YFHS with promotion of HIV testing, contraception services, ART and HIV PreP through mobile clinic provision and introduction to youth-friendly clinics in the sub-district.
3. Access to other support services such as psychosocial services and a computer internet café.
4. Participants assigned to the **"Cash + care arm"** in addition to the care components received a CT of ZAR300 (about USD22) per session conditional on completed attendance of a BI session. This amounted to a total of R3600 on completion of all 12 specific sessions.

6.9 Evaluation design

Evaluation of the Women of Worth empowerment programme used a multi-phase, experimental mixed methods study design to evaluate the theory of change . This study designed to evaluate the Women of Worth empowerment programme can be described as an effectiveness-implementation hybrid type I study design, to fulfil both the effectiveness and implementation objectives of this research.[13,14] The mixed methods included implementation science methods and qualitative methods.

The Women of Worth empowerment programme evaluation study was undertaken from May 2017 to December 2019. It had four components.

1. a randomised component where participants were randomised 1:1 in the "care" and the "care plus cash" arms to test the effectiveness of the CT on SRH/HIV outcomes.in two phases.
    a. a pilot phase called Phase 1a with BI attended monthly.
    b. the post-modification phase called Phase 1b with BI attended weekly.
2. The open label component to demonstrate scale-up called Phase 2 with BI attended weekly with only a "care plus cash arm" included and had no randomisation .

3. A sub-study using qualitative and other quantitative research methods that was used to determine the pathways of effectiveness for the intervention to understand how the Women of Worth empowerment programme intervention could have impacted SRH/HIV outcomes.
4. The use of implementation science tools to optimise programme engagement and evaluate implementation fidelity.

6.9.1 Study design for each objective

The mixed methods used in the different objectives are described in detail here and summarised in Table 14 at the end of this section.

6.9.1.1 Specific Objective 1: To determine implementation factors that promote scaling up of sustained engagement.

Outcomes: The study adaptations in the RE-AIM Framework and measured programme uptake, retention, and efficiency by study phase.

Sample Size: 10 000 participants. This sample size for the research was predetermined by the programme funder.

Study Phases: Phase 1a,b and 2

After enrolling approximately 1000 participants in the pilot phase (Phase 1a) for 6 months in 2017 where Women of Worth empowerment programme sessions were attended monthly; the programme was reviewed, and implementation indicators showed significant uptake and retention deficits (2% of participants were retained). The programme was thus paused, and efforts were undertaken to optimise both uptake and retention.

The RE-AIM Framework is an implementation science tool that is recommended to plan and evaluate successful uptake of interventions in the real world.[363,364] Over the four-month pause period, staff and participant consultations were held to optimise the programme between December 2017 and March 2018. Study modifications aimed to improve reach and coverage of qualifying participants; to improve the adoption of the intervention by participants, improve implementation by facilitators and promote the maintenance of the changes made over time.[364]

Phase 1b post-modification was the main randomised component with 4000 intended participants and BI attended weekly. Phase 2 was the open label component of the programme with 5000 intended participants, BI weekly to demonstrate scale-up that only included a “care plus cash arm” and had no randomisation.

Table 11 shows the study phases, samples sizes, randomisation status and Women of Worth empowerment programme session attendance.

Table 11: Research Phases of Women of Worth empowerment programme trial

Research Study Phase		N (intended)	Randomisation	Study Arms	BI Attendance schedule
Part 1 Pilot: Phase 1a	May '17 – Dec '17	1000	yes	"Care" YFHS+behavioural intervention (BI). "YFHS+BI+ cash transfer	Monthly
Part 2 Post modification: Phase1b	April '18 – Mar 19	4000	yes	YFHS+behavioural intervention (BI). YFHS+BI+ cash transfer	Weekly
Part 3 Open label: Phase 2	April '19 – December '19 Demonstration	5000	No	YFHS+BI+ cash transfer	Weekly

Data collection: Programme records and biometric attendance registers were used to collect data on uptake, retention, and efficiency.

1. **Programme uptake** (registration and programme initiation): defined as those who had registered, provided consent, completed a baseline questionnaire and started at least one Women of Worth empowerment programme session.
2. **Programme retention**: defined as those who completed at least 11 Women of Worth empowerment programme sessions
3. **Study Phase Efficiency**: measured by the median number of weeks to complete the programme by study phase and randomised controlled trial (RCT) arm.

Loss to follow up (LTFU) management: In the last three (3) months of the project participants that had 7 sessions or less to re-engage with the programme were called. The cut-off on the number of sessions still outstanding was determined by the available capacity in the project. We conducted just under 2000 telephonic calls to understand reasons for LTFU. Reasons for non-attendance into four groups: a) participant not reached despite 3 attempts b) participant working or in school c) participant promised to return to sessions d) participant expressed no longer interested were classified. This was to understand whether any other modifications to the programme could increase attendance and was performed before unblinding, and information on the randomisation arm was not captured. The calls were disaggregated into those participants who had only completed one session and those who

had completed at least 2 and not more than 7 sessions to understand if reasons for not completing graduation were different in these two groups.

Data analysis: To analyse the impact of study modifications on uptake, retention, and efficiency, I compared the outcomes during pilot Phase 1a with outcomes during the main randomisation phase, Phase 1b. I computed logistic regression models with 1) initiation and 2) retention (Women of Worth empowerment programme Completion (≥11 sessions) as the main predictors in each of the models with the explanatory variables being study phase and randomisations status. I used Stata 15.1 for all analyses.[365]

6.9.1.2 Specific Objective 2: To determine implementation fidelity.

Outcomes: Implementation Scores by domain (Medians and proportions)

Sample size: 10 Community venues providing 12 Women of Worth facilitated sessions with approximately 24 young women in each session.

Study Design: Serial cross section study design.

Data Collection: To assess fidelity a standardised tool was utilised (Appendix F). This included four main domains using 1) a 1-5 Likert-scale where 1 was least agreement – 5 most agreement and 2) Binary (Yes/No) questions. The four domains were based on the adaptations made using the RE-AIM framework and the training provided to facilitators and their administrative staff. These domains were assessing whether the adaptations made were being adhered to consistently during implementation. The four domains were:

1. **Practical considerations**: assessment of the facilitation space for appropriateness for open, reflective, group conversation and efficient service delivery on site.
2. **Facilitation practice of facilitators:** assessment of the application of active listening and empathetic engagement during session delivery
3. **Intervention delivery:** assessment of the delivery of the predetermined key minimum messages of the sessions
4. **Adoption and promotion of implementation modifications:** assessment of whether study modifications were adopted and implemented by facilitators, who had been trained on these modifications.

Direct observation of the Women of Worth empowerment programme sessions by two adjudicators used the fidelity assessment tool to monitor session quality. The adjudicators de-briefed and agreed on consensus scores immediately after the assessment and then gave feedback to the site team to ensure continuous quality and skills improvement of the site team. Facilitators were trained prior to the use of the fidelity instrument to ensure its use was developmental and not punitive. Training and enhanced support was offered to the facilitators through ongoing facilitator training, technical updates, mentoring and on-site self-development

coaching. The study team held weekly team meetings that included facilitators for shared learning. The findings of the fidelity assessment observations were used to assess the extent to which the study improvements for optimisation were implemented. These data were not collected during the pilot phase and these data were only systematically collected after the pilot phase and after modifications.

Data Management and Analysis: Median scores for Likert scores and numbers and proportions were used to describe binary data by domain and were calculated from serial fidelity assessments using Microsoft Excel.

6.9.1.3 Specific Objective 3: To determine effectiveness.

Methods for this objective have been published and the descriptions below are adapted from the publication and expanded on.[366]

Outcomes: Table 12 below shows the definitions of the study primary outcome: self-reported changes in HIV prevalence and secondary outcomes: self-reported SRH/HIV related risk factors measured after exposure to Women of Worth empowerment programme sessions.

Table 12: Outcome definitions: self-reported outcomes on completion of Women of Worth empowerment programme intervention and the extended follow-up.

	Numerator	Denominator
Primary Outcome		
HIV Positive	Number of participants self-reporting to have ever tested HIV positive	Total number of participants who have ever tested for HIV (by phase and randomisation arm)
Secondary Outcomes: Sexual Reproductive Health Behaviours		
Tested for HIV in last 6 months	Number of participants self-reporting to have ever tested for HIV.	Total number of participants enrolled (by phase and randomisation arm)
Condom use at Last Sex	Number of participants self-reporting to have used condoms the last time they had sex	Total number of participants enrolled (by phase and randomisation arm)
High HIV Risk Perception	Number of participants self-reporting that they think they are likely to or are certain that they will get HIV in the next year	Total number of participants enrolled (by phase and randomisation arm)
Current Contraception:	Number of participants self-reporting to be currently using contraception.	Total number of participants enrolled (by phase and randomisation arm)

Treated STI in last 6 months	Number of participants self-reporting to have ever been treated for STI in the last 6 months	Total number of participants enrolled (by phase and randomisation arm)
Secondary Outcomes: Structural Determinants		
GBV threat	Number of participants self-reporting that the current (or last) partner ever threatened to hurt or harm them or someone they care about	Total number of participants enrolled (by phase and randomisation arm)
Forced Sex ever	Number of participants self-reporting to ever been forced to have sex or preform sexual acts when you did not want to	Total number of participants enrolled (by phase and randomisation arm)
Transactional sex ever	Number of participants self-reporting to have ever felt like they had to have sex with a partner because they gave the participant money, drinks or other favours	Total number of participants enrolled (by phase and randomisation arm)
Employed	Number of participants self-reporting to be currently employed	Total number of participants enrolled (by phase and randomisation arm)
Overall health facility satisfaction	Number of participants self-rated the overall experience of the last visit they made to a health facility as good or very good.	Total number of participants enrolled (by phase and randomisation arm)

Sample size: 5000 participants at a 1:1 ratio in the “care” vs “C+C” groups

Study Power: A sensitivity analysis of the sample sizes required to show changes in HIV incidence compared to national trends was undertaken to determine the study power. The latest reported national HIV incidence for AGYW 15-24years in South Africa was 1,51% in 2017 showing a 26% reduction in incidence from 2,04% in 2012.[36] I assumed the same rate of reduction in HIV incidence to 2019 pro-rated over 2 years from 2017 to be 1.353%. A sensitivity analysis to determine the minimum sample size for two independent means with a 1:1 ratio in the “care” and “C+C” groups to show 5%; 7,5%; 10% and 12,5% impact of the CT in the Women of Worth empowerment programme on HIV incidence of 1.353% at 0.05 alpha and 80% power was calculated using STATA 15.[365] The computed sample sizes in the sensitivity analysis are in Table 13 and showed that the study sample size would elucidate an

additional reduction in HIV incidence as a result of the CT of between 5-7.5% compared to not receiving the CT.

Table 133: Sensitivity analysis for minimum sample size requirement and potential impact on HIV incidence at 30 months

		Sample Size	**Estimated HIV incidence in 2019 (%)**			**Sample Size**	**Estimated HIV incidence in 2019 (%)**
Sensitivity analysis 1 (5 % impact)	Care	3396	1.353	**Sensitivity analysis 3 (10% impact)**	Care	863	1.353
	C+C	3396	1.285		C+C	863	1.218
	Total	**6792**			**Total**	**1726**	
Sensitivity analysis 2 (7,5% impact)	Care	2394	1,353	**Sensitivity analysis 4 (12,5% impact)**	Care	551	1,353
	C+C	2394	1.251		C+C	551	1.184
	Total	**4788**			**Total**	**1102**	

Study Phases: Phase 1a and 1b

Study Design: Randomised Controlled trial of women aged 19-24 years who were randomised 1:1 to receive the intervention with a CT ("cash + care" or C+C) or without a CT (“Care”). RCT’s are a gold standard for evaluating the effectiveness of the interventions and since one of our key aims was to determine the effectiveness of the CT vs no CT, the RCT design was chosen.

Study Arms: “Cash plus Care “ vs “Care” only

Data collection: All Women of Worth empowerment programme participants provided informed consent at registration and then completed a baseline self-administered questionnaire assessing socio-demographics and multiple outcomes in sexual risk behaviour, education and employment (definitions found in Appendix E). This was done on a digital tablet using a biometric registration system via participant fingerprint and skip patterns and algorithms to minimise poor data collection.

After this, participants were assigned a unique participant identification number (PID) referred to as a ‘client code’. The study collected self-reported data from all participants who consented, registered and provided a baseline questionnaire. **Completed attendance** at empowerment sessions was collected on the biometric registration systems with back-up paper registration forms.

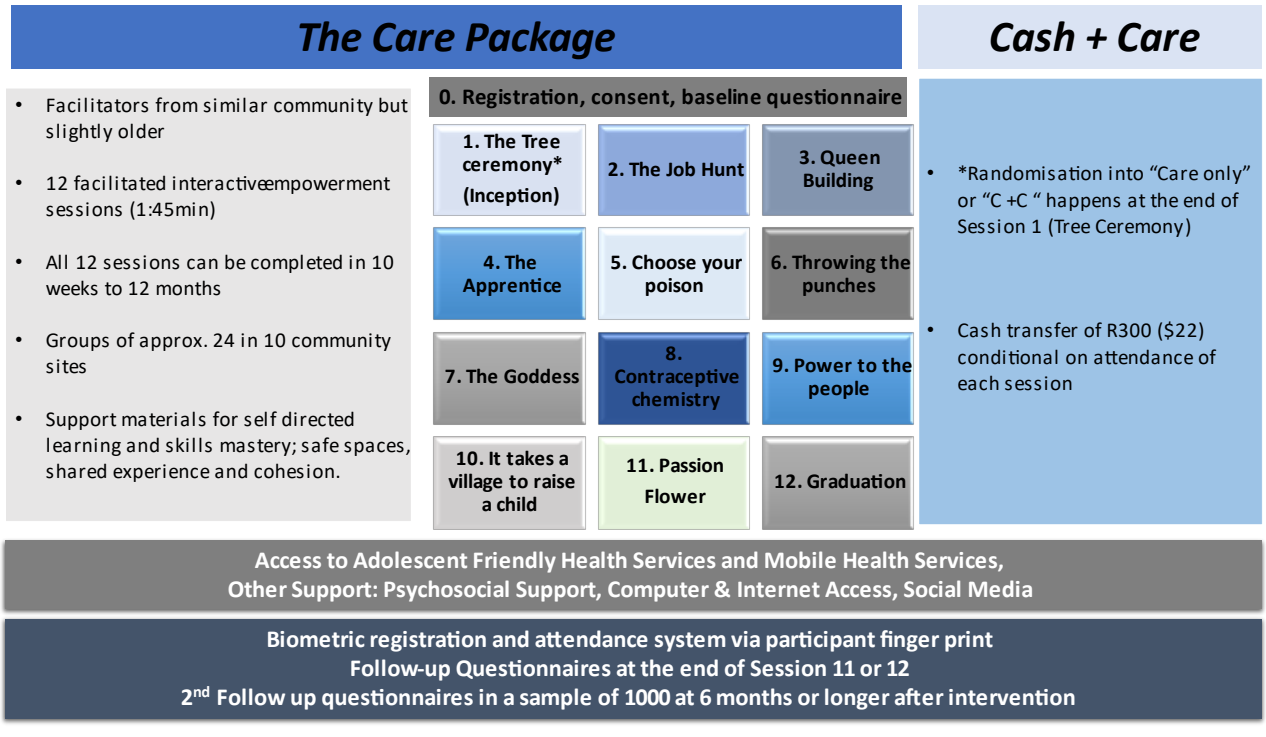
Randomisation: After biometric check-in and out of the first session (inception) the participants were randomised into one of the two study arms. A message was then

automatically sent to participants' mobile phones informing them of their assignment. At the end of each empowerment session, participants randomised to the conditional cash arm who attended a session were sent an Automatic Teller Machine (ATM) redeemable digital voucher via mobile phone. Those in the "care" only arm received a message of encouragement but no cash voucher.

A follow-up self-administered questionnaire was completed between the 11th and the 12th session on a digital tablet. The study aimed to undertake **passive follow-up of all participants** by monitoring ongoing clinic service attendance from health records for the duration of the study. This was to validate HIV/SRH results and assess the durability of the adoption of healthy SRH practices. Passive follow-up was however not possible due to challenges in demographic data linkages between research data and the health records in the Western Cape Government Data Centre. Therefore, to assess longer **term follow-up,** a sub-sample of 1000 participants who had attended at least one session at least 6 months to 30 months before the end of the study on 31 December 2019 were invited to attend and given R50 (approximately $3) after questionnaire completion. This sample size was based on budget availability as it had not been budgeted for originally as durability would have been assessed from health records. In this subset, the self-administered questionnaire was repeated for the third time.

The Women of Worth empowerment programme intervention schema is shown in Figure 11. Facilitators from similar

Figure 11: Women of Worth Intervention Schema



Data management: During the study, all individual study records and payment records were kept on a secure server managed by the IT company that ran the biometric registration and automatic CTs. The data was securely transferred to the final database upon completion of the trial.

Data Analysis: Baseline risk factors were compared by the study arm to assess whether randomisation ensured comparable HIV vulnerability by testing differences between groups using chi-square statistics with a $p \leq 0,05$ threshold for statistical significance. As a measure of retention, the Women of Worth empowerment programme completers were defined as those who completed at least 11 sessions.

Logistic regression models were fitted with subject-specific random mixed effects, to estimate the intra-individual change estimates of effect. We measured changes in self-reported HIV, behavioural and structural SRH risks from baseline to (a) end of the Women of Worth empowerment programme and (b) at follow-up (6-30 months post-exposure) irrespective of Women of Worth empowerment programme completion. Observations in the models included subjects at baseline and at these outer time points. Maximum-likelihood estimation of the model parameters ensured unbiased estimates despite LTFU under the missing-at-random assumption. However, to mitigate potential bias due to unmeasured confounders or predictors of LTFU in the "care" arm, the analysis of change in outcomes was not disaggregated by the study arm. Estimates from both study arms were pooled.

Models included the number of visits attended to measure intervention dose. Models were adjusted for confounding variables that were a) statistically different at baseline between the study arms and b) baseline variables that were associated with loss to follow-up (LTFU) at the end of the Women of Worth empowerment programme and at follow-up. All analyses were conducted using STATA 15 [365].

6.9.1.4 Specific Objective 4: To determine pathways of effect.

Outcomes: Conceptual framework of pathways by which the Women of Worth empowerment programme intervention may have caused effect.

This was a sub-study of the main Women of Worth empowerment programme study that used a cross-sectional mixed method study design that included a quantitative survey by self-administered questionnaire and in depth interviews (IDI) of participants who completed the Women of Worth empowerment programme between May 2019 and August 2019 and were graduating from the programme. This sub-study aimed to describe participants' experiences of the Women of Worth empowerment programme and the role of the conditional CT on the recipient's livelihoods.

Quantitative methods: Survey

Sample Size: 100 surveys (convenient sample size)

Study Phases: 1b and 2

Study participants and recruitment: The aim was to systematically sample 100 young women who had finished 11 sessions and were classified as Women of Worth empowerment programme completers. The data collection team attended graduation ceremonies at different sites and invited every second participant to participate.

Every second participant regardless of randomisation who attended the graduation session and was graduating from the Women of Worth empowerment programme trial were invited. Participants were informed that the study team was interested in their experiences of the Women of Worth empowerment programme trial and feedback about the CTs.

The study was introduced while participants were awaiting the graduation ceremony (session 12). Those who consented completed a self-administered questionnaire and could opt into IDIs indicating interview language preference.

Data Collection: Questionnaires assessed four main domains based on the study's theoretical underpinnings for autonomy, competence and relatedness using a combination of 1-10 Likert-scale (where 1 was least agreement and 10 most agreement) and multiple-choice questions (where participants had to choose the most correct option). The four domains were 1) overall programme satisfaction and impressions of individual empowerment skills-building session 2) motivations for attending the programme to completion; 3) autonomy and decision-making related to CT use; 4) impact of the contextual factors related to receiving cash. Questionnaires were piloted for ease of understanding and interpretation on Women of Worth empowerment programme facilitators from similar communities as Women of Worth empowerment programme participants, translated into isiXhosa and Afrikaans and reviewed and approved by the ethics committee.

Data Analysis: I compared the socio-demographic characteristics of the consenting sub-study participants with those of the Women of Worth empowerment programme main study group to assess whether the two groups are comparable by testing differences between groups using a z-test with a $p \leq 0,05$ threshold for statistical significance. I undertook logistic regression to examine the influence of age, household size, income source, highest level of education, food, savings and personal items spending decisions. I also calculated the proportions of survey responses. I used Stata 15 for all analyses.[365]

Qualitative Methods: In depth interviews (IDIs)

Study sample size: 20 IDIs (10 per study arm) out of the 100 who completed the questionnaires. The target sample size was 20% of those who completed the questionnaires (10 "C+C" and 10 "care") and who had consented to an interview. Checking for saturation was intended at 8 interviews (4 cash yes and 4 cash no) to determine the required sample size.

Recruitment and Data Collection: Participants consenting for IDIs were interviewed in a private space at the graduation venue while awaiting graduation. A structured questionnaire guide was used to conduct IDIs by two female trained researchers (TN[4] & AN) who were fluent in isiXhosa and English and were not previously known to participants. No participants chose to be interviewed in Afrikaans. We used the same interview guide (see Appendix H) and questions about their experiences of being part of the Women of Worth empowerment programme, their perceptions of barriers and motivations of participation and about positive and negative experiences in the programme. We asked those who received the cash about their experiences of receiving the cash and their autonomy in spending decisions. The interviewers were instructed to probe as was contextually relevant. The interviews were approximately 15 minutes duration to limit interference with the graduation sessions. TN and AN met once a week during the data collection period to discuss emerging themes and study logistics. It was felt that saturation was reached after 13 participants in total. We received permission to audio-record the IDIs and sent recordings to an external service provider for verbatim transcription. Each of the two researchers checked the transcriptions against the recordings of the interviews they conducted. The transcripts were not verified by participants as the study had ended.

Data analysis: We used a thematic analysis approach to systematically categorise our data by themes from the aims and objectives of the study (induction) and we generated emergent categories from the data (deduction). We used NVivo 12 for coding and thematic analysis.[367] After all the interviews were completed and transcribed, TN coded 3 transcripts and created a codebook that was checked and discussed with JH, our advisor. JH assisted with modification of codes and descriptions. TN completed coding of all transcripts. AN independently coded 5 transcripts using a codebook created by TN. A triangulation meeting was held between TN and AN to discuss and amend the codebook. TN reviewed all transcripts again to capture the modified codes. TN and AN then developed preliminary themes from the codes using both inductive and deductive reasoning and determined the relevant participant quotations to

[4] TN is Tracey Naledi aka Noncayana Tracey Dawn Naledi (the Ph.D. student writing this thesis)

illustrate the themes. Quotations in this paper were edited for readability and pseudonyms used to protect participants' confidentiality.

TN developed a conceptual framework for the pathways of effect of Women of Worth empowerment programme using a three-pronged strategy. TN firstly interpreted findings from this sub-study in relation to the main Women of Worth empowerment programme study outcomes. The theoretical frameworks utilised to conceptualise the Women of Worth empowerment programme study including SCT, SDT and behavioural economic theory and the literature on pathways of action for CCT's in AGYW was then applied. All of this was used to develop the proposed conceptual framework for the pathways of effect for Women of Worth empowerment programme. This is described and presented graphically in the findings chapter seven, Figure 13.

Table 14: Summary of the research methods for each of the specific objectives

Specific Objectives	**To determine implementation factors that promote scaling up of sustained engagement**	**To determine implementation fidelity**	**To determine the effectiveness of CCTs in reducing HIV infection and moderating biological, behavioural and socio-demographic risk factors in women receiving the Women of Worth empowerment programme intervention.**	**To determine the pathways of effect for the Women of Worth empowerment programme intervention effect including the cash transfers in reducing HIV vulnerability in young women 19-24 years in Cape Town, South Africa**
Study Phases	Phase 1a, 1b and 2	Phase 1a, 1b and 2	Phase 1a and 1b	Phase 1b and 2
Outcomes	Programme Uptake, retention and efficiency	Implementation score;	Primary outcome: self-reported changes in HIV prevalence Secondary outcomes: self-reported SRH/HIV related risk factors measured before and after exposure to BI sessions during the RCT study phase.	Pathways of effect

Study Design	Implementation Science tools (RE-AIM, Programme monitoring)	Serial cross sectional study design	Randomised Control trial	Descriptive cross-sectional design, Qualitative Research Methods
Data collection	Attendance records, programme records	Structured fidelity testing questionnaires	Self-administered questionnaire biological, behavioural and socio-demographic risk factors on digital tablet. Baseline, after session 11 and long term follow up	Self-administered survey & In-depth interviews (IDI's) transcripts of experiences of participating in WoW and insights on the role the CT on livelihoods.
Data Management	Secure server	Microsoft Excel, Stata	Stata	Stata, NVivo
Data analysis	logistic models to test impact of modifications on uptake, retention. Median weeks and IQR	Median scores were calculated for Likert scores, and numbers and proportions were used to describe binary data. Logistic regression	logistic regression models with subject-specific random for mixed effects,	Thematic Analysis

6.10 Ethics and ethical review

The study design was discussed with community stakeholders and the DTHF associated local Community Advisory Board (CAB) before protocol finalisation. Ethics approval for the main Women of Worth empowerment programme study protocol (specific objectives 1-3) was received from the University of Cape Town Human Research Ethics Committee (HREC): HREC 033/2017. The randomised control trial of this study was registered with BMC Trials ISRCTN25016009 https://doi.org/10.1186/ISRCTN25016009. Ethics approval (HREC 716/2018) and informed consent for the mixed methods sub-study for specific objective 4 was sought in addition to that already received for the main Women of Worth empowerment programme study. Women who participated in Women of Worth empowerment programme were encouraged to use the adolescent-friendly services set up as part of the broader concurrently run Zimele project funded by the GF. The Women of Worth empowerment programme groups were introduced to health clinic peer navigators to facilitate clinic contact and contact details of the closest YFHS were made available at the Women of Worth empowerment programme sites. Health service attendance aligning to the topic covered in

the Women of Worth empowerment programme session was actively promoted and facilitators could refer participants to mobile and fixed health facilities and the Zimele psychosocial support team. Any young women that did not participate in the Women of Worth empowerment programme or its sub-studies were able to obtain adolescent friendly SRH services at the local public sector clinics.

6.11 Next chapter

The next chapter will outline the findings for each of the four specific objectives of the Women of Worth programme evaluation which were to determine the implementation factors that promote scaling-up of sustained engagement. In addition, it determined implementation fidelity; effectiveness of the CT component of the Women of Worth empowerment programme intervention of SRH/HIV risk factors and determined pathways of effect for the programme.

CHAPTER 7: Research Findings

7.1 Introduction

This chapter reports the findings of the research by specific objective:

1. **Specific Objective 1**: To determine implementation factors that promote scaling up of sustained engagement of young women 19-24 years in the Women of Worth empowerment programme. Summarised as “To determine implementation factors that promote scaling up of sustained engagement.”
2. **Specific Objective 2**: To determine implementation fidelity of the Women of Worth empowerment programme intervention. Summarised as “To determine implementation fidelity.”
3. **Specific Objective 3**: To determine the effectiveness of CCTs in reducing HIV infection and moderating biological, behavioural and socio-demographic risk factors in women receiving the Women of Worth empowerment programme intervention. Summarised as “To determine effectiveness.”
4. **Specific Objective 4**: To determine the pathways of effect for the Women of Worth empowerment programme intervention effect including the CTs in reducing HIV vulnerability in young women 19 -24 years in Cape Town, South Africa. Summarised as “To determine pathways of effect.”

7.2 Findings for Specific Objective 1: To determine implementation factors that promote scaling up of sustained engagement.

7.2.1 Study Modifications according to RE-AIM Framework

The Women of Worth empowerment programme was paused after Phase 1a and optimized based on the RE-AIM Framework. This is an implementation science tool that was used to optimise programme **uptake, retention and efficiency**.

Using the RE-AIM framework, several modifications were made to the Women of Worth empowerment programme during the randomisation component after the initial pilot (Phase 1a) part of the programme shown in Table 15. The following modifications were made:

1. Modifications to improve **REACH** included decentralised recruitment to each of the 10 community venues that were in the two sub-districts where the research was done rather than at the main research site in Klipfontein sub-district. An incentivised recruitment strategy for Women of Worth empowerment programme graduates known as the Women of Worth Sisters programme where a graduate could refer up to a maximum of five (5) participants and receive a R100 (about $5) cash incentive.

2. **EFFECTIVENESS** indicators and theoretical concepts of the intervention remained unchanged.
3. **ADOPTION** by participants was promoted by changing the attendance schedule for the Women of Worth empowerment programme sessions from at least monthly to at least weekly. This meant participants could still take up to 12 months to complete the sessions but could graduate within 10 weeks if they chose to. Fixed timetables of when each of the 12 sessions would be delivered and the flexibility to attend sessions in any order at any one of the community venues was introduced. The fixed schedule was advertised on social media.
4. To promote **IMPLEMENTATION**, the study adapted from roving research teams responsible for multiple sites to a dedicated team of a facilitator and an administrator per site to manage the biometric system. The application of an electronic bar-coding system (QR codes) to track the Women of Worth Sister's programme and health services attendance. Additional prompts for facilitators to promote health and psychosocial services were introduced.
5. To support implementation and ensure **MAINTANANCE** of these changes in the research setting, direct observation of the Women of Worth empowerment programme sessions by two adjudicators using a structured fidelity assessment tool to monitor session quality was introduced. Facilitators were trained prior to the use of the fidelity instrument to ensure its use was seen as constructive and not punitive. The adjudicators de-briefed and agreed on consensus scores immediately after the assessment and then gave feedback to the site team to ensure continuous quality and skills improvement of the site team. Training and enhanced support was offered to the facilitators through ongoing facilitator training, technical updates, mentoring and on-site self-development coaching. The study held weekly team meetings and shared lessons and successes from each of the sites facilitating health site competition. In translational research, maintenance describes institutionalisation into policy which was not the objective of the study but rather to maintain fidelity of implementation.[364]

Table 15: Intervention optimisation using a RE-AIM implementation approach.

RE-AIM criteria	Women of Worth empowerment programme Pilot Phase	Women of Worth empowerment programme Post-Modification Phase
Reach	Central registration office	Decentralised recruitment to each of the community venues
	Referrals from community outreach teams working door to door, local NGO's, health facilities and local media.	Word-of-mouth; and an incentivised recruitment strategy (Women of Worth empowerment Sister's programme)
Effectiveness	Intervention effectiveness measures unchanged	Intervention effectiveness measures unchanged
	Programme uptake, retention, efficiency measures unchanged: Programme uptake (registration and programme initiation) Programme retention: completion of at least 11 Women of Worth empowerment programme sessions Efficiency: Median number of weeks to complete the programme by study phase	Optimisation measures unchanged: Programme uptake (registration and programme initiation) Programme retention: completion of at least 11 Women of Worth empowerment programme sessions Efficiency: Median number of weeks to complete the programme by study phase
Adoption	Attendance schedule for the empowerment sessions only monthly	Attendance schedule for the empowerment sessions at least weekly or monthly if so wishes
	Participants attend only at site of enrolment as part of a cohort. Session schedule determined by facilitator on site	Fixed venue session timetables and flexibility to attend sessions in any order and at any one of the community sites. The first two and/or the last two sessions could be attended in the same week
	Inter-session self-learning activities a requirement	Inter-session self-learning activities optional as participants perceived this as "homework".
Implementation	Roving research teams responsible for multiple sites	A dedicated team of a facilitator and an administrator per site. The administrators managed amongst others the biometric system, which meant that the facilitators could focus exclusively on session delivery and rapport building with the participants.

RE-AIM criteria	Women of Worth empowerment programme Pilot Phase	Women of Worth empowerment programme Post-Modification Phase
	Strict adherence to training manual	Facilitators allowed to tailor the sessions according to the issues that seemed to resonate with participants; however, we expected them to deliver minimum key messages per session and this was monitored by unannounced visits for fidelity testing
	Paper based register at health facilities	Electronic bar-coding system (QR Codes) to track linkage to care of Women of Worth empowerment programme participants to health services and incentive recruitment programme. Active promotion of health and psychosocial services and referral to health facility
	In kind donation of the use of community venues which was unreliable and had poor safety and security	Poor safety and security and lack of reliability in the community venues was solved by renting selected and improved venues with enhanced availability, reliability, and security.
Maintenance	Project Manager providing support	Implementation monitored through the unannounced fidelity testing visits.
	Once off training at the beginning of the programme	Training and enhanced support for facilitators (Dedicated trainer recruited, researchers). Ongoing training, technical updates, mentoring and on-site self-development coaching.
	Ad hoc training, on site mentoring with limited capacity	Central weekly site reviews of uptake and retention data presented in full Women of Worth empowerment programme operational meeting for healthy site competition

7.2.2 Programme uptake

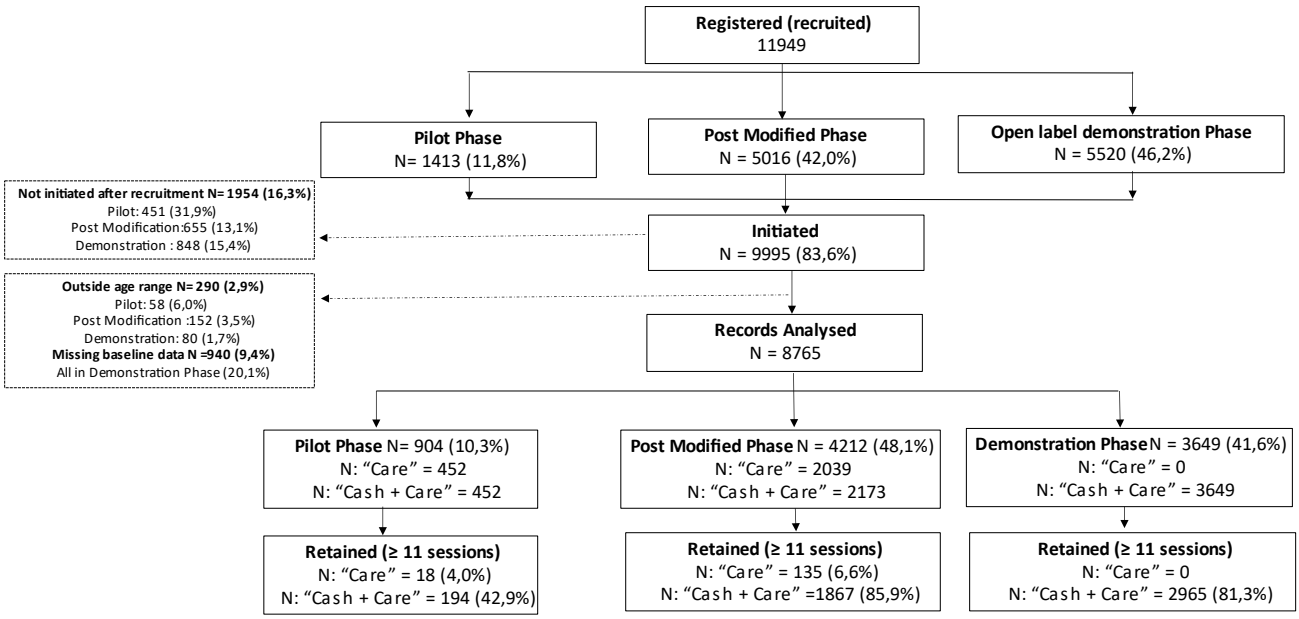
There were 11 949 participants recruited of which 1 954 (16,3%) chose not to initiate in the programme. Of those initiated (9 995), there were 8 765 participants who completed records

for analysis. From these records, there were 904 (10.3%) participants in the pilot phase 1a, 4 212 (48,1%) in the post-modification phase 1b and 3 649 (41,6%) in the demonstration, open label phase 2. Figure 12 shows the consort diagram for the Women of Worth empowerment programme.

Initiation was doubled when attendance was weekly and more flexible instead of monthly. Nearly a third (451) of the participants in the pilot phase 1a (31,9%) did not initiate the programme compared to 655 (13.1%) in the post-modification (phase 1b) and 848 (15,4%) in the demonstration phase 2.

After data cleaning we analysed 8 765 (87,7%) records of those who initiated the programme. In the final analysis, 904 participants were in the pilot phase 1a, 4 242 participants were in the Post modified phase 1b and 3 649 participants were in the demonstration phase 2.

Figure 12: Consort diagram of recruitment, enrolment and retention in the Women of Worth empowerment programme (All phases)

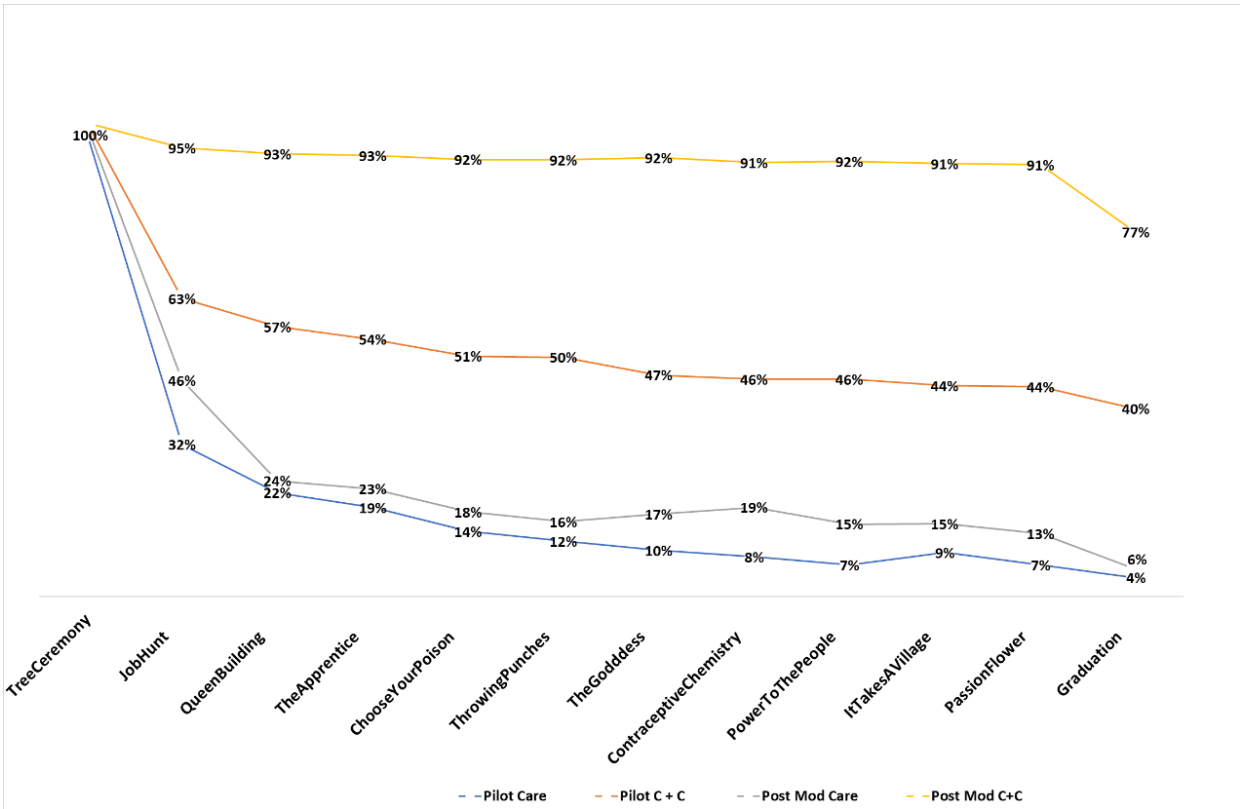


7.2.3 Programme retention by study arm and phases

Full programme retention ("completers") was defined as completing at least 11 of 12 Women of Worth empowerment programme sessions. The twelfth session was the graduation and closing off celebratory event. Figure 13 shows that nearly 60% of all participants [5 179 (59.1%)] completed the programme with significant differences in retention between study arms and phases. In the pilot phase 1a, only 212 (23.5%) participants were retained compared to 2 002 (47,5%) in post-modification phase 1b and 2 965 (81.3%) in the demonstration phase 2. The pilot and the post-modification phases included a randomly allocated arm which had

no CT (Care only) whereas all participants initiated in the demonstration open label phase 2 received a CCT (C+C).

Figure 13: Retention in the Women of Worth programme by study arm and study phase



Of the “C+C” participants enrolled in the post-modification phase, 1867 (85.9%) were Women of Worth empowerment programme completers and 1669 (76.8%) continued to graduation. Of those enrolled in the pilot phase, only 194 (42.9%) participants in the “C+C” arm were Women of Worth empowerment programme completers and 179 (39.6%) graduated. Overall, 1848 (78.5%) participants in the “C+C” arms in both the pilot 1a and post-modification 1b phases were retained.

In contrast as shown in Figure 13, participants randomised to “care” in all study phases, i.e., receiving no CTs, were poorly retained with a steep reduction in attendance at the end of the first session after randomisation was applied. Following modification, in the “care” arm, only 135 (6.6%) participants were Women of Worth empowerment programme completers and 117 (5.7%) graduated.

Uptake and retention: Logistic regression models showed that compared to Phase 1a (pilot), the odds of initiating the Women of Worth empowerment programme (uptake of the Women of Worth programme) were nearly 3-fold higher post-modification (Phase1b) (OR 2.96;95%CI:2.51;3.49) and 2.6 times higher (OR: 2.59 95%CI2.26;2.95) at scale-up in

demonstration phase. There was a 23-fold improvement in retention of participants (Women of Worth programme completers) in the post-modification phase (OR 22.91; 95%CI: 1.07; 516.39; p = 0.049) vs the pilot 1a phase.

Compared with “care” arm participants; “C+C” arm participants were 60 times more likely to be Women of Worth empowerment programme completers (OR 60.37; 95%CI: 17.32; 210.50.p <0.001).

Loss to follow up: There were 1 952 calls made to understand reasons for non-attendance, of these 804 (41,2%) participants required only one of the twelve sessions to complete the programme and 1 148 (58,8%) required between two to seven sessions of the twelve sessions. This process to reduce loss to follow up found that 1 397 (71,6%) of the registered participants could not be contacted after 3 call attempts with 811(70,6%) of those still requiring two to seven sessions and 586 (72,9%) of those requiring only one session to complete. Of these there were individuals who couldn’t be reached because they were at school or working [65 (5,7%)] and [41 (5,1%)] in each of the two to seven sessions and one session missing groups respectively. Only about 1 in 5 participants were successfully tracked down to return to the sessions: 258 (22,5%) and 427 (21,9%) in the two to seven sessions and one session missing groups, respectively. A very small proportion said they were no longer interested: 14 (1,2%) and 8 (1,0%) in the two to seven sessions and one session missing groups, respectively.

Efficiency: Participants who finished the programme in the shortest time in weeks had started the programme in the post-modification phase 1b (14 weeks; IQR 7) and the demonstration phase 2 (14 weeks; IQR 4) when the programme was weekly and more flexible compared to the monthly, less flexible pilot phase 1a (46 weeks; IQR 33.5). Table 16 shows the median and interquartile range (IQR) in weeks to complete the Women of Worth empowerment programme by study phase and randomisation. Receiving the CT in the post-modification and demonstration phases did not impact efficiencies as the median time to complete was similar. The IQR in the demonstration phase was, however, half of that in the post-modification phase. Suggesting that in the demonstration phase more participants finished the Women of Worth empowerment programme in the median time than in the post-modification phase.

Table 16: Median (IQR) weeks to Women of Worth empowerment programme Completion (≥ 11 sessions) by study phase and randomisation

	Care Only			**Cash-plus Care**			
	Pilot	Post Mod	**Total**	Pilot	Post Mod	Demo	**Total**
N	18	135	153	194	1868	2965	5027
Median	45	13	14	46	14	14	14
P25	28	10	10	32	11	12	12
p75	56	18	21	66	18	16	17
IQR	28	8	11	34	7	4	5

In summary, study modifications increased programme uptake (i.e., initiating the programme) 3-fold and scale up without study randomisation increased uptake 2.6-fold. Retention (i.e., completing the programme) was increased 23-fold because of study modifications indicating that the most efficient delivery model was weekly and flexible. These findings suggest that the RE-AIM framework supported the delivery of an improved programme and increased intervention exposure and increased likelihood for programme impact to be discernible. The CT addition to the intervention package, however, had the greatest impact with programme retention improving 60-fold compared with the ”care” arm without the CT.

7.3 Findings for Specific Objective 2: To determine implementation fidelity.

7.3.1 Assessing the implementation of modifications and other programme aspects.

The implementation of modifications made during the RE-AIM review of the pilot phase 1a of the project and other key programme elements were assessed through fidelity assessments at the Women of Worth empowerment programme sessions. There was a total of 77 fidelity assessments done with 24 facilitators. Each facilitator received a median of 2 (IQR 0;6) unannounced visits. Each of the 12 Women of Worth empowerment programme sessions was assessed a median of 6 (IQR 5;8) times. The venue appropriateness scores out of 5 shown in Table 17, ranged from 2.8 to 3.1, suggesting that the venues were reasonably adequate for safe group conversations.

Table 17: Venue Appropriateness

Scores	Median
Venue minimal distractions	3.0
Space comfortable for group engagement	3.1
Session facilitation resources availability	2.8
IT System Speed	2.8

Table 18 shows the extent of adoption/promotion of modifications and other key elements. Weekly session schedules and administrator support were available at sessions more than 80% of the time. The Women of Worth empowerment programme Sisters and QR Codes were minimally promoted at only 15 (19,7%) and 7 (9,2%) visits, respectively. Health facility or psychosocial service referrals only happened in half of the visits and less than half of those referrals [16 (47,3%)] were recorded to ensure follow-up. Other opportunities to promote preventative health and other support services which facilitators were expected to do at each session were missed in 57-70% of the time despite repeated encouragement to do so.

Table 18: Adoption of modifications

RE-AIM Domains		YES	%Yes	NO	No response	Total
Recruitment	Women of Worth Sisters programme (incentivised recruitment)	15	19,7%	0	62	77
Implementation: Operational	Transport on Time	61	80,2%	5	11	77
	Admin Support present	62	81,6%	5	10	77
Implementation: increase uptake of health services	Facilitator actively refers participant to health facility	38	50,0%	24	15	77
	Health Facility Promotion	33	43,4%	23	21	77
	Service Referral List Available	27	35,5%	48	2	77
	Peer Navigator Contact Details Available	23	30,3%	50	4	77
	Facilitator Records Participant Referral	16	21,1%	30	31	77
	QR Codes available	7	9,2%	56	14	77
Adoption	Weekly Schedules Displayed	62	81,6%	12	3	77

Table 19 shows the observed competence of the facilitators to deliver active listening and empathetic engagement taught in training. The median scores out of 5 ranged from 2,6 to 3,2

suggesting acceptable competence of facilitators. Assessment of delivery of the intervention was adequate with aims of the sessions and outcomes of the session articulated and take-home messages confirmed at the end of the sessions in a mean 3 of observed sessions (range 1-4).

Table 19: Observed competence of facilitators.

	Variable	**Observations**	**Mean**	**Std. Dev**	**Min**	**Max**
Facilitation practice assessment	Active Listening	70	3,2	0,5	2	4
	Questioning and Reflecting	69	3,1	0,6	1	4
	Suspending Judgement	68	3,0	0,6	1	4
	Effective Group Work	62	2,8	0,8	1	5
	Additive Empathy	38	2,8	0,8	1	4
	Interchangeable Empathy	30	2,6	1,1	1	4
Intervention Delivery	Orientation to Aims of Session	68	3,1	0,4	1	4
	Take Home Message Confirmation	64	3,1	0,6	1	4
	Outcomes Explicit	67	3,0	0,5	1	4

7.3.2 Summary of implementation fidelity findings

In summary the findings for implementation fidelity were that the delivery of the Women of Worth empowerment programme intervention was thought, overall, to be acceptable although this may have been less adequate when not observed.

Community venues and the space provided for attending the Women of Worth empowerment programme sessions were adequate for interactions with participants. When observed, the facilitators practiced active listening, empathetic and non-judgmentally engaged participants in an adequate number of observed sessions.

The adoption of the modifications after the pilot (phase 1a) was however, less consistent. Transportation to the venue was mostly on time, with admin support mostly present to assist with the biometric information system and weekly session schedules displayed in the venue. The incentivised recruitment strategy, the use of QR codes and appropriate promotion of health services and referrals related to the delivered Women of Worth empowerment programme sessions were however, poorly implemented despite regular trainings and prompts given to facilitators.

7.4 Findings for Specific Objective 3: To determine effectiveness.

There were 904 and 4 212 (in total 5 116) participants in the randomised pilot phase 1a and post-modification phase 1b, respectively. This analysis does not include the demonstration phase 2 since this component was open label without a comparator arm.

7.4.1 Baseline socioeconomic and structural vulnerabilities to HIV

Table 20 shows comparable baseline characteristics of participants by study arm. Definitions of the variables are found in Appendix E. Participants' median age was 21.5 years IQR [20.2; 22.9]. Only 2 391 (46.7%) completed high school and most 3 724 (72.8%) were unemployed but actively seeking work. Half 2 583 (50.5%) had no income with reported dependence on relatives and social grants and limited financial assistance from intimate partners. Despite high reported contraception usage, only 2 068 (40.4%) reported condom use at last sex and nearly half (2 361; 46.1%) the cohort reported a previous pregnancy and 1 135 (22.2%) individuals received treatment for an STI in the last six months. Although one third of individuals perceived themselves to be at high HIV risk almost all participants had undergone voluntary HIV testing in the last six months. Two-thirds of those who were HIV positive reported to be on ART but reported viral load suppression was less than 20%. Gender-based threats or violence by the current or last partner were experienced by 1 in 5 participants and 675 (13.2%) reported ever experiencing non-consensual sex. Overall health facility satisfaction reporting was relatively high in 3 152 (61.6%) of individuals. Most participants still reported dissatisfaction with long waiting times, travel distances, and unfriendly staff.

The cohorts from the pilot phase 1a and post-modification phase 1b were compared at baseline. The two cohorts were similar except the post-modification cohort had a lower socioeconomic profile and lower reported HIV prevalence (5.6 %) vs those in the pilot phase (8.2%).

Table 20: Baseline socio-economic and structural Indicators by study arm and study phase

	Pilot (N = 904)			Post- Modification (N= 4212)			All Phases randomised (N = 5116)			All Phases, All Arms (N = 5116)			
	Care Only N = 452	C+C N = 452	*p value*	Care Only N = 2039	C +C N = 2173	*p value*	Care Only N = 2491	C+ C N = 2625	*p value*	Pilot N = 904	Post-Modification N = 4212	Total N = 5116	p value
Mean Age [I95CI]	21.0 (18.6 ; 24.7)	21.0 (18,7 ; 24.7)		21.0 (18.6; 24.9)	21.0 (18.5; 24.9)		21.0 (18.6; 24.9)	21.0 (18.5; 24.9)		21.0 (18.6 ; 24.7)	21.0 (18.6 ; 24.7)	21 (18.5 ; 24.7)	
Gender: Female	444 98.2%	437 96.7%	*0.139*	2037 99.9%	2166 99.7%	*0.116*	2481 99.6%	2603 99.2%	***0.048***	881 97.5%	4203 99.8%	5084 99.4%	***<0.001***
Language: isiXhosa	343 75.9%	342 75.7%	*0.938*	1726 84.7%	1875 86.3%	*0.132*	2069 83.1%	2217 84.5%	*0.175*	685 75.8%	3601 85.5%	4286 83.8%	***<0.001***
Socio-economic determinants indicators													
Completed High School	215 47.6%	195 43.1%	*0.181*	949 46.5%	1032 47.5%	*0.537*	1164 46.7%	1227 46.7%	*0.992*	410 45.4%	1981 47.0%	2391 46.7%	0.359
Unemployed but Actively Seeking	346 76.6%	344 76.1%	*0.876*	1482 72.7%	1552 71.4%	*0.362*	1828 73.4%	1896 72.8%	*0.353*	690 76.3%	3034 72.0%	3724 72.8%	***0.008***
No income	186 41.2%	168 37.2%	*0.220*	1115 54.7%	1114 51.3%	***0.026***	1301 52.2%	1282 48.8%	***0.015***	354 39.2%	2229 52.5%	2583 50.5%	***<0.001***
Financial assistance from Social Grant	93 20.6%	124 27.4%	***0.016***	425 20.8%	490 22.6%	*0.180*	518 20.8%	614 23.4%	***0.025***	217 24.0%	915 21.7%	1132 22.1%	*0.134*
Financial assistance from intimate Partner	17 3.8%	21 4.7%	*0.507*	88 4.3%	93 4.3%	*0.954*	105 4.2%	114 4.3%	*0.822*	38 4.2%	219 4.3%	257 5.0%	*0.900*
Relationship status: Cohabiting/married	53 11.7%	45 10.0%	*0.392*	117 5.7%	142 6.5%	*0.282*	170 6.8%	187 7.1%	*0.675*	98 10.8%	259 6.2%	357 7.0%	***<0.001***
Psycho-social well-being determinants indicator													
Happy/Content/Optimistic	337 74.6%	332 73.5%	*0.705*	1228 60.2%	1238 57.0%	***0.032***	1565 62.8%	1570 59.8%	***0.027***	669 74.0%	2466 58.5%	3135 61.3%	***<0.001***
Family very supportive	321 71.0%	317 70.1%	*0.770*	968 47.5%	1015 46.7%	*0.619*	1289 51.8%	1332 50.8%	*0.473*	638 70.6%	1983 47.1%	2621 51.2%	***<0.001***
Alcohol drink 5 or more days per week	38 8.4%	36 8.0%	*0.808*	158 7.8%	182 8.4%	*0.456*	196 7.9%	218 8.3%	*0.567*	74 8.2%	340 8.1%	414 8.1%	0.909
Using drugs in last 3 months	22 4.9%	20 4.4%	*0.752*	103 5.1%	125 5.8%	*0.315*	125 5.0%	145 5.3%	*0.419*	42 4.7%	228 5.4%	270 5.3%	0.349
Sexual Reproductive Health (SRH) behavioural Indicators													
Ever tested for HIV	404 89.4%	421 93.1%	***0.045***	1879 92.2%	2023 93.1%	*0.241*	2283 91.7%	2444 93.1%	***0.050***	825 91.3%	3902 92.6%	4727 92.4%	0.156

	Pilot (N = 904)			Post- Modification (N= 4212)			All Phases randomised (N = 5116)			All Phases, All Arms (N = 5116)			
	Care Only N = 452	C+C N = 452	*p value*	Care Only N = 2039	C +C N = 2173	*p value*	Care Only N = 2491	C+ C N = 2625	*p value*	Pilot N = 904	Post-Modification N = 4212	Total N = 5116	p value
HIV test last 6months (378 missing records)	302/405 74.6%	331/422 78.4%	*0.189*	1549/1884 82.2%	1661/2027 81.9%	*0.823*	1851/2289 80.9%	1992/3843 81.3%	*0.677*	633/827 76.5%	3210/3911 82.1%	3843 81.1%	***<0.001***
Condom use at Last Sex	164 36.3%	162 35.8%	*0.890*	845 41.4%	897 41.3%	*0.915*	1009 50.5%	1059 40.3%	*0.905*	326 36.1%	1742 41.4%	2068 40.4%	***0.003***
STI Rx in last 6months	90 19.9%	98 21.7%	*0.512*	478 23.4%	469 21.6%	*0.148*	568 22.8%	567 21.6%	*0.301*	188 20.8%	947 22.5%	1135 22.2%	0.268
High HIV Risk Perception	141 31.2%	169 37.4%	***0.050***	724 35.5%	721 34.3%	*0.112*	865 34.7%	890 33.9%	*0.537*	310 34.3%	1445 34.3%	1755 34.3%	0.993
Ever used contraception	313 69.3%	316 69.9%	*0.828*	1447 71.0%	1563 71.9%	*0.490*	1760 70.7%	1879 71.6%	*0.465*	629 69.6%	3010 71.5%	3639 71.1%	0.257
On contraception currently:	281 62.2%	290 64.2%	*0.535*	1313 64.4%	1449 66.7%	*0.118*	1594 64.0%	1739 66.3%	*0.09*	571 63.2%	2762 65.2%	3333 65.1%	0.168
Ever Pregnant	216 47.8%	217 48.0%	*0.947*	927 45.5%	1001 46.1%	*0.695*	1143 45.9%	1218 46.4%	*0.712*	433 47.9%	1928 45.2%	2361 46.1%	0.245
HIV Outcome indicators													
HIV Positive	37 8.2%	37 8.2%	*1.000*	102 5.0%	114 5.3%	*0.720*	139 5.6%	151 5.8%	*0.790*	74 8.2%	216 5.3%	290 5.7%	***<0.001***
HIV Positive on ART	21/37 56.8%	22/37 59.5%	*0.814*	69/102 67.7%	75/114 65.8%	*0.772*	90/139 64.8%	97/151 64.5%	*0.928*	43/74 58.1%	144/216 66.7%	187 64.5%	0.184
HIV Positive VL Suppressed	7/37 18.9%	4/37 10.8%	*0.327*	21/102 20.6%	20/114 17.5%	*0.569*	28/139 20.1%	24/151 15.9%	*0.346*	11/74 14.9%	41/216 19.0%	52 17.9%	0.426
Structural determinants Indicators													
GBV threat	65 14.4%	71 15.7%	*0.577*	426 20.9%	476 21.9%	*0.423*	491 19.7%	547 20.8%	*0.316*	136 15.0%	902 21.4%	1038 20.3%	***<0.001***
Forced Sex ever	36 8.0%	46 10.2%	*0.247*	278 13.6%	315 14.5%	*0.422*	314 12.6%	361 13.8%	*0.226*	82 9.1%	593 14.1%	675 13.2%	***<0.001***
Transactional sex ever	29 6.4%	19 4.2%	*0.138*	359 17.6%	353 16.2%	*0.239*	388 15.6%	372 14.2%	*0.158*	48 5.3%	712 16.9%	760 14.9%	***<0.002***
Overall health facility satisfaction	299 66.2%	303 67.0%	*0.778*	1246 61.1%	1304 60.0%	*0.466*	1645 62.0%	1607 61.2%	*0.554*	602 66.6%	2550 60.5%	3152 61.6%	***0.001***
Dissatisfaction: Waiting time	276 61.1%	261 57.7%	*0.770*	1129 55.4%	1147 52.8%	*0.305*	1405 56.4%	1408 53.6%	*0.185*	537 59.4%	2276 54.0%	2813 55.0%	***<0.001***

	Pilot (N = 904)			Post- Modification (N= 4212)			All Phases randomised (N = 5116)			All Phases, All Arms (N = 5116)			
	Care Only N = 452	C+C N = 452	*p value*	Care Only N = 2039	C +C N = 2173	*p value*	Care Only N = 2491	C+ C N = 2625	*p value*	Pilot N = 904	Post-Modification N = 4212	Total N = 5116	p value
Dissatisfaction: Unfriendly staff	53 11.7%	57 12.6%		339 16.6%	390 18.0%		392 15.7%	447 17.0%		110 12.2%	729 17.3%	839 16.4%	
Dissatisfaction: Travel	83 18.4%	88 19.5%		349 17.1%	374 17.2%		432 17.3%	462 17.6%		171 18.9%	723 17.2%	894 17.5%	

Baseline variables associated with retention (Tables 21 and 22) and those that had a statistically significant association with retention at the end of the Women of Worth empowerment programme (completers vs non-completers) and at median 15 months (followed up vs not followed up) were used to adjust the models discussed below. A Women of Worth empowerment programme “completer” was an individual who attended at least 11 sessions.

Table 21: Baseline characteristics that are different in Women of Worth empowerment programme completers compared to non-completers.

At baseline N = 5116	Women of Worth empowerment programme completers N = 2214	%	Number of non-completers N = 2902	%	P value
Study Phase (post modification)	2002	90.4	2210	76.2	<0.001
Female (others non-binary)	2198	99.3	2886	99.5	0.441
Language: isiXhosa	1893	85.5	2393	82.5	0.003
Completed High School	1059	52.2	1332	45.9	0.170
No Income	1120	50.6	1463	50.4	0.902
Cohabit or Married	154	7.0	203	7.0	0.956
Happiness	1312	59.3	1823	62.8	0.010
Family Supportive	1092	49.3	1529	52.7	0.017
Binge Drinking[5]	186	8.4	228	7.9	0.479
Drugs in Last 3 months	119	5.4	151	5.2	0.786
Current Contraception	1475	66.6	1858	64.0	0.053
HIV test in last 6 months	1698/2071	82.0	2145/2667	80.4	0.173
Condom use at last sex	920	41.6	1148	39.6	0.150
High HIV risk perception	734	33.2	1021	35.2	0.130
Treated STI in last 6 months	486	22.0	649	22.4	0.725
HIV positive	123	5.6	167	5.8	0.760
GBV threat	469	21.2	569	16.6	0.165
Forced sex	314	14.2	361	12.4	0.068
Transactional sex	335	15.1	425	14.7	0.628
Employed	17	0.77	33	1.14	0.405
Facility Satisfaction	1363	61.6	1789	61.6	0.951

5 Proportion of participants self-reporting to drink 5 or more drinks in a typical day of drinking

Table 22: Baseline characteristics that are different in those at follow-up compared to those not at follow-up.

At baseline N = 5116	Follow up (15 months) N = 337	%	Non-follow up N = 4779	%	P value
Study Phase (post modification)	259/330	78.5	3953/4786	82.6	0.058
Female (others non-binary)	326/330	98.8	4758/4786	99.4	0.162
Language: isiXhosa	316/330	95.8	3970/4786	83.0	<0.001
Completed High School	195/330	59.1	2196/4786	45.9	<0.001
No Income	179/330	54.2	2404/4786	50.2	0.159
Cohabit or Married	20/330	6.1	337/4786	7.0	0.499
Happiness	215/330	65.2	2920	61.0	0.135
Family Supportive	186/330	56.4	2435/4786	50.9	0.054
Binge Drinking[6]	24/330	7.3	390/4786	8.2	0.572
Drugs in Last 3 months	6/330	1.82	264/4786	5.52	0.004
Current Contraception	226/330	68.5	3107/4786	64.9	0.188
HIV test in last 6 months	273/316	86.4	3570/4422	80.7	0.013
Condom use at last sex	143/330	43.3	1925/4786	40.2	0.265
High HIV risk perception	98/330	29.7	1657/4786	34.6	0.068
Treated STI in last 6 months	74/330	22.4	1061/4786	22.2	0.914
HIV positive	18/330	5.5	272/4786	5.7	0.862
GBV threat	67/330	20.3	971/4786	20.3	0.995
Forced sex	37/330	11.2	638/4786	13.3	0.271
Transactional sex	36/330	10.9	724/4786	15.1	0.037
Employed	11/330	3.33	148/4786	3.09	0.807
Facility Satisfaction	206/330	62.42	2946/4786	61.6	0.753

7.4.2 Sexual and reproductive health outcomes by arm

Of the 2 214 Women of Worth empowerment programme completers, 1 149 (51.9%) completed questionnaires after 11 sessions: 1 005 in “C+C” and 144 “care” arms. Adjusted

[6] The proportion of participants self-reporting to drink 5 or more drinks in a typical day after the Women of Worth empowerment programme completion with both study arms combined are shown in Table 22.

changes in self-reported SRH behavioural and structural risk factors at end-line immediately after Women of Worth empowerment programme completion with both study arms combined are shown in Table 23. Models included the number of visits attended to measure intervention dose. Models were adjusted for confounding variables that were a) statistically different at baseline between the study arms and b) baseline variables that were associated with loss to follow-up (LTFU) at the end of the Women of Worth empowerment programme and at follow-up.

Table 23: Impact of the Women of Worth empowerment programme intervention on intra-subject self-reported behavioural and structural risk variables in women who completed the Women of Worth empowerment programme and those followed up at median 15 months.

Immediately after Women of Worth empowerment programme[#$] **(compared to self at baseline)**	**OR**	**95% CI**		**P value**
HIV test in last 6 months	0.25	0.20	0.31	<0.001
Condom use at last sex	0.49	0.40	0.60	<0.001
High HIV risk perception	0.05	0.03	0.08	<0.001
Current contraception	1.62	1.29	2.03	<0.001
Treated STI in last 6 months	1.50	1.21	1.85	<0.001
GBV threat	0.53	0.41	0.69	<0.001
Forced sex	0.37	0.27	0.52	<0.001
Transactional sex	0.50	0.37	0.66	<0.001
Employed	3.34	2.22	5.04	<0.001
Facility Satisfaction	1.45	1.20	1.75	<0.001
#**Adjusted** for session attendance, study phase, Language: isiXhosa, Happiness, Family Support. $**Observations** include responses at baseline and endline of the Women of Worth empowerment programme				
At Follow up (median 15 months after CT stopped)[@*] **(compared to self at baseline)**	**OR**	**95% CI**		**P value**
HIV test in last 6 months	0.70	0.12	4.15	0.696
Condom use at last sex	0.91	0.98	1.02	0.593
High HIV risk perception	0.89	0.71	1.13	0.350
Current contraception	1.00	0.77	1.29	0.973
Treated STI in last 6 months	1.09	0.99	1.34	0.432
GBV threat	0.99	0.76	1.30	0.964
Forced sex	0.75	0.50	1.11	0.152
Transactional sex	0.83	0.63	1.10	0.200
Employed	2.47	1.69	3.59	< 0.001
Facility satisfaction	0.90	0.72	1.12	0.373
[@]**Adjusted** for session attendance, study phase, Language: isiXhosa, High School completion, Family Support, HV testing in last 6 months, Transactional sex ***Observations** include responses at baseline and at extended line (median 15 months)				

As shown in Table 23, compared to baseline, changes in self-reported structural risk factors at the end of the Women of Worth empowerment programme were consistent. The odds of self-reporting current employment status increased more than 3-fold (p <0.001) and self-reporting facility satisfaction increased 45% (p <0.001). The odds of self-reporting GBV threat, forced sex and transactional sex were reduced by 47% (p <0.001); 63% (p <0. 001) and 50% (p <0.001) respectively.

However, the changes in SRH behavioural risk factors were mixed. The odds of self-reporting uptake of contraception and STI treatment increased by 62% (p < 0.001) and 50% (p< 0.001) respectively at the end of the Women of Worth empowerment programme compared to baseline. On the other hand, comparing the same period, the odds of self-reporting HIV testing in the last 6 months, condom use at last sex and perception of HIV risk were reduced by 75% (p <0.001), 51% (p< 0.001 and 95% (p < 0.001), respectively. At baseline, 290 participants self-reported HIV positivity, 42 participants identified as positive at the end of the Women of Worth empowerment programme randomisation phase (1a and 1b) and 7 participants at end of the extended follow up at 15-months self-reported HIV positivity for the first time. These self-reported incident infection numbers were insufficient to model; hence this has not been included in Table 23.

7.4.3 Durability of the impact of the Women of Worth empowerment programme

There were 330 participants (132 “care” and 198 “C+C”) of the 1000 participants invited to assess for durability of effect and the dose response of the empowerment skills-building sessions who were in the randomised phases (1a and b) of the study. The rest of the participants who accepted the invitation for follow up were in the demonstration phase 2 and were not used in this analysis.

In the 330 participants, follow-up time was median 15.0 months [IQR:13.3;17.8] post-intervention. In this group, 206 (62.4%) attended ≥9 sessions and 102 (30.9%) ≤ 3sessions. As shown in Table 22, at this time point, the odds of self-reported current employment status were the only variable that showed statistically significant durability and was increased 2.5-fold (p <0.001) compared to baseline. Even though the other variables were not statistically significant, they were nonetheless in the same direction to the effect immediately post the Women of Worth empowerment programme. There was no discernible dose response.

Unfortunately, the plan to link the Women of Worth empowerment programme study records with health records from the Western Cape Department of Health Data Centre for passive follow up for one year to validate biological indicators and evaluate the dose response in non-completers of the programme was unsuccessful as health facility identifiers were not

systematically collected in the study. National identity numbers on the other hand were poorly reflected in the provincial Data Centre database thus limiting linkage possibilities.

7.5 Findings for Specific Objective 4: To determine pathways of effect.

At graduation, we surveyed 112 young women. We found 107 (95,5%) were in the "C+C" arm. Since most of those who graduated were in the C+C groups, we interviewed 10 young women receiving cash-plus care and 3 young women who did not receive cash and were in the care only group. Quotations from participants referred to below were edited for readability and pseudonyms were used to protect participants' confidentiality.

7.5.1 Contextual factors

The qualitative findings for the surveys and the interviews are described below. At baseline, within the context of the research, namely low socio-demographics; deprivation strained family structures and dynamics, but participants retained a strong sense of family responsibility and obligations. In the baseline context of low high school completion, participants also presented with information and knowledge deprivation related to reducing HIV vulnerability.

Low socio-demographics

The socio-demographic characteristics of the 112 women in the qualitative sub-study were comparable to those in the overall Women of Worth empowerment programme cohort. The median age of 22.2 years was comparable to the Women of Worth empowerment programme randomised cohort at 21.5 years [IQR20.2;22.9]. The survey group had higher levels of poverty with 65 (58,0%) participants reporting no income compared to 4 052 (46,2%) in the main Women of Worth empowerment programme study group. Nonetheless, the two groups were similar in that most participants (90/112) were isiXhosa speaking, lived in households of more than 4 people (79/112), had not completed high school (57/112) and were unemployed but seeking employment (79/112).

Deprivation strains family structures and dynamics

Some manifestations of deprivation in our participants included extended family structures and a financial reliance on family and national social grants.[339] Thembi shared her circumstance in joining the programme and how the money has assisted her.

> *"Before I joined my life was bad, I never had – I lived with my brother, I'm unemployed and he is the one that's working, so I'm dependent on him since I wasn't having any luck finding something (referring to finding work)… It (referring to the cash transfer) was helping me with toiletries so that I didn't have to ask my brother all the time that.. Food would run out because he buys it, so when something small like rice would run out, I would use it to buy." Thembi [Participant 005: Lines 27-29 & 38-40]*

Family conflict in study participants was associated with deprivation, and a diminished sense of value and belonging in participants. Andrea below shares the family conflict's impact on how she feels valued in her family.

> *"So sometimes it's hard because he (referring to her father) has that anger, and then he takes that anger out on us, you see…, 'I have that thing that my mother doesn't care about me, and only cares about my stepfather who only provides financially… My sister ended up going to live with my grandmother" Andrea. [Participant 010: Lines 42-49]*

Families often had other health and socio-economic concerns and participants sometimes migrated for better opportunities. The pressure and responsibility highlighted by several participants is expressed by Ongeziwe below.

> *"My parents live in the rural areas… my father is the only person that's working. So, at home we are many and my eldest sister has ill health, so she sometimes must pay for a specialist. So, I can't be asking my mother for money all the time while she is back in the rural areas." Ongeziwe [Participant 011: Lines 179-182]*

Strong sense of family responsibility and obligations

Participants reported an overwhelming sense of family responsibility and obligations that often influenced choices made for their development.

> *"I didn't sit for my Grade 12 exam (referring to the final high school exam), but then I went on to attend Cape College (referring to a vocational college) in 2013. But then I fell pregnant in 2013, so I thought, okay, I am pregnant so I must take responsibility and go and work and not depend on my boyfriend. So, after that, I had a desire to go back to school but then I thought about what would happen to my child; because my aunt is dependent on a grant." Yolanda [Participant 003: Lines 32-36]*

Many of our participants had been unsuccessfully seeking work for some time and told us of the gruelling and draining process of trying to find employment. Ongeziwe hints at becoming discouraged and despondent.

> *"Yes, I wish that they (referring to potential employers) would just call me, the problem is that it's (referring to looking for work) exhausting because I've been searching for so long, so I'm tired" Ongeziwe. [Participant 011: Lines 65-66]*

Financial support while studying was seen as a necessary requirement as family responsibilities always remained.

> *"So, I'm thinking if I do go and study, I have to get something (referring to a need for study stipend) as well so that I can help as well" Hazel. [Participant 008: Lines 212-213]*

Information and knowledge deprivation

Many of them navigate these transitions into adult livelihoods with poor information of more than just SRH and HIV but life skills in general that would ensure sexual autonomy and agency for health and stable livelihoods.

> *"I didn't know about a lot of things that have to do with girls. It has changed because like I said, in the beginning I didn't know, and when I got here, I was taught – I mean I didn't know much I was just doing; but then when I got here, they informed me about what to do, so it has changed very much." Andiswa. [Participant 002: Lines 131-133]*

7.5.2 Perceptions and experiences of cash

The perceptions of participants of the cash were that it promoted dignity and self-esteem. Even though participants displayed autonomy in spending decisions, these decisions were influenced by deprivation and a sense of family responsibility. There was minimal experience of violence related to cash.

"It is not always about the money".

In the self-administered questionnaire, participants could choose more than one reason for completing the Women of Worth empowerment programme. Only 20/186 (10,8%) identified cash as the reason for completing the programme. The programme being fun and interesting was most cited [107/186 (57,5%)] followed by liking the facilitator 32/186 (17,2%) as a reason for remaining in the programme. The majority of those randomised to "C+C", 103/107 (96,3%) said they would continue the Women of Worth empowerment programme even without a CT.

Some participants, although very few, continued to attend the programme even without receiving the cash. Ursula on reflecting on her reasons said:

> *"I kept coming even when I wasn't receiving it (referring to the cash transfer), I didn't have that thing that told me to stop, I just thought to myself I'm learning and as long as I graduate. I was excited about the fact that there was going to be a graduation and it would be fun. So, I thought to myself as long as I'm going to graduate then it's fine." Ursula [Participant 012: Lines 105-109]*

However, cash as an incentive to attend is borne out by the high retention rate of “C+C” compared to “care” group. In IDIs participants explained that the cash was an incentive to come to the programme and a strong motivator to continue attendance.

> *“There are some people who are in bad situations, and they really need this money, I mean like yes, not just money but information as well and some assistance. Yes, and not be greedy because some people don’t want that money, they just need assistance sometimes – information….so, what I loved about it (referring to Women of Worth empowerment programme) is that I really learnt a lot, I don’t want to lie, and I really would have loved for it to continue without benefitting any money, I would still go.” Yolanda. [Participant 003: Lines 178-184 & 73-75]*

In IDIs, participants reported navigating transitions into adult livelihoods with limited information and competence for SRH and life skills. Capacity development and empowerment were understood as more valuable than money.

> *“The most important thing is the information, money is not important, money will pass but your knowledge, no one can take that away from you. You will finish the money, but no one can take your knowledge.” Ongeziwe. [Participant 011: Lines 242-245]*

Cash promoted dignity and self-esteem.

Gratitude was expressed for receiving the cash as participants were often in dire need. The cash helped in gaining self-respect and a sense of achievement in receiving a reward for positive actions taken.

> *“I have money that will come through my bank account saying that it is mine and I’ve worked for it...it’s something big for me, and as you keep coming here you get to learn a lot… And being the woman that you are you are a beautiful woman and being the woman you are, don’t hide what’s inside of you, show yourself. So, me being the person I am, I am a colourful person who can smile at some point because of this programme, and because of the money from the Women of Worth empowerment programme because it helped me a lot.” Andrea. [Participant 010: Lines 223-232]*

Receiving money via SMS on their mobile phones further afforded participants privacy, pride and dignity while supporting their agency and autonomy to spend their money as they wished.

"The positive thing is that this thing was private, …I was the only person who knew how I was receiving this money, besides me disclosing... So, I didn't have to go and queue somewhere, so it was easy for me to receive it. And my phone is private, no one opens it and says, "Here it's coming in, let me take this money before she does". Yolanda. [Participant 003: Lines 136-147]

Autonomy in spending decisions influenced by deprivation.

Most participants [85/107 (79,4%)] who completed the self-administered questionnaires reported autonomy in spending decisions with 100/107 (93,5%) withdrawing money from the ATM themselves. 16 participants reported that their mothers made spending decisions and in 5 participants' mothers withdrew their money from the ATM. Most participants (64/139) reported spending their cash on food. Personal items (toiletries, clothes, shoes) (21/139) were the second most common use of the cash with spend on seeking employment (12/139) and savings (12/139) tying for third place. In the IDIs participants confirmed their autonomy in spending decisions with all those interviewed reporting to make their own financial decisions and using the money mostly for necessities.

"I was using my money for rent and using it on food, but I was mostly using it for rent, so I can't say that I bought trousers or did my hair with the money, I used it on important things." Alude. [Participant 007: Lines 25-27]

When the likelihood of saving cash or using cash on personal items controlling for variables such as lack of income; number of people in the household, age and matric completion was modelled; we found that those who lived in larger households were less likely to save and spend money on personal items than those who lived in households with fewer people, [households of 4-6 were less likely to save (OR = 0.23; 95%CI 0.051;1.01, p=0.051) and 82% less likely to use their cash on personal items. For every year of increasing age from 19 years there was a 22% reduction in the likelihood of spending money on personal items [OR 0.78 95%CI 0.59; 1.04 p=0.088]. Having no income was not shown to be a significant influence on spending decisions.

In interviews, many participants reported to manage their money well, making it stretch to fulfil needs for themselves and their families and in some instances even saving for short periods.

"So, I know that when the money comes in, R100 goes to my sister who is going Grade 12, so Saturday's and Sunday's she must be at school so I know it will help her with transport. And then with the other R100, … I know that I can get 5kg maize meal and 5kg rice from that R100. And then I know that with the other R100 I will buy data, searching for a job and I make calls,

and everything. And there would be some change left, and it lasts." Andrea. [Participant 010; Lines 104-110]

Minimal experiences of violence related to cash:

Most participants, (97/107; 90,7%) did not report verbal or physical violence related to the CT nor have their CT taken away from them by force (103/107; 96,3%). In the seven (7) participants who experienced verbal or physical violence; three (3) cited the mother as the perpetrator, three (3) cited another family member and one (1) did not respond to the question to identify the source of the violence. In the four (4) participants that reported the cash taken by force; two (2) participants cited the mother and two (2) cited another family member. None of the 16 participants who reported that their mother made spending decisions and the five (5) who reported that their mother withdrew their money experienced violence nor had their money taken by force. There was no citing of intimate partners as perpetrators or violence. None of those who were interviewed experienced any violence from any person, known or unknown, related to the CT.

7.5.3 Perceptions and experiences of the women of worth empowerment programme

The Women of Worth empowerment programme experienced the programme as a safe, respectful, and reflective space of sisterhood that was empowering. They gained new knowledge and self-confidence that ignited their autonomy and agency for making health-promoting life decisions for safe SRH behaviours and job seeking. Participants also reported gaining competence in family and intimate partner power relationships and experiencing a sense of community.

A safe, respectful, and reflective space of sisterhood that is empowering.

In the survey, 94/112 (83,9%) participants scored their overall satisfaction of the Women of Worth empowerment programme as 10/10 with 100/112 (89,3%) saying they would recommend the programme to a friend. This sample was however, of those who completed the programme and excludes non completers, so it is likely to be biased in this regard. Most participants 108/112 (96,4%) made new friends in the Women of Worth empowerment programme and 100/112(89,3%) plan to stay in touch with those friends. The data from IDIs confirm that they made new respectful friendships and they felt respected by research staff, and this translated into regaining feelings and attitudes of self-respect. Peer interaction allowed reflection, gaining of insights and new perspectives of their lives.

"Okay, what I liked most about this programme is firstly the respect and the way we behaved when we were there to attend, and even, what can I say… okay when I got there, I came by myself but then I came here and made

friends, I still communicate with them... when we were at the session it was a safe space for us to be able to share our personal stuff, and not thinking that they are going to make fun about it. We were able to share things as sisters." Sisonke [Participant 013; Lines 125-131]

Facilitators were experienced by participants as respectful and supportive and credited for creating an environment where participants could have voice to share challenges and views without judgement.

"Being heard because I spoke a lot in the sessions and I had a lot to say, because always when I'm in a group, or whenever I'm in a group I don't speak a lot, so it helped me to open up more when I'm in a group." Nancy [Participant 004; Lines 28-30]

Some participants said that the sisterhood of the Women of Worth empowerment programme often extended into the facilitators who supported and encouraged them.

"It had changed me a lot because I was the kind of girl that never wanted to exercise and so on, but Women of Worth helped all our girls in the community to look at the future, helped us, and some of them (referring to facilitators) encourage us a lot on what to do, and don't do that. After the sessions they would talk to us, but it helped me a lot because we were always like, 'Why must we exercise,' and 'Have (safe) sex and so on,' Women of Worth changed our entire living." Emmanuella [Participant 006: Lines 104-109]

The groups often provided solace from the family chaos, anger, and aggression they felt at home.

"So, …sometimes you come here stressed out thinking about your problems, and then you come here it's like home, you chat and then you forget about your issues at home, so you forget." Andrea [Participant 010: Lines 203-205]

The safe space created provided an emotional container for the participants when they were emotionally triggered by their own experiences and/or for the emotional reactions of their compassion and empathy felt for other participants.

"Sometimes you become emotional when we are sitting and talking about whatever, like you just become emotional, you would find yourself crying. I don't usually cry in front to people, but I would become very emotional by

taking that person's pain and adding it to mine, so I would become emotional, and things like that." Yolanda [Participant 003: Lines 159-163]

Participants were able to gain perspective and insights into their own lives and coped better with lived experiences.

"So, I had problems with my family, so once I started coming here, we were taught that yes you live with your family, and yes families are different, in some you are ill-treated and in some you are treated well. So, I learnt that in a family you won't all be loved equally, and because I was raised by my grandmother – it wasn't a nice upbringing. But then when I started attending here, I started to realise that no man the things they (referring to other participants) were talking about are the same things that are happening to me. So, when I started coming here, I saw a change, there was peace with my family, yes, I don't live with them, but I do go to them". Ursula [Participant 012: Lines 8-17]

New knowledge and self-confidence improve autonomy and agency.

In the survey, participants could make more than one choice of the Women of Worth empowerment programme session they liked or disliked. The Women of Worth empowerment programme sessions liked had 217 responses and the programme session disliked had 110 responses by participants. Most participants enjoyed the Women of Worth programme sessions and 46,4% (51/110) participants did not dislike any sessions. The top five most liked sessions were "It takes a Village" (a session about pregnancy, childbirth and community support), "Choose your poison" (a session about improving self-perception of risk & decision-making) and "Contraception Chemistry" (an info-session about contraception, medications and access to healthcare), "Queen Building" (a session about healthy lifestyles, emotional well-being & beauty perceptions) and "Job Hunt" (a session about setting & achieving career goals).

In the IDIs, participants spoke of how they were able to apply the new knowledge gained and the life lessons in decision-making in their personal lives.

"It (referring to Women of Worth empowerment programme) was a very nice and hopeful experience because I've learnt a lot and the advice that I've taken in, I've practiced it at home. So, for me I feel empowered by the programme itself.…I deal with them (referring to situations) differently because of the advice I took in from the sessions". Nancy [Participant 004: Lines 84-85]

The knowledge and self-confidence gained permeated into self-efficacy and improved increased competence in SRH behaviours, accessing health services and improved agency for SRH behaviours.

> *"I liked that I respect myself, and protect myself when it comes to unprotected sex, I know about HIV and STIs, so I know that I should protect myself; because they say there are STIs that are incurable, you must take treatment for them. So, I learnt that I should respect and protect myself... Yes, I condomize now all the time because you can't physically see that a person has an STI or is (HIV) positive". Ongeziwe [Participant 011: Lines 30-33 & 106-107]*

Speaking freely about sex and sexuality with parents and intimate partners was sometimes associated with shame. The self-confidence gained in the Women of Worth empowerment programme gave participants the conviction to initiate such topics with family members and intimate partners.

> *"Sometimes we are ashamed to speak about such things (referring to sex) at home, so there (referring to Women of Worth empowerment programme) we were enacting things that have to do with sex and so on, ... Before I came here, I couldn't speak to her (referring to her mother), we speak now…we were then able to speak freely... about anything like sex and things like that." Andiswa [Participant 002: Lines 84-86; 149-151 & 168]*

Participants gained insights, confidence, and competence for successfully navigating processes of seeking work and other developmental opportunities.

> *"What I learnt here from Women of Worth empowerment programme is "Job Hunt" (Referring to a Women of Worth empowerment programme Session), where they taught us how to dress when you go for an interview, well firstly, you should have confidence when you go for an interview and you must do research about will happen in the job that you are going to, and what is going to happen, I should go there pumped with information so that I can pass it." Alude [Participant 007: Lines 63-67]*

Thembi recalls the impact of the skills learnt of seeking a job and planning for one's future.

> *" they told us what to do in an interview… There was a programme from SETA (referring to the Sector Education and Training Authority" where they help you*

find a job. They told us to bring our CVs and WoW helped me by helping me create a CV" Thembi [Participant 005: Lines 60-63]

Gaining competence in family and intimate partner power relationships:

Participants' reported perceptions of increased maturity, self-confidence and self-pride that translated into feelings of self-esteem, agency and voice with intimate partners and family members.

> *"My experience when I came here I didn't, feel so good about myself… People always used to walk over me and do what they want to do with me, but now I am a changed woman and I stand up for myself… (It is like) a flower when it's summer, the flower begins to open and then you see all the beautiful things that are kept inside… I was a flower that was closed, that didn't open, I didn't open up to anybody, but when I started to attend the programme and the sessions and that, I started to appreciate myself, I started looking after myself." Elaine [Participant 009: Lines 10-12 & 28-32]*

Emmanuella shared her experiences of gaining voice and competence in partner power relationships:

> *"Yes, it (referring to Women of Worth empowerment programme) changed me as well because I used to say, "You can tell me what you want," and when I was here and started with the programme I started to stand up and tell him what's right and what's wrong. And I've learnt, because he was like on drugs when I started with this programme, I started to tell him, "Don't do it," he started to come off it and now he's working." Emmanuella [Participant 006: Lines 129-133]*

Strengthening relationships and a sense of community

The ability of participants to support themselves and other family members sometimes had the benefit of improving family relationships. Andrea shares below that even when these relationships were not improved, the life-skills learnt in the Women of Worth empowerment programme allowed for better coping.

> *"The problem I had is that you (referring to her stepfather) take your anger out on us, and we didn't do anything wrong," you understand. But then at some point I apologised because I like to pray so I realized that, if I forgive him then all of that will be lifted off me. So, I tried but nothing changed on his part, he was still doing those things that he was doing, but to me I was*

> *free because I had asked for forgiveness and was able to speak to him, even my mother knows that. But then my mother, since I got a job, she was able to get up and start something with a friend of hers. She receives a grant for her three children, so they were able to put some money together, to pay rent there and buy things to cook and sell to people who fix cars there [referring to mechanics]." Andrea [Participant 010: Lines 148-156]*

Some participants reflected on a stronger sense of community and belonging where they felt they were part of a social network that they could count on for supporting their transitions to adulthood.

> *"I liked that you don't raise a child on your own, you receive support from neighbours and from family. When I say you receive support from neighbours, I mean that when you are not there, there are people who look after the child to see if they are safe." Ongeziwe [Participant 011, Lines 46-49]*

Yolanda below revealed gaining agency to strengthen support structures to further build on the social networks and capital in her community.

> *"Power to the People," (referring to one of the sessions) teaches you that if you have a problem in your community, don't make fun about it… you can start support groups and help each other, and things like that." Yolanda [Participant 003: Lines 54-57]*

In summary, this sub-study on the qualitative experiences of participants shows that contextual factors of socioeconomic deprivation juxtaposed with a strong sense of family responsibility influenced livelihood decisions. Participants with big families and older participants were more likely to support their families and less likely to buy personal items or save. The cash used for food and basic needs for participants and their family's promoted dignity. This was necessary to overcome the competing demands of transitioning into adulthood and promoted uptake and sustained engagement in the Women of Worth empowerment programme. Participants reported intrinsic motivation for autonomy, competence and relatedness. Safe, respectful, and reflective space and a sense of sisterhood were found to be empowering. New knowledge and self-confidence with improve autonomy and agency for SRH behaviours and job seeking was reported. Participants gained competence in family and intimate partner relationships and experienced strengthened relationships and a sense of community.

7.5.4 Conceptual framework of pathways of effect

This conceptual framework for the pathways of effect for the Women of Worth empowerment programme was developed to show how the Women of Worth programme worked in the real world based on the evidenced based design of the Women of Worth empowerment programme and the conceptual framework for the evaluation of the programme discussed in Chapter four and in Figure 8 and 9.

This evidence base incorporated theories and models discussed in Chapter two that included SCT that posits that behaviour change is regulated by the interdependence of personal, behavioural and structural factors; the SDT asserting that all humans are naturally inclined to autonomy, learning, mastery (or achievement motivation) and connection with others and will thus be intrinsically motivated to act to meet these objectives and the behavioural economics theory positing that CTs promote behaviour change by leveraging extrinsic motivation.[7,137,140,141] The evidence base also included effective interventions to reduce HIV vulnerability in AGYW and the evidence on combination implementation of complex interventions in the real world discussed in Chapter three.

Chapter four in Figure 9, shows the inputs, outputs, intermediate and final outcomes that were expected based on the theory of change of the Women of Worth empowerment programme that defined the programme logic and working model for testing the research conceptual framework for the effectiveness pathway for the Women of Worth empowerment programme shown in Figure 8.The conceptual framework for the pathways of effect for the Women of Worth empowerment programme was developed by summarising key findings of the evaluation against the theory of change developed in Chapter four.

Table 24 shows the findings of the Women of Worth empowerment programme evaluation in relation to the inputs, outputs, intermediate and final outcomes anticipated in the theory of change described in Chapter four.

Context: Table 24 shows that at baseline, programme participants experienced high levels of multiple deprivation with low high school completion and low socio-demographic profile. The deprivation experienced by participants strained family structures and dynamics. However, there was a reliance on financial support from families and social grants. Participants experienced a very strong sense of family responsibility and obligations that framed their life decision-making processes. At the same time programme participants presented at baseline with information and knowledge deprivation related to reducing HIV vulnerability. Participants reported navigating transitions into adult livelihoods with limited information and competence for SRH and life skills.

Inputs of the Women of Worth empowerment programme. The findings of the evaluation of the Women of Worth empowerment programme showed that overall, 60% of all participants [5 179 (59.1%)] completed the programme (attended at least 11 sessions). Participants who received the CT when compared with "care" arm participants; were 60 times more likely to complete eleven or more Women of Worth empowerment programme sessions (OR 60.37; 95%CI: 17.32; 210.50.p <0.001). In the IDIs the participants explained that the cash was an incentive to come to the programme and a strong motivator to continue attendance. Participants had minimal experiences of violence related to receiving the CT. The cash received by young women invariably improved not only their short-term financial independence but impacted positively on relationships with family members.

The 12 Women of Worth Empowerment sessions: The top five most liked sessions were "It takes a Village" (a session about pregnancy, childbirth and community support), "Choose your poison" (a session about improving self-perception of risk & decision-making) and "Contraception Chemistry" (an info-session about contraception, medications and access to healthcare), "Queen Building" (a session about healthy lifestyles, emotional well-being & beauty perceptions) and "Job Hunt"(a session about setting & achieving career goals).

Respectful and empathetic engagement: The community venues and the space provided for attending the Women of Worth empowerment programme sessions were found to be adequate for interactions with participants. When observed, the facilitators of the Women of Worth empowerment programme practiced active listening, empathetic and non-judgmentally engaged participants in an adequate number of observed sessions.

YFHS were made available to participants and the findings of the evaluation showed that compared to baseline, participants self-reported facility satisfaction showed an increase of 45% (p <0.001) immediately at the end of the programme compared to baseline. This finding, however, did not show durability in the long term.

Adaptive research methods were used to support the outputs of efficient recruitment, retention and programme delivery. When evaluated the Women of Worth empowerment programme intervention was implemented with acceptable fidelity. The RE-AIM framework supported the delivery of an improved programme and increased intervention exposure and increased likelihood for programme impact to be discernible. The odds of initiating the Women of Worth empowerment programme were nearly 3-fold higher post-modification (Phase1b) (OR 2.96;95%CI:2.51;3.49) and 2.6 times higher (OR: 2.59 95%CI2.26;2.95) at scale-up in demonstration phase. The findings of the evaluation were that there was a 23-fold improvement in retention of participants (Women of Worth empowerment programme

completers) in the post-modification phase (OR 22.91; 95%CI: 1.07; 516.39; p = 0.049) vs the pilot 1a phase.

Outputs of the Women of Worth empowerment programme: The findings of the evaluation showed that the most efficient delivery model was weekly and flexible. Retention into the programme differed by study phase implemented in relation to adaptative research methods and as discussed above was heavily influenced by the CT. In the pilot phase 1a there were 212 (23.5%) participants retained to 11 sessions or more compared to 2 002 (47,5%) in the post-modification phase 1b and 2 965 (81.3%) in the demonstration phase 2.

Intermediate Outcomes: In the theory of change described in Chapter four, there were changes expected in knowledge, skills, competencies, and capabilities; mastery, self-reflection and self-responsibility; motivation, agency and autonomy for SRH and safe spaces of sisterhood.

In relation to knowledge, skills, competencies, and capabilities; the findings of the evaluation were that the knowledge and self-confidence gained in the programme permeated into self-efficacy and improved increased competence in SRH behaviours, accessing health services and improved agency for SRH behaviours. Participants gained insights, confidence, and competence for successfully navigating processes of seeking work and other developmental opportunities. Furthermore, participants gained competence in family and intimate partner power relationships. The ability of participants to support themselves and other family members sometimes had the benefit of improving family relationships.

In relation to mastery, self-reflection and self-responsibility; in the IDIs participants reported that cash promoted dignity and self-esteem. Participants reported perceptions of increased maturity, self-confidence and self-pride that translated into feelings of improved self-esteem, agency and voice with intimate partners and family members. Participants gained mastery in family and intimate partner relationships and experienced strengthening relationships. Participants spoke of how they were able to apply the new knowledge gained and the life lessons in decision-making in their personal lives. Peer interaction allowed reflection, gaining of insights and new perspectives of their lives.

In relation to motivation, agency and autonomy for SRH; the findings of the evaluation were that new knowledge and self-confidence improve autonomy and agency for safe SRH behaviours and attaining livelihoods. Participants showed autonomy in spending decisions, but this was influenced by multiple deprivation and family dynamics. Most participants spent their CT on food and participants who lived in larger households were less likely to save and spend money on personal items than those who lived in households with fewer people [households of 4-6 were less likely to save (OR = 0.23; 95%CI 0.051;1.01, p=0.051) and 82%

less likely to use their cash on personal items. For every year of increasing age from 19 years there was a 22% reduction in the likelihood of spending money on personal items [OR 0.78 95%CI 0.59; 1.04 p=0.088].

Capacity development and empowerment were understood by participants as more valuable than money. The money was however, shown to be an extrinsic motivator to attend the programme. As discussed above, the CT increased programme attendance 60-fold compared to those who did not receive the CT.

Sense of Community. The Women of Worth empowerment programme was experienced by participants to be a safe, respectful, and reflective space of sisterhood that was empowering. Furthermore, participants experienced a sense of community in their programme cohorts. Participants were able to gain a sense of active citizenry by showing motivation to increase social networks and capital in their community.

Study Outcomes: The Primary Outcome of the evaluation was reduced HIV. The findings however, showed no measurable impact of the Women of Worth programme on reported HIV status. The incident HIV infection numbers were too low to model in the analysis. Secondary Outcomes of increased safe SRH behaviours and increased employment were expected. The findings of the evaluation showed changes in SRH behaviours only in the short term immediately after the Women of Worth empowerment programme. These changes may have however waned over time and were not found to be statistically significant in the long term. Self-reported uptake of contraception and STI treatment increased by 62% ($p < 0.001$) and 50% ($p< 0.001$) respectively. The odds of self-reported GBV threat, forced sex and transactional sex were reduced by 47% ($p <0.001$); 63% ($p <0. 001$) and 50% ($p <0.001$) respectively. Self-reported HIV testing in the last 6 months, condom use at last sex and perception of HIV risk were reduced by 75% ($p <0.001$), 51% ($p< 0.001$ and 95% ($p < 0.001$), respectively.

Self-reported current employment status increased more than 3-fold ($p <0.001$) immediately after the programme. Employment status was sustained to a 2.5-fold increase in the C+C arm ($p <0.001$) at median 15 months [IQR:13,3;17,8]).

Figure 14 shows a conceptual framework developed from the findings of the Women of Worth empowerment programme evaluation showing the pathways of effect of the CT received by the programme participants.

This conceptual framework depicts a profile of young women who are urban, unemployed, out-of-school and characterised by multiple deprivation, fractured family relationships, poor information and competence for SRH and livelihoods with low self-confidence and self-esteem. In addition, these young women were financially reliant on families and social grants

and displayed a strong sense of family responsibility that framed their life decisions. The participants displayed intrinsic motivation for their capacity development and valued this more than the cash.

The possibility of receiving the CT nudged the interest of participants to register for the Women of Worth empowerment programme. The CT was used for food and basic needs for participants and their families but was necessary to create demand for the Women of Worth empowerment programme and to act as an extrinsic motivator to sustain engagement in the programme. Those young women from big families and those who were older were more likely to prioritise support to their families and less likely to buy personal items or save. The cash received by young women invariably improved not only their short-term financial independence but impacted positively on relationships with family members.

The sustained engagement in the Women of Worth empowerment programme led to increased knowledge in SRH and life skills. The engagement with peers facilitated empathetically increased opportunities of reflection and gaining new perspectives and insights. Empathetic engagement also improved a sense of dignity, self-esteem, self c-confidence and enhanced motivation to access health services and safer SRH behaviours. These changes in perceptions of self and of being valued by others were associated with participants' ability to meet family and social expectations.

Increased self-determination in young women increased their hope, autonomy, agency, and competence for seeking employment, reducing SRH risk. There was improved management of partner power dynamics while supported by their connectedness to peers and health resources in their community. In the short term this resulted in increased facility satisfaction, uptake of contraception and STI services, reduced GBV reports, forced and transactional sex and in the longer term to increased and sustained employment.

Table 24: Findings from the Women of Worth Empowerment programme Evaluation summarised in relation to Theory of Change

	Theory of Change elements	**Findings from the Women of Worth Empowerment programme Evaluation**
	Context	Multiple deprivation, low high school completion, low socio-demographics profile Deprivation strains family structures and dynamics Reliance on extended families & grants Strong sense of family responsibility and obligations Information and knowledge deprivation related to reducing HIV vulnerability. Participants reported navigating transitions into adult livelihoods with limited information and competence for SRH and life skills.
Inputs	Cash transfer	Compared with "care" arm participants; "C+C" arm participants were 60 times more likely to be Women of Worth empowerment programme completers (OR 60.37; 95%CI: 17.32; 210.50.p <0.001). In IDIs participants explained that the cash was an incentive to come to the programme and a strong motivator to continue attendance. Minimal experiences of violence related to cash:
	12 Empowerment Sessions	60% of all participants [5 179 (59.1%)] completed the programme (attended at least 11 sessions) Most participants enjoyed the Women of Worth empowerment sessions. The top five most liked sessions were: "It takes a Village" (a session about pregnancy, childbirth and community support), "Choose your poison" (a session about improving self-perception of risk & decision-making) "Contraception Chemistry" (an info-session about contraception, medications and access to healthcare),

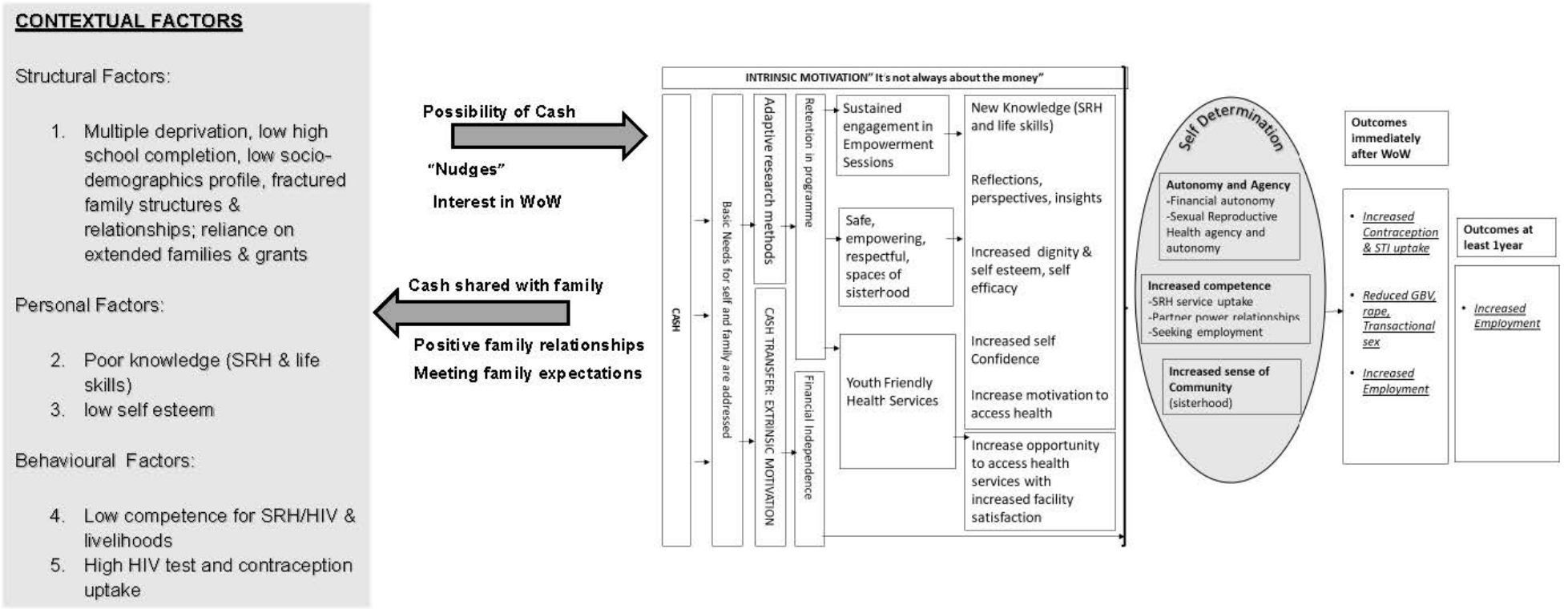
		"Queen Building" (a session about healthy lifestyles, emotional well-being & beauty perceptions) "Job Hunt" (a session about setting & achieving career goals).
	Respectful and empathetic engagement	Community venues and the space provided for attending Women of Worth empowerment programme sessions were adequate for interactions with participants. When observed, the facilitators practiced active listening, empathetic and non-judgmentally engaged participants in an adequate number of observed sessions.
	Youth-friendly health services	Self-reported facility satisfaction increased 45% ($p < 0.001$) immediately at the end of the programme compared to baseline
	Adaptive research methods	Women of Worth empowerment programme intervention implemented with acceptable fidelity. RE-AIM framework supported the delivery of an improved programme and increased intervention exposure and increased likelihood for programme impact to be discernible. The odds of initiating the Women of Worth empowerment program were nearly 3-fold higher post-modification (Phase1b) (OR 2.96;95%CI:2.51;3.49) and 2.6 times higher (OR: 2.59 95%CI2.26;2.95) at scale-up in demonstration phase. There was a 23-fold improvement in retention of participants (Women of Worth empowerment program completers) in the post-modification phase (OR 22.91; 95%CI: 1.07; 516.39; $p = 0.049$) vs the pilot 1a phase.
Outputs	Efficient programme delivery	The most efficient delivery model was weekly and flexible.

	Sustained Engagement: Recruitment & Retention	Women in the "C+C" group were 60 times (OR 60.37; 95%CI: 17.32; 210.50.p <0.001) more likely to be "completers" (women who completed ≥ 11 sessions) vs the "care" group. Participants retained to 11 sessions or more: Pilot phase 1a :212 (23.5%) Post-modification phase 1b: 2 002 (47,5%) Demonstration phase 2: 2 965 (81.3%)
Intermediate Outcomes	Knowledge, skills, competencies, and capabilities (Health literacy healthy relationships, career planning and job seeking, and active citizenry)	The knowledge and self-confidence gained permeated into self-efficacy and improved increased competence in SRH behaviours, accessing health services and improved agency for SRH behaviours. The self-confidence gained in the Women of Worth empowerment programme gave participants the conviction to initiate topics on sex and sexuality with family members and intimate partners. Participants gained insights, confidence, and competence for successfully navigating processes of seeking work and other developmental opportunities. Participants gained competence in family and intimate partner power relationships: The ability of participants to support themselves and other family members sometimes had the benefit of improving family relationships. Gaining agency to strengthen community support structures to further build on the social networks and capital in community.
	Mastery, self-reflection and self-responsibility	Cash promoted dignity and self-esteem. Participants' reported perceptions of increased maturity, self-confidence and self-pride that translated into feelings of self-esteem, agency and voice with intimate partners and family members.

		Participants gained mastery in family and intimate partner relationships and experienced strengthening relationships. Participants spoke of how they were able to apply the new knowledge gained and the life lessons in decision-making in their personal lives. Peer interaction allowed reflection, gaining of insights and new perspectives of their lives.
	Motivation, agency and autonomy for SRH	Autonomy in spending decisions influenced by deprivation. Participants who lived in larger households were less likely to save and spend money on personal items than those who lived in households with fewer people [households of 4-6 were less likely to save (OR = 0.23; 95%CI 0.051;1.01, p=0.051) and 82% less likely to use their cash on personal items. For every year of increasing age from 19 years there was a 22% reduction in the likelihood of spending money on personal items [OR 0.78 95%CI 0.59; 1.04 p=0.088] New knowledge and self-confidence improve motivation, autonomy and agency for SRH. Capacity development and empowerment were understood as more valuable than money. The money was, however, an extrinsic motivator.
	Sense of community	The Women of Worth empowerment programme experienced by participants to be a safe, respectful, and reflective space of sisterhood that is empowering. Participants experienced a sense of community in their programme cohorts' social networks and capital in community
Study Outcomes	Primary Outcome: Reduced HIV	There was no measurable impact on reported HIV status. Incident infection numbers were insufficient to model.

	Secondary Outcomes: Increased safe SRH behaviours.	Changes only in the short term immediately after the Women of Worth Programme. These changes were not found to be durable: Self-reported uptake of contraception and STI treatment increased by 62% ($p < 0.001$) and 50% ($p< 0.001$) The odds of self-reported GBV threat, forced sex and transactional sex were reduced by 47% ($p <0.001$); 63% ($p <0. 001$) and 50% ($p <0.001$) respectively. Self-reported HIV testing in the last 6 months, condom use at last sex and perception of HIV risk were reduced by 75% ($p <0.001$), 51% ($p< 0.001$ and 95% ($p < 0.001$), respectively.
	Increased employment	Self-reported current employment status increased more than 3-fold ($p <0.001$) immediately after the programme. Employment status was sustained to a 2.5-fold increase in the C+C arm ($p <0.001$) at median 15 months [IQR:13,3;17,8]).

Figure 14: The conceptual framework for pathways of effect for the Women of Worth empowerment programme



7.6 Chapter Summary

In this chapter, I described the results of each of the four specific objectives of the evaluation of the Women of Worth empowerment programme. I showed that the context of deprivation of participants influenced programme participation and decision-making of participants and relationships with family.

Adaptative research methods were essential for ensuring sustained programme exposure to provide the best possibility for the programme to have effect. I also showed that overall, the programme was implemented with acceptable fidelity. I showed that sustained engagement was improved with weekly and flexible programming and that the CT was a critical requirement for demand creation, sustained engagement in the programme and ensuring financial independence. Sustained engagement in the programme in safe and empowering spaces with increased opportunities for access to health services resulted in increased autonomy, agency, mastery, self -responsibility and a sense of community. This showed short term safe sexual reproductive behaviours but did not show any discernible changes in HIV. The most impactful finding was the sustained and durable increase in the employment status of participants.

In the next chapter, these findings are discussed in relation to the existing evidence and literature to interpret and explain these them, to determine their significance and implications for HIV vulnerability in the study target population.

CHAPTER 8: Discussion

8.1 Introduction

In the previous chapter, the research findings of testing the conceptual framework of how the Women of worth empowerment programme actually worked in the real world using the theory of change described in Chapter four was reported.

In this chapter, the reader is first reminded of the rationale for this research and the knowledge contribution that this evaluation is adding to the problem of interest. The findings from the evaluation of the Women of Worth empowerment programme are interpreted and explained in relation to current literature and the finding's significance and implications for policy and programming and further research discussed.

8.2 The rationale for the research

The world is far off the targets set by the United Nations (UN) of ending AIDS by 2030. AGYW aged 15-24 years, in the Eastern and Southern African region and in South Africa in particular remain disproportionately affected by HIV compared to their male counterparts.[54–56] Young women, 19-24 years old are in their final stages of transitioning to adulthood and thus present the very last opportunity to establish health-promoting behaviours that would result in reduced HIV vulnerability and stable transition into adulthood and healthy future generations.[3]

The disproportionate burden of HIV vulnerability in AGYW is driven by structural and social determinants of health that include high poverty rates, low high school completion rates, low SRH/HIV knowledge, high unemployment rates and gender inequalities.[3,59,67,98,103,109,110]

Gender and economic inequality with patriarchal gender norms promote sexual coercion of young women, multiple sexual partners, intergenerational sex and GBV; are compounded by the global downward trend onset of menarche and sexual debut that increase HIV vulnerability.[35,37,50]

The complexity of the drivers for HIV in young women and the evidence of the effectiveness of biomedical and behavioural interventions call for multi-determinant approaches that include biomedical, behavioural and structural interventions that have a greater impact than single biomedical intervention approaches.[18,216,232–236]

CTs are an example of a structural intervention where poor households are given a financial contribution to reduce poverty and inequality. The scoping review of the effectiveness of CT interventions and their pathways of effect to reduce HIV vulnerability in AGYW in ESA revealed limited evidence for CTs reducing HIV infections but promising evidence for cash-plus interventions that include an additional human capability development component.[12] The

scoping review also found limited evidence and understanding of pathways of effect for CT interventions that was also confounded by contextual factors.

8.3 Women of Worth empowerment programme

The Women of Worth empowerment programme was a community-based combination SRH/HIV prevention programme combining a CT of ZAR300 (USD22) on completion of each of 12 SRH/HIV empowerment skills-building sessions (BI) and where YFHS were promoted and made accessible in two sub-districts in Cape Town, Western Cape, South Africa for young women aged 19-24 years.

The Women of Worth empowerment programme was funded by the GF and was nested in a larger AGYW national government HIV prevention programme that was comprehensive, layered, multi-sectoral consisting of SRH/HIV age appropriate interventions for early, mid and late adolescents (young women) and early interventions for adolescent boys (10-14 years).[238] The Women of Worth empowerment programme was one of two CT programmes for young women 19-24 years to address social determinants developed in the national AGYW HIV programme to test feasibility, effectiveness and gain lessons to inform future national programming.

Because the Women of Worth empowerment programme was a complex, layered intervention, the evaluation approach used adaptive implementation and research methods to address contextual factors for sustained exposure to the intervention to ensure validity and potential for generalisability of findings to inform policy and practice in South Africa and similar settings.

8.4 Research conceptual framework

The conceptual framework of how the Women of Worth empowerment programme would work in theory was designed based on theoretical frameworks of SCT, SDT and behavioural economics that define the determinants of behaviour and the BCW and TDF models that define the interventions to respond to these determinants described in Chapter three and four.

The aim was to assess the implementation and evaluate the effectiveness of CT component of the Women of Worth empowerment programme om the primary outcome of HIV prevalence and secondary outcomes of SRH risk factors.

The conceptual framework tested was that:

1. Local contextual factors will likely require adaptive research methods to ensure efficient recruitment, retention and programme delivery.

2. The CT given conditional on the attendance of 12 evidence-based facilitator-led Women of Worth empowerment programme sessions would provide financial incentives and reduce barriers for sustained participation and ensure an output of recruitment and retention in the programme.

3. Once sustained engagement is attained, the Women of Worth empowerment programme sessions would increase intermediate outcomes of knowledge, skills, competencies and capabilities for health literacy (SRH/HIV/GBV/Mental Well-being), healthy relationships, career planning and job seeking, and active citizenry.

4. The Women of Worth empowerment sessions implemented using empathetic engagement approaches and supported by a community of peers would promote mastery, self-reflection, self-responsibility, agency and autonomy for SRH.

5. The community of peers would provide social support and a sense of sisterhood that would facilitate sustained engagement in the programme and programme impact.

6. Increased opportunity: The promotion of health services during sessions and the availability of fixed and mobile youth-friendly services as programme inputs would increase opportunities for uptake of SRH services as an intermediate outcome.

To evaluate this conceptual framework a theory of change was developed as a working model for testing a conceptual framework on how the programme would work in real life. A multi-phase, experimental mixed methods study design that is an effectiveness-implementation hybrid type I study design was used to fulfil both the effectiveness and implementation objectives of this research.[13,14]

8.5 Discussing Findings

In this study, the sustained engagement in the Women of Worth resulted in a 3-fold self-reported increase in employment that was sustained more than a year after intervention exposure with short term changes in self-reported GBV and transactional sex outcomes and increased contraception and STI service uptake. Changes in HIV prevalence were not discernible in this research due to small numbers.

This conceptual framework of effect for the Women of Worth empowerment programme developed from this research in Figure 14 suggests that in this population group, the CT was essential for sustained engagement in the programme supported using adaptive research and implementation methods to maximise intervention exposure. Sustained engagement in the Women of Worth empowerment programme allowed for intermediate pathways of self-determination that included **Agency and autonomy** to minimise HIV vulnerability; **mastery** to practice safer sex behaviour, manage intimate and family relationships and mastery in seeking

employment; the support by **social networks and capital in the community** including YFHS. The CT was shared with family and contributed to improved family relationships and increased self-esteem in the ability to meet family and social expectations for livelihoods.

8.5.1 Changes in HIV prevalence

The main outcome of the WoW study and the endpoint on which it was powered was a reduction in HIV prevalence in the cohort. This outcome was complicated by the voluntary nature of testing and the reliance on self-report for HIV outcome. We had hoped we could link the individuals to the routine provincial laboratory service data, but this proved to be difficult in practice.

The self-reported results did not show discernible changes in HIV prevalence because of relatively small number of incident HIV infections over all, a relatively small sample size for follow up measures in the comparator arm, and the relatively short follow up period. From the latest reported national HIV incidence for AGYW 15-24years in South Africa in this research it an estimated that the sample size would have elucidated an additional reduction in HIV incidence as a result of the CT of between 5-7.5% compared to not receiving the CT. However, the very large loss to follow up in the research reduced the power to show HIV changes. This highlights the difficulty of showing decreases in HIV incidence among AGYW and the importance of ensuring sustained engagement in these HIV programmes .

As shown the scoping review in Chapter five, this is a common problem in the research of CT programmes in the study population. The scoping review showed that there was only evidence of reduction in HIV incidence from eSwatini where CTs were conditional on education and from a lottery intervention in Lesotho. Furthermore, Stoner and colleagues in their systematic review of CT's for HIV prevention programme globally in different population groups found evidence of delayed sexual debut while exposed to CTs conditional on education and found only 3 of 8 studies reduced HIV incidence or prevalence.[288]

Part of the challenge in the review by Stoner and colleagues, the scoping review discussed in chapter five and this WoW study, was the non-availability of HIV biomarkers. Furthermore, as shown in the scoping review in chapter five, very few studies measured durability of HIV changes. The study in Lesotho showed durable reduction in HIV incidence after a year of removing the CCT intervention.[311] The longest durability study of CT's is by Baird and colleagues which tested measures two and a half years after removing the CT.[317] This study by Baird and colleagues however showed that reductions in HIV prevalence shown during the programme in those who received UCTs were not durable after two and half years of removing the CT.

This highlights that discerning changes in HIV prevalence and incidence in CT studies is a global challenge. There is however emerging evidence shown (chapter five) that suggests that CT programmes that are augmented with other developmental interventions could perform better that CT's on their own. Evidence of HIV infection reduction in these studies is however not yet available and when available would be important to show durability.

8.5.2 Significant and sustained increase in employment addressing structural determinant of HIV vulnerability.

Addressing unemployment in AGYW as a structural determinant for HIV is a sustainable development goal and a priority for the "*2063 Agenda of the Africa we want*".[366,368–370] The finding of **significant and sustained increase in employment** more than a year after exposure of the Women of Worth Empowerment programme is important in the context where half of young people, especially women in Southern Africa are unemployed.[92] Young women in the study context experience increased HIV vulnerability due to financial, social and gender determinants. High unemployment and low high school completion rates increase transactional and inter-generational sex due to unequal sexual power relationships.[230,231]

Evidence for the direct association of unemployment and HIV prevention is, however, sparse for young women in ESA in young women. A systematic review of the relationship of employment and the HIV continuum of care showed a positive association. Employed persons were more likely to be diagnosed early, retained in care, adherent to treatment and health visits and virally suppressed.[371] Employed women older than this study population have been shown to have reduced HIV vulnerability associated with being more educated, economically empowered, delaying age of marriage and when married likely to be more independent and have more equal decision-making power in the household with their partner compared to women who are unemployed.[372]

The extent of the increase in employment in this research was unexpected in the theory of change developed for the Women of Worth empowerment programme. It was surprising that the employment interventions in the Women of Worth programme would overcome the very high background youth unemployment rate in the study area.

However, in South Africa, unemployment increased in young people of a similar socio-economic profile during the study period, suggesting credibility of these research findings.[373]

Two of the twelve Women of Worth empowerment programme sessions addressed job seeking, and "Job Hunt", a session aiming to support the setting and achieving career goals was one of the top five most enjoyed sessions. It is feasible that the Women of Worth programme may have directly improved participants' mastery in setting career goals and meeting them. Participants were provided with computer and internet access as well as assistance in curriculum vitae development and job applications on request at the study

internet café. That the effect of these interventions may be durable for more than a year after exposure is encouraging albeit the durability findings are based on a small sample size[366]

In this study, more than 70% of participants at baseline were unemployed but actively seeking employment. This was in all study groups even in those participants that were lost to follow up at the end of the research and was similar to estimates for this age group in the sub-districts where the research was done.[49] This makes the generalisability of the finding of increased employment after exposure of the Women of Worth empowerment programme to poor, urban, out-of-school, young women in Cape Town, plausible.

Even though the findings on increasing employment may be plausible, it must be noted that as employment was self-reported, social desirability and other unmeasured confounders may have biased these results.[366]

8.5.3 Reduction in GBV and transactional sex while exposed to intervention.

The findings on SRH/HIV risk factors other than employment, were mixed in this research and when found to be beneficial, this was only effective during exposure to the intervention. Self-reported reductions in GBV and transactional sex and increased uptake of SRH services were reported only while there was exposure to the intervention. This effect may have waned with time and the study may have not been powered to detect the effect in the follow up period due to the small sample size at follow up. The direction of estimates in the follow up period still shows potential reductions in GBV, transactional sex and increased of uptake of SRH services even though not powered to show statistical significance. This finding therefore remains promising and should not be easily discounted.

As discussed in Chapter two, UNAIDS has reported GBV as an intractable structural driver of the HIV epidemic that is associated with a 1.5 times increase in HIV acquisition.[41] Globally, 243 million women and girls (aged 15-49) have experienced GBV in the last 12 months and 16%-30% of women in the Eastern and Southern African region experienced IPV in the last 12 months.[41,112]

In the context of the Women of Worth empowerment programme, at baseline 1 in 5 participants reported GBV and about 15% reported transactional sex. With such high burden, interventions that show even a modest reduction may require serious consideration and exploration to optimise their effect.

A review of CT effectiveness for GBV prevention found mixed results, although augmenting the cash with “gender transformative” and empowerment skills-building interventions improved outcomes.[353,374] Augmenting CTs with capacity development interventions that strengthening self-agency of participants ensured durable safer sexual behaviours.[317,337] The Stepping

Stones Intervention that included a CT and a “gender transformative” intervention improved women’s earnings and their experiences of GBV.[187]

Emerging mechanisms for CT programmes to reduce GBV and transactional sex suggest a need for financial agency to control lives and sexual relationship power.[335,375] In the scoping review, financial independence due to the CT given to young women have improved their relationships with intimate partners, with improved negotiation power, reduced reliance on men and reduction in GBV.[128,285,287]

Findings from this evaluation of the Women of Worth empowerment programme, showed self-reported financial independence while exposed to the Women of Worth empowerment programme with the CT. Financial control of participants’ lives was shown by the autonomy in their spending decisions and managing their money that was evident in other CT studies of AGYW in Malawi, Tanzania and rural South Africa.[329,376,377] The size of the CT is however an important consideration in understanding what is reasonable to expect the cash to achieve. The findings from the RESPECT Trial in Tanzania suggested that women with lower relationship power might require higher cash values to change HIV vulnerability.[333]

Pettifor and colleagues explored the mechanisms to reduce transactional sex of the DREAMS Sauti Project cash-plus programme in Tanzania focussing on AGYW. These colleagues suggested that the ability for the young women to provide for their basic needs limited a reliance on men and transactional sex and that the empowerment from the programme increased agency, decision-making, self-esteem and future orientation which resulted in partner reduction and curtailment of sex frequency.[336] This effect was shown to be more pronounced in poorer participants.[336]

In a systematic review of social protection (that included employment) on HIV testing and treatment outcomes in AGYW, these interventions were shown to reduce, transactional sex in those who used their CTs to buy basic needs.[378] Half of the participants in the Women of Worth empowerment programme had no income and when given the CT they spent most of it on basic needs and in particular food for themselves and their families. The participants in this study were likely at the socio-economic level that could be amenable to the effects of the CT.

Other authors have shown that CTs received by young women in similar settings improved their bargaining power in sexual relationships, chose safer sexual partners who are of similar age, reduced sex frequency and reduced sex for basic needs such as food thus reducing IPV, transactional sex and risky sexual behaviours and minimising HIV exposure.[300,316,335,343,357] The low levels of high school education completion, high unemployment and poverty levels in the Women of Worth participants may have resulted in their exclusion from the financial and knowledge economy and hampered their ability to capitalise on these resources to practice

safer sex practices and reduce HIV vulnerability and safely transition into adulthood.[39] The sustained increase in employment may have played a role in addressing social determinants of HIV vulnerability and given participants financial resources to address their needs.

In this evaluation of the Women of Worth empowerment programme, in interviews participants reported that at baseline they lacked self-esteem, adequate knowledge of SRH and life skills. After exposure to the programme with an inclusion of a gender-based session, the Women of Worth empowerment programme may have increased health literacy on GBV and transactional sex and increased mastery in managing relationships and discussing sex and sexuality. A sense of economic independence, hope and aspirations for the future coupled with increased knowledge has been shown to increase self-esteem and decision-making on intimate partners and refusing some sexual partners.[357] It is plausible that in the Women of Worth empowerment programme evaluation, the newfound self-confidence, self-esteem and efficacy from sustained engagement in safe, empowering and respectful spaces of sisterhood with empathetic engagement by facilitators may have given participants feelings of self-reliance and voice with intimate partners and family members. This could have potentially led to autonomy and agency for SRH and seeking livelihoods and mastery in managing intimate partner relationships and intimate partner choices that may have reduced GBV and transactional sex.

Caution should be used when considering increased self-esteem to improved SRH behaviours because other factors such as patriarchal power dynamics may be a much stronger determinant in negotiating safe sex in AGYW.[379] However, increased self-esteem together with improved competence in managing relationships with intimate partners was well described by Women of Worth empowerment programme participants.

The woman-only safe, empowering, respectful spaces with multiple human development interventions have been shown to transform gender norms in AGYW in Africa.[253,336,380] Participants experienced the Women of Worth empowerment programme as a safe, respectful, and reflective space of sisterhood with social networks and social capital in their community. The peer facilitators practiced active listening, empathetic and non-judgmentally engaged participants and delivered the Women of Worth empowerment programme intervention to an acceptable standard.

The evaluation of DREAMS in Malawi has confirmed the effectiveness of peer facilitators of programmes similar to the Women of Worth empowerment programme who were found to be a good resource of knowledge, support and empathy for AGYW participants and contributed to the success of this programme.[381]

Experiences in Uganda and Tanzania have shown the value of group participation in facilitator managed, female-only, safe, respectful and reflective spaces for life skills development as supportive environments to develop self-determination for health and livelihood outcomes.[382]

A meta-analysis of techniques to promote motivation for health behaviour change, however, found mixed results for group co-operation, suggesting that it evoked a sense of belonging but may weaken competence and self-determination when apart from the group.[144] This alludes to the complexities of behaviour change.

Violence related to receiving cash in the context of multiple deprivation could be a concern. However, in a global review of IPV as a result of women receiving CTs and possibly changing power dynamics in relationships has found mixed results.[383]

In the Women of Worth empowerment programme study, intimate partners played a negligible role in providing financial support to participants at baseline nor participated in decision-making on the CT spend. There was also no record of IPV reported as a result the CT in both the survey and the interviews. There were, however, minimal instances of violence reported perpetrated by family members that require further investigation. However, this could be similar to situations described by Baird et al, that participants in Malawi receiving the CCT experienced psychological distress when the CT became an important family income source.[384] Generally, in the Women of Worth empowerment programme study, mothers appeared to play more of a positive role because none of the participants who reported that financial decisions were made by their mother reported violence. This positive role of mothers has also been described in Tanzania.[336]

The findings of the Women of Worth empowerment programme evaluation of self-reported reductions in GBV and transactional sex while exposed to the Women of Worth intervention is corroborated by emerging evidence in similar settings and highlights the promise of cash-plus interventions such as the Women of Worth empowerment programme.

8.5.4 Uptake of SRH services and other behaviours

Findings from this evaluation of uptake of SRH services and other behaviours was mixed. Uptake of contraception and STI treatment services was increased at programme completion but HIV testing in the last 6 months, condom use at last sex and perception of HIV risk were reduced.

The Women of Worth empowerment programme promoted and made accessible YFHS that may have impacted the increase in uptake of SRH services. As discussed in Chapter three in the literature review, there is some evidence on the effectiveness of YFHS access and SRH outcomes.[180,201] A systematic review of youth-friendly services, though largely from poor quality studies with significant bias showed reduced teenage pregnancies, increased

contraception uptake, increased knowledge and patient satisfaction.[201] In the Women of Worth empowerment programme evaluation facility satisfaction was increased and uptake of contraception and STI services was also increased suggesting the value of YFHS in the study population.

CTs augmented with developmental and “supply-side” interventions such as behaviour change interventions and youth-friendly services have been shown to be more effective than cash only interventions.[12] Even though no incentives were given in Women of Worth empowerment programme to directly motivate health services uptake; the attention to overall quality improvement and promotion of YFHS accompanying the developmental sessions may have at least partially addressed "supply issues" and resulted in the observed increase in contraception and STI treatment uptake. In the Women of Worth empowerment programme the CT, the empowerment skills-building programme and the availability of HIV health information and testing services may have increased motivation, agency and mastery in practicing safer sexual behaviours as shown in other studies.[337,385]

The high baseline HIV testing rates in this population were in keeping with other similar populations in South Africa and likely explains our inability to show an increase in HIV testing rates. These rates declined slightly at follow up although this was not statistically significant. This remains unexplained in the study.

The incongruent, poor HIV risk perception, a significant predictor for the adoption of health-promoting behaviour, in our participants was concerning. [386,387] This incongruent HIV risk perception has been identified in other studies.[388] This may result from HIV being deprioritised in this study context of multiple deprivation, as there is evidence that poverty-related stressors such as unemployment, low education, and community violence, may override stressors or risk perceptions related to HIV/AIDS in poor communities.[368,386,388] The very high loss to follow up (LTFU) in the "care" group suggests that rewarding attendance, which ordinarily may be perceived to have less immediate value and importance compared to other needs in this study population. This requires further study and research.

The Women of Worth empowerment programme participants self-reported that financial independence and the increased knowledge in SRH, healthy relationships and life skills improved partner relationships and increased confidence to discuss sex and sexuality. However, the study did not show an increase in condom use as would be expected and participants. The poor HIV risk perception may be associated with the null finding in condoms use.[386–388] This requires further research and exploration and highlights the complexity of behaviour change, HIV risk perception and the potential power of patriarchal dynamics in the negotiation of condom use by AGYW.[379]

With regards to the implementation of the Women of Worth empowerment programme, the poor referral to fixed health services could perhaps reflect the perceptions facilitators had on the services offered at these facilities compared to the mobile health services that frequented the community venues. In the Zimele appraisal it was reported that even though nearly 80% of the 24 health services were classified as adolescent and youth-friendly, all facilities scored poorest in facility management buy-in of the service and thus the service was not able to deliver at its full capacity.[269]

The QR code innovation to try to facilitate health facility and service referral was very difficult to implement, especially because the scanners at the receiving health facility were not universally implemented. This was a cumbersome solution that did not work. A real time solution with biometrics at the health facilities linked to the community venues would have required much more investment that was out of the scope of the Women of Worth empowerment programme project and budget.

These challenges in implementation and the performance of facilitators may have had an impact on the adoption of health SRH/HIV behaviours. On average the fidelity score for the Women of Worth Empowerment programme was about three out of five suggesting that it was good delivery that could be improved. It remains to be seen what the impact of such improvement could be, but it is feasible that it could further improve uptake of healthy SRH/HIV behaviours.

8.5.5 Sustained Engagement

The promise of a CT in the Women of Worth Empowerment programme may have nudged participants to register for the programme and provided extrinsic motivation for intervention exposure. The cash not only benefitted the participants but was shared with family and improved family relationships which may have also provided an incentive to remain in the programme. Adaptive research methods that responded to contextual factors were found to also improve uptake and retention of the programme ensuring maximal exposure to the intervention.

Once participants received sufficient exposure to the intervention, they ultimately gained autonomy, agency and mastery for safer sex behaviours and seeking employment. This seems to suggest that in this research intrinsic, extrinsic and mastery may have been integrated in study participants to promote sustained engagement as discussed in Chapter three in the literature review.

The “UNAIDS’ Fast-Track response for ending the AIDS epidemic by 2030” seeks to ensure optimal coverage of evidence-based interventions.[158] UNAIDS has thus proposed a doubling of global investment in the implementation of evidence-informed primary prevention

services.[389] Many HIV prevention programmes require attendance at behavioural and informational capacity building sessions requiring sufficient session exposure and session attendance.[390] To ensure impact of these dollars, implementation of programmes must ensure maximal exposure of these interventions and address contextual barriers to reach those in need.[185,391]

Sustained engagement is essential. To ensure the effectiveness of interventions to reduce HIV vulnerability there must be sufficient intervention exposure.[390] Finding and holding participant attention of young women who have recently completed secondary school; likely have at least one child, are unemployed but actively seeking opportunities to improve livelihoods and are highly transient in urban areas is difficult. Findings from DREAMS; the adolescent and girls HIV prevention programme of PEPFAR in 10 countries in Africa are that the DREAMS programmes were more accessible to younger people who were in school.[253,265,266] This highlights the importance of the findings of sustained engagement of young women in the Women of Worth empowerment programme.

The findings of the Women of Worth empowerment programme suggest that sustained engagement was enhanced by access to the CTs providing extrinsic overlayed on already existing intrinsic motivation for health and livelihoods. CTs also benefited participant families and supported participants to meet family and social financial expectations and improved family relationships. Furthermore, adaptive implementation and research methods ensured sustained engagement by addressing contextual factors.

The role of CTs in sustaining engagement

Receipt of a modest CT in the Women of Worth empowerment programme increased young women's sustained participation in the Women of Worth empowerment programme by 60-fold.

A Malawian study found that only about half of AGYW participants were retained, in the intervention arms that had a behavioural intervention (BI) but no CT.[392] Similarly, in a South African study to enhance PrEP adherence, a CT (ZAR300) conditional on blood drug levels led to better adherence but only during the period that the CT was given.[171] The Stepping Stones and Creating futures modular intervention to reduce IPV and promote healthy SRH behaviours implemented in urban eThekwini, in Durban South Africa, provided cash incentives to both cases and controls. Women in the control arm received more money than cases to ensure their sustained engagement. As a result, the retention rate in both cases and control arms were over 90%.[187]

This challenge of sustained engagement of young women in HIV programmes could be due to rapidly changing developmental transitions with increasing expectations related to adulthood and structural challenges of multiple deprivation, fractured family lives and

unintended pregnancies.[296] Young women constitute a large proportion of the unemployed in Africa.[93] Young women in similar settings may have competing priorities of sustaining their health, livelihoods and caring for their children and families. This may compromise sustained engagement in programmes that require repeat attendance because young women are busy looking for work, working informally, or have become despondent.[93,393]

This was illustrated in this research where at baseline our participants demonstrated low socioeconomic profiles with high rates of unemployment but actively seeking, fractured family structures, early parenthood and HIV risk behaviours that were not unexpected for this health sub-district.[49] Reported HIV prevalence in young women in the study area was 6.2%, similar to findings of this research of 5.7%.[49] Very few participants could be retained in the programme without the cash incentive, and it was difficult to locate participants for long term follow up in the Women of Worth empowerment programme.[366] More than 70% of participants who were lost to follow up could not be contacted after three call attempts.

The significant effect of the CT in the Women of Worth empowerment programme in retention is consistent with literature on mechanisms of CT in similar programmes in similar settings and profile of young women.[149,253,329,376] This evidence highlights the potential power of cash to address the challenge of engagement and retention rates of young women.

As discussed, the high loss to follow up rate in the "care" group suggests that rewarding attendance, even modestly, may be necessary to “nudge” individuals to engage in the programme. Mechanistically, the CCTs may have provided a means to capture and hold participants’ attention and so support sustained engagement and increased exposure to session content.[149,366]

The research conceptual framework that the CT given conditional on the attendance of 12 evidence-based facilitator-led Women of Worth empowerment programme sessions would provide financial incentives and reduce barriers for sustained participation and ensure an output of recruitment and retention in the programme was tested and found to be valid. The CT seized and held young women’s’ attention sufficiently for them to get the full benefit of a prevention intervention that involves several sessions over time.

Extrinsic and intrinsic motivation

Intrinsic motivation, when actions are taken just for their inherent satisfaction, is a key component of self-determination and is important for initiating and maintaining healthy lifestyles, for self-care in HIV and mental well-being.[144,394–398] As discussed in the Literature review in Chapter three, intrinsic, extrinsic and achievement motivation (mastery) can co-exist. Locke and Schattke have argued that the integration of the three kinds of motivation is the ultimate objective.[141] The findings of this study showed that the CT provided extrinsic

motivation, overlayed on intrinsic motivation and the need for mastery for health and attaining livelihoods.

Most participants who completed the study valued addressing health and livelihood capacity needs more than the cash received but were cognisant that they needed cash for their day to day needs and thus for their sustained engagement in the Women of Worth empowerment programme. Although this research did not test for intrinsic motivation in those who did not complete the Women of Worth empowerment programme, the findings showed that most of the programme participants who received "care only" were not retained in the programme. It may be reasonable to suggest that, in the study context, intrinsic motivation alone is not adequate to ensure sustained engagement in a multi-session SRH/HIV empowerment skill building programme for young women. In those who completed the Women of Worth empowerment programme, the extrinsic motivation of cash co-existed with the intrinsic motivation of participating in the programme not purely for the money but because participants enjoyed the programme and were interested in building their capacity for better SRH and gaining livelihoods.

These findings are consistent with the life phase of transitioning into adulthood where seeking independence, gaining mastery and developing a cohesive sense of self is a high priority.[23] Intrinsic motivation for capacity development and gaining livelihoods corroborates findings from other studies including from rural South Africa in the HPTN068 CCT trial in which participants (young women) had a deep seated desire for economic independence and were willing to take actions to achieve this.[356,399]

Gangaramany and colleagues in their research of AGYW receiving CTs in Tanzania highlighted the importance of self-agency, a positive social image; power balance and respect, emotional and economic security as a pathway to reducing HIV vulnerability further emphasising the need for the integration of intrinsic, extrinsic and achievement (mastery) motivation.[337]

CTs also benefited participant families and strengthened social capital.

Studies have shown that what young women spend their money on is determined by their context. In Malawi, where the family also received a CT and in rural South Africa where there were no expectations to contribute to household costs, the CT was largely spent on personal items such as toiletries and clothing.[376,377,399] In this study and in the Tanzanian study the spend was mostly on food and livelihoods for participants and their families.[400]

In rural South Africa the cash, also supported adolescent transitions to independence by funding the costs of improving their personal appearance and engaging in a consumerist lifestyle that asserts status power within peers, this was also found in older participants.[329] A

study in Johannesburg South Africa found that adolescent girls were more likely to spend their money on their families than adolescent boys.[128] In Tanzania, young women receiving CTs also shared it with the family members and husbands as was in the Women of Worth Empowerment programme.[126]

In the Women of Worth empowerment programme CTs did not result in a dependency and "handouts" culture in fact the cash was spent mostly on participants and their families. The Women of Worth empowerment programme study found that due to a strong sense of family responsibility, urban young women were more likely to forego personal items to provide for basic and developmental needs for themselves and their families. This was a nuance that has emerged from the research that may provide additional insights into the understating of the mechanisms of CTs in Eastern and Southern African young women.

Even though Women of Worth empowerment programme participants did not explicitly report pooling their resources with their family, their spending decisions appear to be influenced their family contexts and they spent their money on family needs. This kind of pooling of resources by women receiving old age and child support grants, for the benefit of all family members has been described as a practice of intergenerational solidarity.[401] Wamoyi and colleagues in Tanzania corroborate this and found that CTs improved family and intimate relationships.[335]

These findings suggests that in our context, the cash impacted the participant's family financially and socially with improved family relationships and this has been described by others.[328,337] These findings suggest that it is likely that sustained engagement was supported by participants gaining financial independence and meeting family and social financial expectations and strengthening social networks and capital.[128,335,336]

Adaptive implementation and research methods ensured sustained engagement.

AGYW in urban areas have been shown to be particularly difficult to recruit and retain in HIV prevention programmes in similar settings especially given the challenges of their peri-urban environments and rapidly changing developmental behavioural and structural transitions.[296]

Adaptive implementation and research methods were integral to the research and implementation process of the Women of Worth empowerment programme study that could be seen as an example of implementing complex intervention in a community setting impacted by rapidly changing contexts. These methods were used to ensure sustained engagement and maximum intervention exposure. Nearly 60% of all participants completed the modified programme with randomisation and over 80% completed the modified programme at scale in the demonstration phase.

Implementation modifications based on the RE-AIM framework, were executed in the Women of Worth empowerment programme with adequate empathetic facilitation practices and resultant increased programme uptake and retention. The RE-AIM framework supported the review and modification of the delivery of an improved programme that increased exposure to the intervention and increased the likelihood for programme impact.

The most efficient programme delivery model was one that was flexible and more frequently available over a shorter time span. In the RCT phase, retention was increased 23-fold because of study modifications and C+C increased retention 60-fold. This suggests that sustained engagement in efficient, complex, layered HIV prevention interventions in the real world setting of urban, low income, young women in South Africa is likely to be significantly improved if individuals are incentivised with a small CT and a flexible programme is offered on a relatively shorter time scale.

The challenge of ensuring adequate intervention exposure through adequate accrual speed and improved retention rates is not uncommon in randomised control trials and often results in trial extension or modifications.[402–405] The likelihood for protocol amendments to improve recruitment and retention differs by research area with a positive correlation between trial complexity and number of protocol amendments.[405,406]

By way of illustration, important placebo controlled RCTs of oral pre-exposure ARV prophylaxis in women in Africa failed to show any efficacy due to very poor utilisation of the biomedical prevention intervention across all arms of the study.[407,408] While these interventions are evaluations of a biomedical intervention, they included behavioural and structural elements. Whilst young women adhered to the programmatic parts of the intervention (retention in care) across the board, they failed to adhere to the biomedical and behavioural

component (pill taking), choosing not to take the study product despite claiming to do so. The failure of these programmes was only apparent at the end of the study when the analysis was complete and raises the question of real time review and an optimisation approach long before study completion. This of course is not easy in placebo controlled RCTs of experimental products.

Study protocols have become more ambitious and complex, even in the implementation of real life complex layered interventions for AGYW funded by large funders with increasing complexity with reporting requirements and limited funding for implementation processes that allow co-design, review and modification to address contextual factors to improve uptake and retention.[250,253,259,263,264 339]

Rigid study designs are less compatible to changing contexts/real world problems.

Rigid study designs are often less compatible within rapidly changing contexts and complex "real world" problems. To this end, it could be argued that implementation science methods that aim to understand and overcome scale up barriers in complex and rapidly changing contexts should be playing a much stronger role in HIV prevention trials and programmes to ensure population impact.[157,215,243,244,247,248,276,409]

Complex, layered interventions may require multiple research methods and data sources to answer different kinds of questions and make meaning of findings in the real world for translation to policy and practice.[246] The UK-MRC guidance for developing and evaluating complex interventions recommends using multiple research methods and phases such that the piloting assesses acceptability and expected recruitment and retention challenges, even though these may differ during implementation especially when the study has multiple sites.[246] This approach was used for the Women of Worth empowerment programme study. This is however, not regularly practiced. In a review of RCTs funded by the UK's National Institute for Health Research , 60% of trials did not undertake a pilot prior to implementation.[404]

The significant improvement in uptake retention and efficiency after modifications in this research corroborates the benefit a pilot phase may have in trials or programme implementation of complex layered interventions. The findings from the Women of Worth empowerment programme that show that adaptive research methods increased exposure to the intervention confirm this. Furthermore, efficiency could have been influenced by time and timing. The efficiency in the demonstration phase may have been influenced by the project nearing an end and participants and staff working more efficiently in recognition of this.

A useful framework for adaptations made during implementation whilst maintaining intervention fidelity has been developed that includes a coding and scoring system that would

allow uniform description of modifications and assessing the extent of modification.[391] Collins and colleagues have hypothesised that to develop “effective, economical, efficient, and scalable” complex interventions a multi-phase optimisation strategy is required.[410] In this strategy they modelled the design of a complex intervention using small, randomised experiments.

These experiments assess the individual performance and interactions of intervention components against pre-determined implementation optimisation criteria such as cost per participant. This optimised complex intervention is then evaluated for effectiveness using a RCT.

Getz and colleagues suggest that researchers currently view amendments as a major challenge to be avoided mostly due to the inherent delays these bring, instead of being a positive and integral part of the research process to maximise the probability of success for the intervention in the real world.[411,412] Whilst there was a pause after the pilot phase in the Women of Worth empowerment programme, the overall improvement in the execution and increase exposure of the intervention was worth the extension in overall time.

8.5.6 Implications for policy and programming

In Chapter four, the Women of Worth empowerment programme was shown to be part of a national AGYW HIV programme of the GF supported intervention of the SANC responsible for the multisectoral response to HIV, TB and STIs in South Africa. The Women of Worth empowerment programme was one of two conditional CT programmes for young women aged 19-24 years implemented and evaluated to test feasibility and gain lessons to inform future programming. Three policy implications emerge from this research; a) CTs are an important component to ensure engagement of young women in similar study settings; b) cash-plus interventions could enhance developmental opportunities in young women and c) adaptive implementation methods that are contextually responsive are essential in community based research for AGYM.

CTs are an important component to ensure engagement of young women.

In this research, CTs were found to be critical to ensure engagement of young women 19-24 years with a profile of multiple deprivation, who are out-of-school, unemployed but actively seeking employment, likely have at least one child and live in fractured home and social environments. Participants who did not receive cash were almost universally lost to follow up. The young women in settings like the Women of Worth programme have competing priorities as they transition into adulthood facing unfavourable livelihood risks due to gender inequalities and social determinants of heath.

The first implication of this research is that CTs are an important component to ensure engagement of young women in similar settings to this research. In young women 19-24 years who experience multiple deprivation, out-of-school with at least one child, unemployed, have no income and/or dependent on state grants and/or relatives cash-plus interventions are worth considering. This group of the population is young and a resource for the nation and its future but is transitioning into adulthood with high HIV vulnerability, unemployment, low income and gender inequality that is hampering their ability to meet their true potential.

Cash-plus interventions could enhance developmental opportunities.

The second implication is that cash-plus interventions could enhance developmental opportunities in young women that can go beyond HIV prevention. Evidence has shown that even though CT's are important, they are not the panacea for HIV prevention in AGYW. CT interventions that are augmented with other human development and supply-side interventions are emerging as a promising tool in the menu of options of interventions for HIV prevention in AGYW.

This research shows that the Women of Worth Empowerment Programme, a cash-plus intervention, seems to have sustained effect in increasing employment, a key structural determinant of HIV vulnerability and well-being in this population group. Even though this research did not show changes in HIV infections and showed reduction in risky sexual behaviours only during intervention exposure, it is worth considering as a policy option for profile of young women similar to those in the Women of Worth Empowerment Programme. The direction of the effect of risky sexual behaviours during follow-up is promising and it is feasible that a larger sample size could have shown a statistically significant effect.

The Women of Worth empowerment programme findings suggest the value of a "young woman-centred" programme that uses a CT to ensure programme participation while addressing needs of financial and health literacy, work readiness, job opportunities and supportive social environments to promote SRH and safe transitioning into adulthood for young women.

This research contributes to building a strong case that cash-plus interventions could be transformative and reduce HIV vulnerability for poor urban out-of-school young women in ESA implemented at scale.[149,253,336,349,392,413–415] The findings from the Women of Worth empowerment programme, a cash-plus intervention, of sustained employment for more than a year after the intervention was removed addresses an important structural determinant of HIV in a context of very high youth unemployment.

There is a lack evidence of the association of employment and HIV prevention in young women in ESA.[371] There is however, evidence that employment is associated with better HIV

continuum of care health outcomes and other health outcomes in young women in ESA.[372] This suggests that there could still be an effect of the Women of Worth empowerment programme on reducing HIV infections sometime in the future.

No incentives were given to directly motivate health services uptake but a health systems strengthening intervention was implemented within the broader Zimele programme. Increased facility satisfaction, increased uptake in contraception and STI treatment services found in the research suggests that YFHS were effective during intervention exposure and improved opportunities to access to sexual reproductive services. Experiences of GBV and transactional sex were reduced during intervention exposure.

In this study the pathway of effect for the programme was in building self-determination that ignited agency, autonomy and gaining mastery in safe sex behaviours and seeking livelihoods supported by a social network and resources. Building self-determination and increasing employment in this vulnerable population is a compelling reason to consider the Women of Worth empowerment programme to reduce HIV vulnerability in young women. This programme may improve motivation and agency for safe transitioning into adulthood for this population group that is beyond HIV.

The results of this research suggest that cash-plus interventions could be a very good long term investment in young women empowerment and development. This however can only be confirmed with further cost effectiveness studies that can evaluate the durable impact of these interventions beyond HIV and SRH change.

The need for adaptive implementation methods that are contextually responsive.

The third implication is that, during implementation of complex interventions in community setting adaptive implementation methods should be considered to ensure contextually responsive interventions that promote uptake and sustainable engagement.

The Women of Worth empowerment programme was implemented at the community level as part of a national AGYW comprehensive programme with good fidelity using empathetic facilitation approaches and adaptive research and implementation methods. The findings of this research suggest that a cash-plus intervention is feasible to be implemented as part of the national AGYW programme with good programme fidelity and sustained engagement.

Adaptive implementation and research methods were integral to the research and implementation process of the Women of Worth empowerment programme study. Over 80% completed the programme when they received a cash incentive to attend, and the programme was provided weekly and in a flexible manner.

This suggests that during implementation of complex interventions such as the cash-plus interventions in community settings, adaptive implementation methods should be considered as integral to the implementation process to ensure contextually responsive interventions that promote uptake and sustainable engagement.

8.6 Study Strengths and Limitations of the research

8.6.1 Strengths

The Women of Worth intervention design and evaluation was based on a theoretical construct.

The design of the Women of Worth intervention was explicitly based on behaviour change theoretical models of SCT, SDT, Behavioural economics, BCW and TDF. This allowed for the development of a research conceptual framework and a theory of change that guided the evaluation of the programme and the development of the conceptual framework to understand how the intervention may have worked in the real world. This strong theoretical basis supports the validity of the results from this research.

Strong research methodology which supported intervention exposure

The Women of Worth empowerment programme study was a multi-phase, experimental mixed-methods design or an effectiveness-implementation hybrid type I study design with effectiveness and implementation objectives. This methodology is seen as a strength as it not only allowed for the understanding of the effectiveness of the intervention, but it also supported optimal intervention exposure.

Research nested in a real-world nation programme.

The study occurred in a real context of a national AGYW programme, in partnership with provincial health and supported by the GF. This real-life context of using an intermediate like DTHF as is the practice in the National AGYW programme, coupled with efforts to document implementation phases, the modifications implemented, and their impact and lessons, improves the likelihood of these findings impacting policy and practice. This study was commissioned by SANAC and funded by the GF, and the preliminary findings of this study have already been presented to these stakeholders. The preliminary findings in Women of Worth empowerment programme have also provided supportive evidence for the rationale for structural interventions funded in the 2020-2022 GF grant for AGYW.

8.6.2 Limitations

Self-reported measures

An important limitation of the study is that many of the results are based on self-report. Social desirability bias could be at play with participants responding to what they thought they were

expected to answer. This type of response bias is particularly important when asking about topics perceived to be sensitive such as HIV and sexual behaviour. Social desirability bias can be either self-deception or impression management which results in a conscious and intentional misrepresentation of their behaviours.[416]

Secondly participants could have also experienced recall bias meaning that they do not recall past events and experiences and thus systematically under or over report events or experiences.[417]

To mitigate against these limitations, survey questions were limited to a three to six month recall period and participants answered the questions in private using the study information system and were not under the scrutiny of study staff.

Survey findings were also, triangulated with in-depth interviews and for questions that may have been sensitive, e.g., negative effects of the CT were asked in different ways and were also validated with results with literature from similar programmes.

Even though HIV biomarker tests were not used, in the analysis of the results HIV positive results were retained for all visits regardless of participant responses meaning even if a participant reported a positive HIV result followed by a negative HIV result in a subsequent questionnaire, both results were kept and recorded. Though once a participant reported a HIV positive result, this was retained and not reported as HIV negative even if a subsequent result was self-reported as HIV negative.

Very large LTFU and discernment of HIV status

The Women of Worth empowerment programme study had an exceptionally large LTFU in the "care only" group. Those young women who were lost to follow up could have been even more vulnerable than those retained in the programme. Even though during the statistical analysis variables that were different at baseline in those that were LTFU were controlled for; those who were LTFU could have had other vulnerabilities that were not measured.

The lack of sustained participation in the "care" arm was the greatest confounder in the WoW study and this unexpected outcome impacted study power and effect sizes. Lack of "control arm" follow up is a limitation in CT studies generally and durability is rarely tested for this reason. Thus, the follow up data in this research that is beyond the CT period provides important insights.[126,127,336] However, caution should be exercised in interpreting this data due to the small sample size.

The large LTFU impacted the power of the study to detect HIV status and other risky SRH/HIV changes immediately after the study (for HIV status) and at follow up (for HIV status and other SRH/HIV behaviours). As shown in the sensitivity analysis for the sample size discussed in

the Research Methods Chapter six; the sample size for Phase 1a and 1b was powered to detect an additional impact on HIV incidence of 7.5% as a result of the Women of Worth empowerment programme. The follow up sample size was powered to detect an additional reduction of 12.5%. This may have been overly optimistic.

To partially overcome the limitations of LTFU and the use of self-reported measures, links between study records and provincial health records to validate biological indicators and to perform passive monitoring of HIV status and uptake of SRH/HIV services were sought, but unfortunately could not be established. As an alternative, a small sample of participants who had been in the programme between 6 – 30 months were invited to complete the questionnaire for the third time to estimate durability of impact. Budget constraints limited the number of participants that could be invited and offered the R50 incentive to a 1000 participants.

In the qualitative studies attempts were made to understand the factors that influenced those who did not receive cash but remained in the programme. From the qualitative study, there was a very small proportion of young women who were retained in the study and did not receive cash. From this small sample, it appeared that those who were retained and did not receive cash were motivated by their need for knowledge and self-development. This is an important finding since it underpins the value of the "care" component of cash +care. Unfortunately, the follow-up component of this research that included both completers and non-completers did not include a qualitative element which could have provided important insights to understand the motivations for sustained engagement for those who did not receive cash.

The inability to link the research data with Western Cape Government Data Centre data also limited the ability to use the Intention to treat (ITT) analytical method which was planned in the research protocol. This is because there were no outcomes for those who were loss to follow up who were a very large group which made the regression models unreliable.

HIV status reliability and discernment of HIV status in this and future programmes could be strengthened by the inclusion of obligatory HIV/STI testing pre- and post-intervention to validate self-reports, but with the very real trade off that this could limit participation and be perceived to undermine voluntary testing.

Lack of durability in the measures for HIV and SRH behaviours

The scoping review discussed in chapter five showed that the evidence for durability of HIV and SRH measures in the study population is lacking and this finding was also shown by others.[149,212,220,288,289] There is currently limited evidence showing durable changes in HIV incidence. The study with the longest follow up period showed that the changes in HIV prevalence were not durable after the removal of CT.[317]

Although my research did not show changes in HIV infections due to limitations already discussed at length; they did show some changes in SRH behaviours that were statistically significant immediately after the programme. The direction of SRH estimates in the follow up period showed reductions in GBV, transactional sex and increased uptake of SRH services. Unfortunately, as discussed, the sample of young women in follow up was too small to definitively show a significant change.

Strategies to improve the durability of CT interventions could include augmenting cash with other developmental opportunities that go beyond HIV and health. These developmental opportunities could support young women to address key social determinants of health that include building their agency and autonomy, navigating family and intimate relationships, processes of seeking work and other developmental opportunities and advocating for change in their own community. In this way, the cash transfer may be substituted by meaningful and sustainable income for the young woman.

The very strong results of reducing unemployment in this study population and showing that the impact could extend to the family could also be a strong advocacy tool to show that CT's can impact other national and regional developmental priorities and may therefore warrant further policy consideration.

Further research in cost effectiveness and identifying populations in whom CT interventions would have the greatest impact would also contribute to policy considerations.

Fidelity assessment

A limitation of fidelity assessment is that it did not investigate the reasons for inconsistent interventions delivery among the facilitators. This could be augmented on the current tool and be the subject for future research.

8.7 Chapter Summary

The disproportionate burden of HIV vulnerability in AGYW is driven by structural and social determinants of health that include high poverty rates, low high school completion rates, low SRH/HIV knowledge, high unemployment rates and gender inequalities.[3,59,67,98,103,109,110]

The scoping review of the effectiveness of CT interventions and their pathways of effect to reduce HIV vulnerability in AGYW in ESA revealed limited evidence for CTs on their own reducing HIV infections. There was however promising though limited evidence for the effectiveness and understanding of common pathways of effect of cash-plus interventions in AGYW in the Eastern and Southern African region to reduce HIV vulnerability due to the confounding by contextual factors. This gap in knowledge is good rationale for this research that was part of a SANAC, GF-funded programme for reducing HIV vulnerability in young

women in South Africa. The evaluation of the Women of Worth empowerment programme purpose was to inform policy and practice in South Africa by assessing the implementation and evaluating the effectiveness of the CT component of the Women of Worth empowerment programme to reduce HIV vulnerability in young women aged 19-24 years in Cape Town, South Africa.

A multi-phase, experimental mixed methods study design that is an effectiveness-implementation hybrid type I study design was used to fulfil both the effectiveness and implementation objectives of this research to inform policy and practice in South Africa.

The conceptual framework of this research of how the Women of Worth empowerment programme would work in the real word was verified. Local contextual factors did require adaptive research methods to ensure efficient recruitment, retention and programme delivery. The CT given conditional on the attendance of 12 evidence-based facilitator-led Women of Worth empowerment programme sessions provided financial incentives and reduced barriers for sustained participation and ensure an output of recruitment and retention in the programme. Once sustained engagement is attained. The Women of Worth empowerment programme sessions increased intermediate outcomes of knowledge, skills, competencies and capabilities for health literacy, healthy relationships, career planning and job seeking. The Women of Worth empowerment sessions implemented using empathetic engagement approaches and supported by a community of peers would promote mastery, self-reflection, self-responsibility, agency and autonomy for SRH. The community of peers provided social support and sense of sisterhood and facilitated sustained engagement in the programme and programme impact. The promotion of health services during sessions and the availability of fixed and mobile youth-friendly services as programme inputs increased opportunity for uptake of SRH services as an intermediate outcome.

CTs were successful in retaining urban, low income, out-of-school, unemployed young women in a multi session SRH/HIV prevention programme. Those retained in both study arms (mainly those from the C+C arm) increased more than 3-fold their employment status immediately and after more than a year post the Women of Worth empowerment programme intervention. The significant and sustained increase in employment is an important social determinant of HIV vulnerability in the context of very high youth unemployment.

The impact on new HIV infections was not discernible due to small numbers and findings on risky sex behaviours and GBV were mixed and if found to be beneficial, this was not found to be durable when the intervention was removed due. The study may have not been adequately powered to detect changes in new HIV infections and changes in SRH/HIV behaviours in the follow up period. However even modest reductions in GBV in particular in the context of very

high GBV rates and the association with increased HIV vulnerability in this study population makes the Women of Worth empowerment programme suitable for consideration in future programming.

The pathway of effect for the Women of Worth empowerment programme that may have been in building self-determination, the financial independence of participants, the sharing of the CT with family with improvements of family relationships due to fulfilment of family and societal financial obligations is a compelling finding in the context of this study of multiple deprivation, low self-esteem and capacity for HIV prevention.

The findings of this research suggest that a cash-plus intervention is feasible to be implemented as part of the national AGYW programme with good programme fidelity and sustained engagement. This research contributes to building a strong case that cash-plus interventions could be transformative and reduce HIV vulnerability for poor urban out-of-school young women in ESA implemented at scale.[149,253,336,349,392,413–415]

Even though changes in HIV infections were not discernible and changes in SRH/HIV behaviours were mixed and not powered for durability testing, the sustained changes in employment for longer than a year and modest changes in GBV may impact the structural determinants that are intractable drivers of HIV. It is feasible that evidence of HIV prevention could still emerge at a future time due to the sustained increase in employment and self-determination.

The limitations of the study are that the results are based on self-reported measures; those who did not receive the CT were not retained in the programme and could not be followed up and the durability assessment is based on a relatively small number of those followed up longer than a year. Longer follow up and cost-effectiveness studies may be required.

8.8 Next chapter

In the next and last chapter, a concluding summary of the research highlight the knowledge contributions of this research and recommendations for future research is articulated.

CHAPTER 9: Conclusion

In this chapter, this monograph is concluded by summarising the research context and key findings of the evaluation of the Women of Worth empowerment programme and the related implications for policy programming and future research to reduce HIV vulnerability of young women in ESA.

9.1 Summarising the context and key findings of the study.

HIV remains a leading cause of disease and death in AGYW with the Eastern and Southern African region and South Africa in particular experiencing the most significant brunt.[59] Even though significant progress has been made globally in addressing HIV in adults and young children, progress for AGYW is lagging. This disproportionate HIV vulnerability of AGYW in this region remains intractable and is driven by high levels of health inequities and social determinants.[4,5]

South Africa is the global epicentre of the HIV epidemic and the most unequal country in the world with elevated levels of poverty and gender inequality. Here AGYW carry a disproportionate HIV, STI and unmet contraceptive burden. Young urban South African women transition into adulthood with low educational attainment, high unemployment, low SRH and prospects, but with large family and parenting responsibilities due to unintended pregnancies.

These **young women are thus fighting daily for survival with many competing priorities**. They are thus very difficult to locate and engage in prevention, skills-building and other activities. These facts provide a strong rationale for a public health focus on this demographic group as they present the last opportunity to establish SRH-promoting behaviours that could result in improved health and health prospects for a more stable and successful transition into adulthood and parenthood.[3]

HIV and **COVID-19 epidemics have highlighted the impact of inequitable distribution of power, status and privilege on sexual autonomy and self-determination** resulting in HIV vulnerability in AGYW.[85] Interventions that address social determinants of health such as education completion, employment, gender norms and removing barriers to health care access have potential to reduce HIV vulnerability in young women. The gap between available evidence and implementation for workable solutions further exacerbates the disproportional burden of HIV in AGYW.[158]

There is promising evidence that CT conditional on schooling is effective in reducing early marriage, fertility, pregnancy and sexual debut, in girls not in school.[307,317] There is emerging evidence that **CTs could be more effective in reducing HIV vulnerability in AGYW when**

combined with care, parental support; health and skills-building initiatives or when linked to education or other human capacity development actions. More research is required for us to better understanding how CTs work and how we can maximise their impact to reduce HIV vulnerability at scale.

South Africa also has one of the biggest social assistance programmes in Africa and providing an **opportunity for research to inform policy and practice** related to CTs and HIV. **Cash-plus interventions** of which the Women of Worth empowerment programme is an example; are interventions that build human capabilities by augmenting the “income effects” of the **CT with additional human development components** such as behaviour change and addressing supply-side interventions to improve quality of services.[12] The evidence for these cash-plus interventions is emerging and promising but still limited.

The Women of Worth empowerment programme was **part of a national** AGYW **HIV programme of the** GF **supported intervention of** SANAC responsible for the multisectoral response to HIV, TB and STIs in South Africa. The Women of Worth empowerment programme was one of two conditional CT programmes for young women 19-24 implemented and evaluated to test feasibility and gain lessons to inform future programming.

The Women of Worth empowerment programme findings suggest the feasibility of implementing a cash-plus intervention as part of a national AGYW programme. These findings also demonstrate **the value of a "young woman-centred" programme** delivered using **empathetic facilitation approaches** and **adaptive implementation science methods** to respond to contextual issues.

These programmes for young women with a **profile of multiple deprivation**, who are unemployed but actively seeking employment who likely already have one child and are from fractured family and social contexts require a **CT to ensure programme participation and sustained engagement** while the **empowerment sessions address needs of financial and health literacy, work readiness, job opportunities and supportive social environments** may go some way to improving both SRH and youth development in young women.

The pathway of effect for this cash-plus programme was **building self-determination that ignited agency, autonomy and gaining mastery in safe sex behaviours and seeking livelihoods supported by a social network and resources**. The participants CT provided young women financial independence and was shared with family and improved relationships with families.

Even though findings on safe sexual behaviours were mixed and not powered for durability testing, it is however, feasible that **evidence of HIV prevention could still emerge at a future**

time due to the sustained increase in employment and self-determination found in this research.

9.2 Implications for policy and programming

The implications of these findings are that programmes for young women in settings similar to the Women of Worth Programme are that **cash should be seriously considered to ensure sustained engagement** in other developmental and health-promoting interventions. Young women in similar settings may have competing priorities of sustaining their health, livelihoods and caring for their children and families. This may compromise sustained engagement in programmes that require repeat attendance because young women are busy looking for work, working informally, or have become despondent.

Cash-plus interventions in community settings should also use **adaptive implementation methods to ensure contextually responsive** interventions that promotes uptake and sustainable engagement. Programme implementers and funders should expect that complex interventions implemented in the community will likely require adaptation to ensure optimal exposure to the intervention. Programme pauses, reviews and adaptations should be an integral part of implementation that is planned and budgeted for to maximise the probability of success for the intervention in the real world.

The **sustained increase in employment for more than a year** after the intervention was removed and the **building self-determination** in this vulnerable population of young women is a compelling reason to consider cash-plus interventions that are **"young woman-centred"** delivered using **empathetic facilitation approaches** to reduce HIV vulnerability in young women with similar profiles to participants. The Women of Worth empowerment programme findings suggest the feasibility of implementing a cash-plus intervention as part of a national AGYW programme.

This programme may also improve motivation and agency for **safe transitioning into adulthood for this population group that is beyond HIV and may also affect family members** of participants since participants had a great sense of family responsibility and shared their cash with family sometimes foregoing their own personal needs. This programme is worth considering for this specific population group.

One of the findings from the scoping review is that the pathways of effect for CT interventions are dependent on the context. The Women of Worth empowerment programme **may be generalisable to poor, urban, out-of-school, young women in Cape Town**, since the study sample was representative of the population. It is plausible that these results may be relevant in other similar settings with similar socio-demographic and HIV vulnerability profiles.

This cash-plus programme may contribute towards **addressing the intractable structural determinants that drive HIV vulnerability in young women.** This however requires political commitment and investment in young women as a strategy for human capital gains that goes beyond HIV outcomes.

9.3 Study strengths and limitations

The limitations of the study are primarily that the results are based on self-reported measures; those who did not receive the CT were not retained in the programme and could not be followed up and the durability assessment is based on relatively small number of those followed up longer than a year and may have reduced the study power. Longer follow up of a larger sample size and cost-effectiveness studies may be required.

9.4 New knowledge from this research

The evidence for the effectiveness of CT interventions on HIV incidence in AGYW in ESA is limited. In Chapter five, the scoping review showed that that CTs when combined with education, care, parental support, health and livelihoods skills-building were promising tool to reduce HIV vulnerability in AGYW in ESA. Evidence for durability of effects after the CT has been removed as an exposure was also limited. Similarly, better understanding of pathways of effect for these CTs to reduce HIV vulnerability in AGYW in ESA in multiple settings and contexts was called for.

This study adds to the growing evidence of the effectiveness of “cash-plus” interventions in urban, low income, young SA women. **CTs augmented by an empowerment skills-building programme increased employment 3-fold**, which was **sustained for longer than a year**. This effect and the durability for more than a year has not been shown before in a cash-plus intervention targeting HIV vulnerability in urban, out-of-school young women. Even though there is no direct association of employment and HIV prevention; employment is associated with improved health outcomes more generally.

The gaining of self-determination, autonomy, competence and connectedness to family and communities as well as increased employment are important outcomes and may **have many benefits for other health outcomes either than SRH and HIV**. This study provided evidence that CTs may also have **effects beyond the individual recipients but may also impact families.**

9.5 Recommendation for future research

Cost-effectiveness

In 2002, the Taylor Commission in South Africa recommended a Basic Income Grant (BIG) for every unemployed person between 19-59 years but this has not been implemented due to

affordability.[418] The COVID-19 pandemic has however, highlighted the very deep financial inequalities and more pressure has been placed on the South African government to revisit these proposals, including a call for a Basic Income Grant (BIG) which seems to be gaining support from the Ministry of Social Development responsible for social grants and would also benefit young women similar to our research setting.[419] Cash-plus interventions would need to be considered as the BIG is being explored in South Africa.

In the context of HIV prevention, in Africa this intervention could be regarded as high cost and perhaps unaffordable, especially since its cost-effectiveness is undetermined but worth considering. The World Bank has found that CTs in the Eastern and Southern African region need to provide >20% of household consumption to have a significant impact on health and development.[420] In South Africa, the value of the CT given to Women of Worth recipients is about a third less than the value of the national CSG for one year which itself is about 30% of the national poverty line.[421]

Despite this, the gaining of self-determination, autonomy, competence and connectedness to family and communities as well as increased employment are important outcomes and may have many benefits outside the health sector and may also affect family members' well-being.

Longer term follow-up with a larger sample size for the Women of Worth programme would need to be done to fully understand the impact of increased employment and self-determination on HIV and well-being of these young women and possibly also their families.

Evaluating the cost-effectiveness of the Women of Worth programme would need to assess the impact of sustained increase in employment for more than a year and increase in self-determination with potential impact on agency and autonomy beyond HIV in the individual recipient.

Costing studies of the Women of Worth empowerment programme would be valuable to assess cost-effectiveness and potential as an investment equivalent to an extra year of the CSG. However, costing evaluations often take on a narrow approach to costing and foreground health outcomes and do not account for other social determinants, costs and benefits.

In a recent review of considerations in cost evaluation for Public health interventions, only 3 in 10 studies undertook the evaluation from a social determinants focus.[422] A cost evaluation that has a social determinant lens and includes an impact on the family could potentially show the value of the Women of Worth empowerment programme beyond SRH/HIV outcomes. This could inform an investment case for the equivalent of less than one extra year of the CSG in South Africa in young women 19-24 years.

HIV safer sexual behaviours

This research showed mixed findings in the reduction of SRH/HIV risk related behaviours within a year of removing the cash-plus intervention. Why this was and what more could have been done needs further research that could include an objective evaluation of the knowledge and capacities attained by the participants and the impact these may have had on motivations and perceptions. Further research could explore cash-plus interventions and the influence on the choice of sexual partners and frequency of exposure of unsafe sexual practices. A longer follow up period with a larger sample size may show clearer results.

Minimising bias

Lastly, because self-reported measures may be an unreliable indication of actual behaviours due to recall and social desirability biases, future programmes could be strengthened by the inclusion of required HIV/STI testing pre- and post-intervention to validate self-reports. Linkages with the Provincial Department of Health database to validate HIV status and passively monitor changes in HIV status could be explored with stronger focus on ensuring alignment of data elements in the research database and the Provincial Department of Health database earlier in the research study.

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Appendix A: Letter of support from co-authors

To the UCT Doctoral Degrees Board

University of Cape Town

To whom it may concern

SUPPORT FROM CO-AUTHORS OF PUBLICATIONS INCLUDED IN THE PHD THESIS

We the signatories of this letter, confirm that we are co-authors of the paper titled "Women of Worth: the impact of a cash plus intervention to enhance attendance and reduce sexual health risks for young women in Cape Town, South Africa"

We hereby confirm that as per Rule 6.3 this published research paper is part of Tracey Naledi's original work for her PhD. Tracey Naledi conceived the presented research idea for the PhD with her Primary supervisor Prof Linda Gail Bekker (LGB). Tracey wrote the research protocol for the evaluation that was in addition to the broader proposal for the implementation of the Women of Worth written by LGB. Tracey Naledi developed the evaluation tools, performed fidelity testing and conducted in-interviews during implementation. She undertook data management and analysis; and wrote the published manuscript and the monograph presented here.

We the co-authors of the publication performed the following roles:

> **Professor Linda-Gail Bekker** provided guidance throughout the research that supported this research. Professor Linda-Gail Bekker and **Carey Pike** were instrumental in the development of the skills building empowerment manual and materials 'Women of Worth' used in this research. **Professor Leslie London** provided guidance on research methods, data analysis, interpretation and review of the manuscript. **Professor Francesca Little** provided technical guidance and reviewed of the statistical analysis of the data on the effectiveness of the CT on HIV vulnerability. **Harley Edwards and Colleen Wagner** project managed the Women of Worth programme and supervised the facilitators and reviewed the manuscript. **Dante Robbertze** for the training and mentoring the facilitators. For co-designing and undertaking the fidelity assessments and reviewing the manuscript

We trust that his meets your approval.

Regards

Name	Confirm (Yes/No)		Signature	Date of Signature
Professor Francesca Little	Yes	No		11/12/2022
Carey Pike	Yes	No		28/12/2022
Harley Edwards	Yes	No		12/12/2022
Colleen Wagner	Yes	No	C Wagner	12 Dec 2022
Dante Robbertze	Yes	No		12/12/2022
Professor Leslie London	Yes	No		24/12/22
Professor Linda-Gail Bekker	Yes	No		29/12/2022

Appendix B: Women of Worth published paper.

This document can be found using the following link below and is also appended at the end of this document.

Women of Worth: the impact of a cash plus intervention to enhance attendance and reduce sexual health risks for young women in Cape Town, South Africa

Appendix C: Women of Worth Empowerment Programme – Facilitator handbook

This 133-page document can be found using the following link:

Women of Worth Empowerment Programme - Facilitator Handbook

Appendix D: Women of Worth Participant Passport

This 17-page document can be found using the following link:

Women of Worth Participant Passport

Appendix E: Definition of variables

	Numerator	Denominator
Demographic indicators		
Gender: Female	Number of participants self-reporting female.	Total number of participants enrolled (by phase and randomisation arm)
Language: isiXhosa	Number of participants self-reporting isiXhosa as their home language	Total number of participants enrolled (by phase and randomisation arm)
Language: English/Afrikaans	Number of participants self-reporting English/Afrikaans as their home language	Total number of participants enrolled (by phase and randomisation arm)
Socio-economic indicators		
Completed High School	Number of participants self-reporting matric and any post matric qualification as their highest educational qualification	Total number of participants enrolled (by phase and randomisation arm)
Unemployed but Actively Seeking	Number of participants self-reporting being unemployed and actively seeking employment	Total number of participants enrolled (by phase and randomisation arm)
No income	Number of participants self-reporting receiving no income from any source.	Total number of participants enrolled (by phase and randomisation arm)
Financial assistance from Relatives or Social Grant	Number of participants self-reporting receiving financial support from relatives or social grants from government	Total number of participants enrolled (by phase and randomisation arm)

Financial assistance from intimate Partner	Number of participants self-reporting receiving financial support from intimate partners	Total number of participants enrolled (by phase and randomisation arm)
1day or more hungry per week	Number of participants self-reporting the number days going hungry because there was not enough food	Total number of participants enrolled (by phase and randomisation arm)
Lives in an informal home (shack)	Number of participants self-reporting a shack (an informal dwelling) as a type of home they stay in	Total number of participants enrolled (by phase and randomisation arm)
CV	Number of participants self-reporting to have a Curriculum Vitae (CV)	Total number of participants enrolled (by phase and randomisation arm)
Has Bank Account	Number of participants self-reporting to have a Bank Account	Total number of participants enrolled (by phase and randomisation arm)
Saving for the future	Number of participants self-reporting saving money for the future	Total number of participants enrolled (by phase and randomisation arm)
Volunteerism	Number of participants self-reporting volunteering in their community	Total number of participants enrolled (by phase and randomisation arm)
Relationship status: Cohabiting/married	Number of participants self-reporting their relationship status to be long term and living together or to be married	Total number of participants enrolled (by phase and randomisation arm)
Psycho-social Well being		
Happy/Content/Optimistic	Number of participants self-reporting feeling happy or very happy or content or	Total number of participants enrolled (by phase and randomisation arm)

	optimistic in the last 3 months	
Family very supportive	Number of participants self-reporting family to be very supportive when they have a problem	Total number of participants enrolled (by phase and randomisation arm)
Never drinks	Number of participants self-reporting to never drink alcohol in a normal week	Total number of participants enrolled (by phase and randomisation arm)
Alcohol drink 5 or more days per week	Number of participants self-reporting family to drink alcohol 5 or more days per week	Total number of participants enrolled (by phase and randomisation arm)
Binge Drinking	Number of participants self-reporting to drink 5 or more drinks in a typical day of drinking	Total number of participants enrolled (by phase and randomisation arm)
Using drugs in last 3 months	Number of participants self-reporting to have ever used recreational drugs (including marijuana, cocaine, tik)	Total number of participants enrolled (by phase and randomisation arm)
Sexual reproductive health behaviour Indicators		
Ever used contraception	Number of participants self-reporting to have ever used contraception.	Total number of participants enrolled (by phase and randomisation arm)
On contraception currently:	Number of participants self-reporting to be currently using contraception.	Total number of participants enrolled (by phase and randomisation arm)
Condom use at Last Sex	Number of participants self-reporting to have used condoms the last time they had sex	Total number of participants enrolled (by phase and randomisation arm)

Ever Pregnant	Number of participants self-reporting to have ever been pregnant	Total number of participants enrolled (by phase and randomisation arm)
STI Rx in last 6months	Number of participants self-reporting to have ever been treated for STI in the last 6 months	Total number of participants enrolled (by phase and randomisation arm)
High HIV Risk Perception	Number of participants self-reporting to think they are likely or are certain that they will get HIV in the next year	Total number of participants enrolled (by phase and randomisation arm)
Ever tested for HIV	Number of participants self-reporting to have tested for HIV in the last 6 months.	Total number of participants enrolled (by phase and randomisation arm)
Tested for HIV in last 6 months	Number of participants self-reporting to have ever tested for HIV.	Total number of participants enrolled (by phase and randomisation arm)
HIV Outcomes		
HIV Positive	Number of participants self-reporting to have ever tested HIV positive	Total number of participants who have ever tested for HIV (by phase and randomisation arm)
HIV Positive on ART	Number of HIV positive participants self-reporting to have ever tested HIV positive	Total number of participants enrolled (by phase and randomisation arm)
HIV Positive VL Suppressed	Number of HIV positive participants self-reporting to have ever tested HIV positive	Total number of participants who have ever tested for HIV (by phase and randomisation arm)
Structural Indicators		

GBV threat	Number of participants self-reporting that the current (or last) partner ever threatened to hurt or harm them or someone they care about	Total number of participants enrolled (by phase and randomisation arm)
Forced Sex ever	Number of participants self-reporting to ever been forced to have sex or preform sexual acts when you did not want to	Total number of participants enrolled (by phase and randomisation arm)
Transactional sex ever	Number of participants self-reporting to have ever felt like they had to have sex with a partner because they gave the participant money, drinks or other favours	Total number of participants enrolled (by phase and randomisation arm)
Overall health facility satisfaction	Number of participants self-rated the overall experience of the last visit they made to a health facility as good or very good.	Total number of participants enrolled (by phase and randomisation arm)
Dissatisfaction of Health Facility: Waiting time	Number of participants self-reporting to be difficult access to healthcare as a result of long waiting times	Total number of participants enrolled (by phase and randomisation arm)
Dissatisfaction of Health Facility: Travel	Number of participants self-reporting to be difficult access to healthcare as a result of travel distance	Total number of participants enrolled (by phase and randomisation arm)
Dissatisfaction of Health Facility: Unfriendly staff	Number of participants self-reporting to be difficult access to healthcare as a result of unfriendly or judgemental staff	Total number of participants enrolled (by phase and randomisation arm)

Appendix G: Fidelity Assessment Tool:

This 11-page document can be found using the following link:

Fidelity Assessment Tool

Appendix G: Quantitative survey questionnaire

Mixed methods study questionnaire

Name: _____

Date: dd/mm/yyyy __/__/____

Women of Worth empowerment programme graduation site: _____

Researcher available for assistance: _____

Thank you for agreeing to be part of this interview. We would like to know what it was like to attend the Women of Worth empowerment programme sessions and receiving or not receiving the cash transfer. I'd like you to be as honest as you can be because your input will be used to better understand the successes and challenges of this programme so that others who would like to implement it here or in other parts of the country or the world will learn from our experiences. I want to encourage you to share your thoughts. There is no correct or wrong answer and has been explained to you in the consent form, nothing you say here will prevent you from accessing any of the health services or mobile services.

Overall Experience of Women of Worth empowerment programme

1. What was your overall satisfaction with the WOMEN OF WORTH EMPOWERMENT PROGRAMME?

1	2	3	4	5	6	7	8	9	10

Very Dissatisfied Neutral Very Satisfied

2. Would you recommend the WOMEN OF WORTH EMPOWERMENT PROGRAMME to a friend?

1	2	3	4	5	6	7	8	9	10

Would NOT Recommend Neutral Would Recommend

3. Did you make friends with any of the other young women in your empowerment sessions?

☐ Yes

☐ No

☐ Choose not to answer

1. Do you plan on staying in touch with these friends?

☐ Yes

☐ No

4. What were the main reasons for attending the empowerment sessions? (Check all that apply)

☐ I found then very interesting and helpful

☐ I received a monetary incentive

☐ I really enjoyed the ignitor

☐ I had nothing better to do

☐ I had friends in my empowerment sessions

☐ Other (please specify):

_____

Incentive

5. Did you receive a cash transfer for attending the empowerment workshops? If NO, please answer question 12 and proceed to Question 18

☐ Yes

☐ No

1. If yes…, what did you use MOST of the money for?

☐ Savings

☐ Food

☐ Education (uniform, school supplies, transportation, etc.)

☐ Personal items (toiletries, clothes, shoes)

☐ Housing (rent)

☐ Communication (mobile phone, airtime, data)

☐ Other (please specify):

_____

6. Who MOSTLY decides how to spend your cash transfer from Women of Worth empowerment programme?

☐ You

☐ Your mother

☐ Your father

☐ Your partner

☐ Another family member

☐ Other (Please Specify) _____

7. Who MOSTLY withdraws your cash transfer from Women of Worth empowerment programme?

☐ You

☐ Your mother

☐ Your father

☐ Your partner

☐ Another family member

☐ Other (Please Specify) _____

8. Would you have continued attending the Women of Worth empowerment programme session even if you did not receive the money?

☐ Yes

☐ No

☐ Not sure

9. Did anyone try to take your money from Women of Worth empowerment programme by force?

☐ Yes

☐ No

☐ Not sure

1. If YES, what was their relationship to you.

☐ Your mother

☐ Your father

☐ Your partner

☐ Another family member

☐ Someone I do not know

☐ Other (Please Specify) _____

10. Did experience any violence (verbal or physical) because of you having the cash from Women of Worth empowerment programme?

☐ Yes

☐ No

☐ Not sure

1. If YES, what was their relationship to you.

☐ Your mother

☐ Your father

☐ Your partner

☐ Another family member

☐ Someone I do not know

☐ Other (Please Specify) _____

11. Did not getting the cash influence whether or not you attended the sessions?

☐ Yes

☐ No

☐ Not sure

Any Other Comments:

_____

_____

_____

_____

_____

_____

Appendix H: Qualitative survey focus group discussion guide.

Mixed Methods In-depth Interview Guide

Focus Group Discussion Guide

Name of Researcher: _____

Date: dd/mm/yyyy __/__/____

Women of Worth empowerment programme graduation site: _____

Language of FGD 1. English/Afrikaans/Xhosa/Other

Details of Participants: (N=___):

Sex Age

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Welcome and introduction: Welcome Thank you for agreeing to be part of this interview. We would like to know what it was like to attend the Women of Worth empowerment programme sessions and receiving or not receiving the cash transfer. I'd like you to be as honest as you can be because your input will be used to better understand the successes and challenges of this programme so that others who would like to implement it here or in other parts of the country or the world will learn from our experiences. I want to encourage you to share your thoughts. There is no correct or wrong answer and has been explained to you in the consent form, nothing you say here will prevent you from accessing any of the health services or mobile services.

For Group receiving Cash Transfer they would be asked:

1. What did you like the most about being in the Women of Worth empowerment programme trial?
2. What did you not like about being in the Women of Worth empowerment programme trial?
3. What was the best thing about receiving the cash transfer?
4. How did you decide to spend your money?
5. Who helps you decide how you spend your money?
6. What negative experiences if any have you had as a result of you receiving the cash transfer?
7. What positive experiences if any have you had as a result of you receiving the cash transfer?
8. What challenges did you experience in being part of the Women of Worth empowerment programme trial?
9. What would you change in the Women of Worth empowerment programme trial?

If participants were not receiving the cash transfer, they would be asked:

1. What did you like the most about being in the Women of Worth empowerment programme trial?
2. What did you not like about being in the Women of Worth empowerment programme trial?
3. How did you feel about not receiving the cash transfer from Women of Worth empowerment programme?
4. Did you have any challenges in the Women of Worth empowerment programme trial? If so, what were they?
5. What would you change in the Women of Worth empowerment programme trial?

JIAS JOURNAL OF THE INTERNATIONAL AIDS SOCIETY

RESEARCH ARTICLE

Women of Worth: the impact of a cash plus intervention to enhance attendance and reduce sexual health risks for young women in Cape Town, South Africa

Tracey Naledi[1,2,§], Francesca Little[3], Carey Pike[1], Harley Edwards[1], Dante Robbertze[1], Colleen Wagner[1], Leslie London[2] and Linda-Gail Bekker[1]

[§]**Corresponding author**: Tracey Naledi, Desmond Tutu HIV Centre, UCT Health Sciences Faculty, University of Cape Town, PO Box 13801, Mowbray 7705, South Africa. Tel: +27 21 650 5892. (tracey.naledi@uct.ac.za)

Abstract

Introduction: Conditional cash transfers (CTs) augmented with other interventions are promising interventions for reducing HIV risk in adolescent girls and young women.

Methods: A multi-phase, quasi-experimental study assessed the impact of a CT (ZAR300; $22) conditional on attending a skills building intervention, Women of Worth (WoW), designed to improve sexual and reproductive health (SRH) outcomes in Cape Town, South Africa from May 2017 to December 2019. The intervention entailed 12 sessions with encouragement to attend adolescent and youth-friendly health services. Women aged 19–24 years were randomized 1:1 to receive the intervention with a CT ("cash + care" or C+C) or without a CT ("care"). The study included a pilot phase followed by a post-modification phase with improved uptake and retention without changing programme content or CT. Self-reported HIV prevalence and SRH/HIV vulnerability were assessed via a self-administered questionnaire at baseline, after 11 sessions, and 6–30 months' post-intervention for a subset. Mixed effect logistic regression models were fitted to estimate within-subject changes in outcomes.

Results: Of 5116 participants, 904 (452 participants per arm) were in the pilot and 4212 (2039 "care" participants and 2173 "C+C" participants) were in the post modified phase. There were 1867 (85.9%) and 135 (6,6%) participants in the "C+C" group and the "Care," respectively, that were WoW completers (≥ 11 sessions/retention). During the pilot phase, 194 (42.9%) and 18 (4.0%) participants in "C+C" and the "care" groups were retained. Receiving a CT sustained participation nearly 60-fold (OR 60.37; 95% CI: 17.32; 210.50, p <0.001). Three-hundred and thirty women were followed for a median of 15.0 months [IQR: 13.3; 17.8] to assess the durability of impact. Self-reported new employment status increased more than three-fold (p <0.001) at WoW completion and was sustained to the longer time point. Intimate partner violence indicators were reduced immediately after WoW, but this was not durable.

Conclusions: Participants receiving CT had sustained participation in an SRH/HIV prevention skills building with improvement in employment and some SRH outcomes. Layered, "young woman centred" programmes to address HIV and SRH risk in young women may be enhanced with CT.

Keywords: conditional cash transfer; emerging adult women; HIV/AIDS; combination HIV interventions; young woman; youth

Additional information may be found under the Supporting Information tab of this article.

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1 | INTRODUCTION

Despite recent gains in HIV control in Eastern and Southern Africa (ESA), progress for adolescent girls and young women (AGYW) (15–24 years old) remains unacceptably slow and off-track to meet the UNAIDS 2030 goals [1]. The COVID-19 pandemic amplified the disproportionate burden of biological, social, economic and structural risk factors that drive HIV vulnerability in AGYW [2, 3]. AGYW aspirations for a successful transition into adulthood are hampered by HIV vulnerability, low high school completion, unemployment, unintended pregnancies, poor sexual reproductive health (SRH)/HIV knowledge and persistent gender inequalities [4]. In South Africa (SA), half the population live below the poverty line of R 992 ($70) per month and a third are dependent on social grants [5, 6]. Half of those who are not

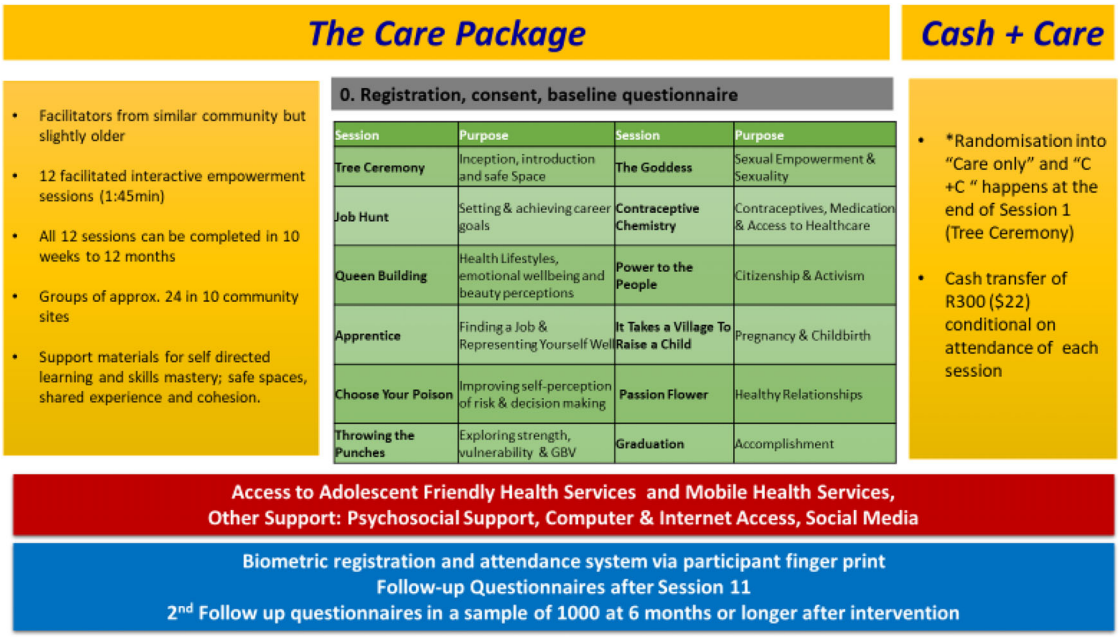

Figure 1. Women of Worth intervention schema.

in employment, education nor training are youth [6, 7]. The child support grant (CSG), a national unconditional cash transfer (CT) of R460 ($32) per month to children <18 years, has positively impacted childhood health outcomes and adolescent HIV vulnerability [8, 9]. Yet, the CSG ends at a time when increased financial susceptibility in young women can lead to transactional sex, inter-generational, unequal sexual power relationships and increased HIV risk [10, 11].

The complexity of HIV vulnerability in young women has led to calls for multi-deterministic approaches that combine behavioural and structural interventions delivered close to where they live [12–14]. These approaches aim to reduce individual, social and structural barriers to safe behaviours and enhanced access to services [15]. The effectiveness of CT alone on SRH/HIV outcomes in AGYW has been disappointing [16, 17] "Cash plus" interventions have been recommended as they augment CTs with life skills, behavioural interventions (BIs) and health systems strengthening that could promote protective SRH behaviours, as well as access to quality services [15, 16, 18–20]

A multi-phase, quasi-experimental study, Women of Worth (WoW), was conducted among 19- to 24-year-old women in Cape Town, SA as a component of an integrated, multi-component, multi-sector intervention for young people (aged 10–24 years) funded by the Global Fund for Malaria, HIV and TB [21]. We hypothesized that a CT conditional on the attendance of a modular SRH/HIV skills building programme and the simultaneous strengthening of adolescent and youth-friendly services (AYFS) at public facilities would lead to reduction in risk factors and result in favourable SRH/HIV outcomes in this population. We aimed to determine the baseline characteristics of HIV vulnerability among young women; quantify retention in the programme with and without a conditional CT; and measure changes in the prevalence of HIV- and SRH-related risk factors before and after exposure to the program.

2 | METHODS

2.1 | Study setting

The study was conducted across two sub-districts in Cape Town, SA, with a combined population of approximately 1 million living in formal and informal urban settlements. This setting is characterized by high levels of HIV, crime, violence and socio-economic deprivation [22, 23]. Most residents are isiXhosa or Afrikaans/English speaking. We implemented the intervention across 10 community venues within these sub-districts using near-peer community-recruited facilitators.

2.2 | Study population

Approximately 10,000 19- to 24-year-old women were recruited from the study area, regardless of HIV status. Inclusion criteria included residing in the study area and owning a mobile phone or having access to one. The latter facilitated CT payment. Recruitment was done through social media, word of mouth and community-based organizations.

2.3 | Intervention and study design

The WoW program was adapted from a pilot intervention, GirlPower, implemented in SA and Malawi between 2016 and 2017 [24]. The facilitator-led empowerment sessions addressed SRH/HIV knowledge, self-esteem, healthy relationships, financial and health literacy (SRH/HIV, mental health and gender-based violence [GBV]), job-seeking skills and active citizenry [24]. Figure 1 shows the WoW "care" interventions that included (1) 12 facilitator-led, group skills build-

ing sessions to address a range of SRH/HIV determinants, (2) support services, including psychosocial services and (3) fixed (government) and mobile (non-governmental) YFHS with the promotion of HIV testing, contraception services, antiretroviral treatment and HIV pre-exposure prophylaxis referral. The "care plus cash" (C+C) arm included this "care" package plus a CT of R300 ($22) paid after attendance at each session. Upon initiation, participants received a WoW T-shirt, bag, water bottle and WoW materials. A light snack was offered after each session and graduation included a certificate and a meal.

We used a multi-phase, quasi-experimental mixed-methods study design. Participants registered on-site by self-selection on a first-come, first-served basis by providing electronic informed consent and self-administering an SRH/HIV risk assessment questionnaire. Questionnaires were conducted at baseline (registration) and following the 11th session.

In the initial randomized control trial (RCT) phase, approximately 5000 participants were randomized 1:1 to "care" arm versus "C+C" arm. After enrolling approximately 1000 participants in the pilot phase, low participant retention prompted a study pause between December 2017 and March 2018. The RE-AIM approach was used to review the program and distil modifications solicited from staff and participant consultations shown in Table S1 [25]. Improvements applied to both study arms included implementation support and changing from fixed monthly sessions to weekly flexible attendance, such that sessions could be attended in any order prior to the 12th session (graduation). Programme content and CT remained unchanged. Facilitators underwent regular training, with unannounced fidelity assessments conducted on site. Participants already enrolled in the pilot phase continued in the modified programme. To determine the durability of effect, we invited participants who attended at least one session with post-exposure time of between 6 and 30 months (total project months) to repeat the baseline questionnaire. We offered a R50 ($3,44) reimbursement on a first-come, first-served basis to a maximum of 1000 participants for this follow-up visit. After the randomized phase, an open label phase enrolled approximately 5000 participants and only offered "care and cash."

2.4 | Data collection and management

Self-administered questionnaire data and session attendance were collected on a digital tablet using a fingerprint-enabled biometric information system. After registration, participants were assigned a unique participant identification number (PID). PIDs were randomly assigned to a study arm following a biometric check-in and out at the first session. A message indicating arm assignment was automatically sent to participant's mobile phone. A digital voucher was sent after each session attendance via mobile phone to those randomized to the "C+C" arm. Participants in the "care" arm received a message of encouragement but no voucher.

2.5 | Study outcomes and analytical methods

The primary outcome of self-reported changes in HIV prevalence and secondary outcomes of self-reported SRH/HIV-related risk factors were measured after exposure to the skills building sessions during the RCT study phase. We compared baseline risk factors by study arm to assess whether randomization ensured comparable HIV vulnerability by testing differences between groups using chi-square statistics with a $p \leq 0.05$ threshold for statistical significance. As a measure of retention, WoW completers were defined as those who completed at least 11 sessions. We fitted logistic regression models with subject-specific random for mixed effects, to estimate the intra-individual change estimates of effect. We measured changes in self-reported HIV, behavioural and structural SRH risks from baseline to (1) end of WoW and (2) at follow up (6–30 months post-exposure) irrespective of WoW completion. Observations in the models included subjects at baseline and at these outer time points. Maximum-likelihood estimation of the model parameters ensured unbiased estimates despite loss to follow up (LTFU) under the missing-at-random assumption. However, to mitigate potential bias due to unmeasured confounders or predictors of LTFU in the "care" arm, we analysed change in outcomes not disaggregated by study arm. Models included the number of visits attended to measure intervention dose. Models were adjusted for confounding variables that were (1) statistically different at baseline between the study arms and (2) baseline variables that were associated with LTFU at the end of WoW and at follow up (Table S2). All analyses were conducted using STATA 15 [26].

2.6 | Ethics

The study design was discussed with community stakeholders and a local Community Advisory Board before protocol review. Due to concerns raised by community members, CTs were not conditional on uptake of health services but rather incentivized attendance at skills building sessions. Ethics approval was received from the University of Cape Town Human Research Ethics Committee (HREC) HREC 033/2017 and HREC 716/2018. The trial is registered with BMC Trials ISRCTN25016009 https://doi.org/10.1186/ISRCTN25016009.

3 | RESULTS

3.1 | Programme uptake

Program participation is shown in Figure 2 with 11,494 participants registered and 83.6% (9995) successfully initiating the WoW program by attending at least one session. Complete records of 8765 (87.8%) initiators were usable and analysed. Only 904 and 4212 participants in the randomized pilot phase and post modification phases, respectively, are included here.

3.2 | Baseline socio-economic and structural vulnerabilities to HIV

Table 1 shows the comparable baseline characteristics of participants by study arm. Participants' median age was 21.5 years IQR [20.2; 22.9]. Only 2391 (46.7%) completed high school and most 3724 (72.8%) were unemployed but actively seeking work. Half 2583 (50.5%) had no income with reported dependence on relatives and social grants and lim-

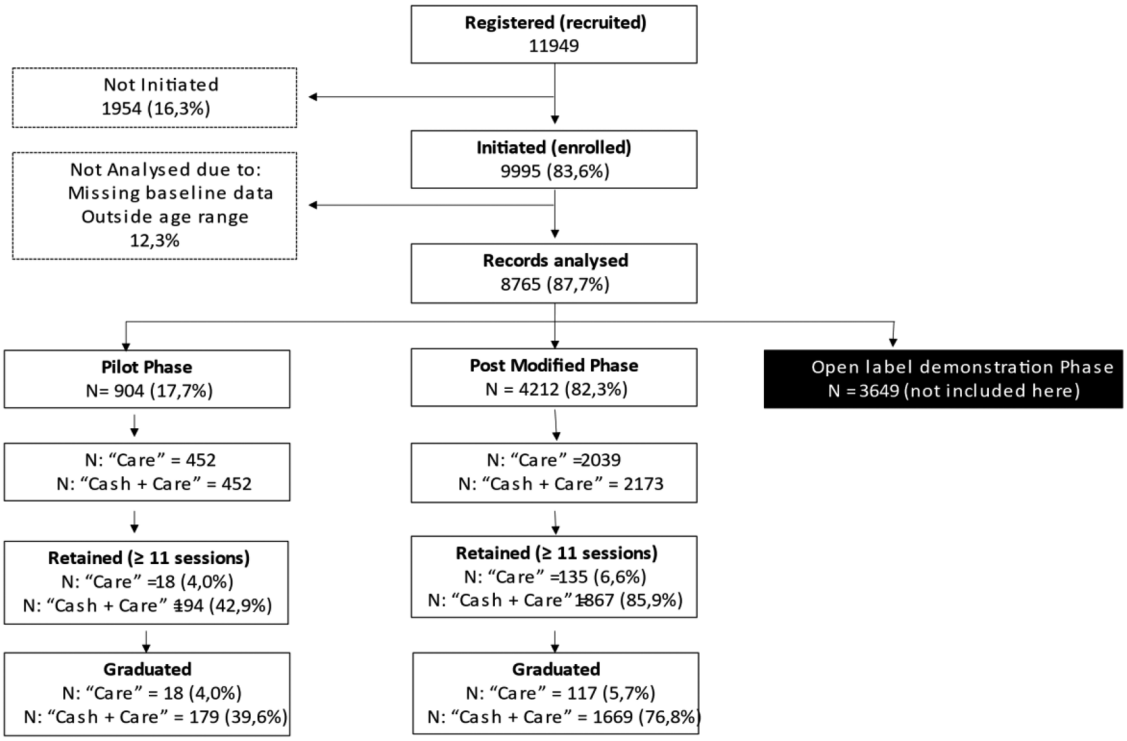

Figure 2. Consort diagram of recruitment, enrolment and retention in the WoW programme (RCT only).

ited financial assistance from intimate partners. Despite high reported contraception usage, only 2068 (40.4%) reported condom use at last sex and nearly half (2361; 46.1%) the cohort reported a previous pregnancy and 1135 (22.2%) individuals received treatment for a sexually transmitted infection (STI) in the last 6 months. Although one third of individuals reported low HIV risk perception, almost all participants had undergone voluntary HIV testing in the last 6 months. Two-thirds of those who were HIV positive reported to be on antiretroviral treatment, but viral load suppression was less than 20%. Gender-based threats or violence by the current or last partner was experienced by one in five participants and 675 (13.2%) reported ever experiencing forced sex. Overall health facility satisfaction was relatively high at 3152 (61.6%). Most participants still reported dissatisfaction with long waiting times, travel distances and unfriendly staff. Because of programme modifications, the cohorts from the pilot and post modification were compared at baseline. The two cohorts were similar except the post modification cohort had a lower socio-economic profile and lower reported HIV prevalence (5.1%) versus those in the pilot phase (8.2%).

3.3 | Program retention by arm and study phase

Two thousand and two hundred and fourteen (43.3%) completed the programme, with significant differences in retention between study arms and phases (Figure 2). Of "C+C" participants enrolled in the modified programme, 1867 (85.9%) were WoW completers and 1669 (76.8%) continued to graduation. Of those enrolled in the pilot phase, only 194 (42.9%) participants in the "C+C" arm were WoW completers and 179 (39.6%) graduated. Overall, 1848 (78.5%) participants in the "C+C" arm were retained. In contrast, participants randomized to "care" in all study phases were poorly retained with a steep reduction at the end of the first session after randomization was applied (Figure 3). Following modification, in the "care" arm, only 135 (6.6%) participants were WoW completers and 117 (5.7%) graduated. Similarly, in the pilot phase "care" arm, 18 (4.0%) participants completed 11 sessions and 11 graduated. Compared with "care" arm participants, "C+C" arm participants were 60 times more likely to be WoW completers (OR 60.37; 95% CI: 17.32; 210.50, p <0.001). We saw a 23-fold improvement in retention of participants in the post modification phase (OR 22.91; 95% CI: 1.07; 516.39; p = 0.049) versus the pilot phase. Baseline variables associated with LTFU (Table S2a and S2b) and those that had a statistically significant association with LTFU at the end of WoW (completers vs. non-completers) and at median 15 months (followed up vs. not followed up) were used to adjust the models discussed below.

3.4 | SRH outcomes by arm

Of the 2214 "WoW completers," 1149 (51.9%) completed questionnaires after 11 sessions: 1005 "C+C" and 144 "care." Overall, the "C+C" and "care" groups completed the programme in a similar duration of median 15 weeks (IQR: 12 weeks) and 14 weeks (IQR: 12 weeks), respectively. The post modification phase had a similar completion time between arms of median 14 weeks with a shorter IQR of 7 weeks. Participants who enrolled during the pilot phase had a longer completion time of median 46 weeks (IQR: 33 weeks).

Table 1. Baseline socio-economic and structural vulnerabilities to HIV by study arm and study phase

	Pilot (N = 904)					Post modification (N= 4212)					All phases randomized (N = 5116)					All phases, all arms (N = 5116)					
	Care only N = 452		C+C	N = 452	p value	Care only N = 2039		C +C	N = 2173	p value	Care only N = 2491		C+ C	N = 2625	p value	Pilot	N = 904	Post modification N = 4212		Total N = 5116	p value
MeanAge [95% CI	21.0	(18.6; 24.7)	21.0	(18,7; 24.7)		21.0	(18.6; 24.9)	21.0	(18.5; 24.9)		21.0	(18.6; 24.9)	21.0	(18.5; 24.9)		21.0	(18.6; 24.7)	21.0	(18.6; 24.7)21	(18.5; 24.7)	
Gender: Female	444	98.2%	437	96.7%	*0.139*	2037	99.9%	2166	99.7%	*0.116*	2481	99.6%	2603	99.2%	*0.048*	881	97.5%	4203	99.8%	5084	99.4%	<0.001
Language: isiXhosa	343	75.9%	342	75.7%	*0.938*	1726	84.7%	1875	86.3%	*0.132*	2069	83.1%	2217	84.5%	*0.175*	685	75.8%	3601	85.5%	4286	83.8%	<0.001
Socio-economic determinant indicators																						
Completed high school	215	47.6%	195	43.1%	*0.181*	949	46.5%	1032	47.5%	*0.537*	1164	46.7%	1227	46.7%	*0.992*	410	45.4%	1981	47.0%	2391	46.7%	0.359
Unemployed but actively seeking	346	76.6%	344	76.1%	*0.876*	1482	72.7%	1552	71.4%	*0.362*	1828	73.4%	1896	72.8%	*0.353*	690	76.3%	3034	72.0%	3724	72.8%	0.008
No income	186	41.2%	168	37.2%	*0.220*	1115	54.7%	1114	51.3%	*0.026*	1301	52.2%	1282	48.8%	*0.015*	354	39.2%	2229	52.5%	2583	50.5%	<0.001
Financial assistance from social grant	93	20.6%	124	27.4%	*0.016*	425	20.8%	490	22.6%	*0.180*	518	20.8%	614	23.4%	*0.025*	217	24.0%	915	21.7%	1132	22.1%	*0.134*
Financial assistance from intimate partner	17	3.8%	21	4.7%	*0.507*	88	4.3%	93	4.3%	*0.954*	105	4.2%	114	4.3%	*0.822*	38	4.2%	219	4.3%	257	5.0%	*0.900*
Relationship status: cohabiting/married	53	11.7%	45	10.0%	*0.392*	117	5.7%	142	6.5%	*0.282*	170	6.8%	187	7.1%	*0.675*	98	10.8%	259	6.2%	357	7.0%	<0.001
Psychosocial wellbeing determinants indicator																						
Happy/content/optimistic	337	74.6%	332	73.5%	*0.705*	1228	60.2%	1238	57.0%	*0.032*	1565	62.8%	1570	59.8%	*0.027*	669	74.0%	2466	58.5%	3135	61.3%	<0.001
Family very supportive	321	71.0%	317	70.1%	*0.770*	968	47.5%	1015	46.7%	*0.619*	1289	51.8%	1332	50.8%	*0.473*	638	70.6%	1983	47.1%	2621	51.2%	<0.001
Alc drink 5 or more days per week	38	8.4%	36	8.0%	*0.808*	158	7.8%	182	8.4%	*0.456*	196	7.9%	218	8.3%	*0.567*	74	8.2%	340	8.1%	414	8.1%	0.909
Using drugs in the last 3 months	22	4.9%	20	4.4%	*0.752*	103	5.1%	125	5.8%	*0.315*	125	5.0%	145	5.3%	*0.419*	42	4.7%	228	5.4%	270	5.3%	0.349
Sexual Reproductive Health (SRH) behavioural Indicators																						
Ever tested for HIV	404	89.4%	421	93.1%	*0.045*	1879	92.2%	2023	93.1%	*0.241*	2283	91.7%	2444	93.1%	*0.050*	825	91.3%	3902	92.6%	4727	92.4%	0.156
HIV test in the last 6 months (378 missing records)	302/405	74.6%	331/422	78.4%	*0.189*	1549/1884	82.2%	1661/2027	81.9%	*0.823*	1851/2289	80.9%	1992/3843	81.3%	*0.677*	633/827	76.5%	3210/3911	82.1%	3843	81.1%	<0.001
Condom use at last sex	164	36.3%	162	35.8%	*0.890*	845	41.4%	897	41.3%	*0.915*	1009	50.5%	1059	40.3%	*0.905*	326	36.1%	1742	41.4%	2068	40.4%	0.003
STI Rx in the last 6 months	90	19.9%	98	21.7%	*0.512*	478	23.4%	469	21.6%	*0.148*	568	22.8%	567	21.6%	*0.301*	188	20.8%	947	22.5%	1135	22.2%	0.268
High HIV risk perception	141	31.2%	169	37.4%	*0.050*	724	35.5%	721	34.3%	*0.112*	865	34.7%	890	33.9%	*0.537*	310	34.3%	1445	34.3%	1755	34.3%	0.993
Ever used contraception	313	69.3%	316	69.9%	*0.828*	1447	71.0%	1563	71.9%	*0.490*	1760	70.7%	1879	71.6%	*0.465*	629	69.6%	3010	71.5%	3639	71.1%	0.257
On contraception currently:	281	62.2%	290	64.2%	*0.535*	1313	64.4%	1449	66.7%	*0.118*	1594	64.0%	1739	66.3%	*0.09*	571	63.2%	2762	65.2%	3333	65.1%	0.168
Ever pregnant	216	47.8%	217	48.0%	*0.947*	927	45.5%	1001	46.1%	*0.695*	1143	45.9%	1218	46.4%	*0.712*	433	47.9%	1928	45.2%	2361	46.1%	0.245
HIV outcome indicators																						
HIV positive	37	8.2%	37	8.2%	*1.000*	102	5.0%	114	5.3%	*0.720*	139	5.6%	151	5.8%	*0.790*	74	8.2%	216	5.3%	290	5.7%	<0.001
HIV positive on ART	21/37	56.8%	22/37	59.5%	*0.814*	69/102	67.7%	75/114	65.8%	*0.772*	90/139	64.8%	97/151	64.5%	*0.928*	43/74	58.1%	144/216	66.7%	187	64.5%	0.184
HIV-positive VL suppressed	7/37	18.9%	4/37	10.8%	*0.327*	21/102	20.6%	20/114	17.5%	*0.569*	28/139	20.1%	24/151	15.9%	*0.346*	11/74	14.9%	41/216	19.0%	52	17.9%	0.426
Structural determinants Indicators																						
GBV threat	65	14.4%	71	15.7%	*0.577*	426	20.9%	476	21.9%	*0.423*	491	19.7%	547	20.8%	*0.316*	136	15.0%	902	21.4%	1038	20.3%	<0.001
Forced sex ever	36	8.0%	46	10.2%	*0.247*	278	13.6%	315	14.5%	*0.422*	314	12.6%	361	13.8%	*0.226*	82	9.1%	593	14.1%	675	13.2%	<0.001
Transactional sex ever	29	6.4%	19	4.2%	*0.138*	359	17.6%	353	16.2%	*0.239*	388	15.6%	372	14.2%	*0.158*	48	5.3%	712	16.9%	760	14.9%	<0.002
Overall health facility satisfaction	299	66.2%	303	67.0%	*0.778*	1246	61.1%	1304	60.0%	*0.466*	1645	62.0%	1607	61.2%	*0.554*	602	66.6%	2550	60.5%	3152	61.6%	0.001
Dissatisfaction: waiting time	276	61.1%	261	57.7%	*0.770*	1129	55.4%	1147	52.8%	*0.305*	1405	56.4%	1408	53.6%	*0.185*	537	59.4%	2276	54.0%	2813	55.0%	
Dissatisfaction: unfriendly staff	53	11.7%	57	12.6%		339	16.6%	390	18.0%		392	15.7%	447	17.0%		110	12.2%	729	17.3%	839	16.4%	
Dissatisfaction: travel	83	18.4%	88	19.5%		349	17.1%	374	17.2%		432	17.3%	462	17.6%		171	18.9%	723	17.2%	894	17.5%	<0.001

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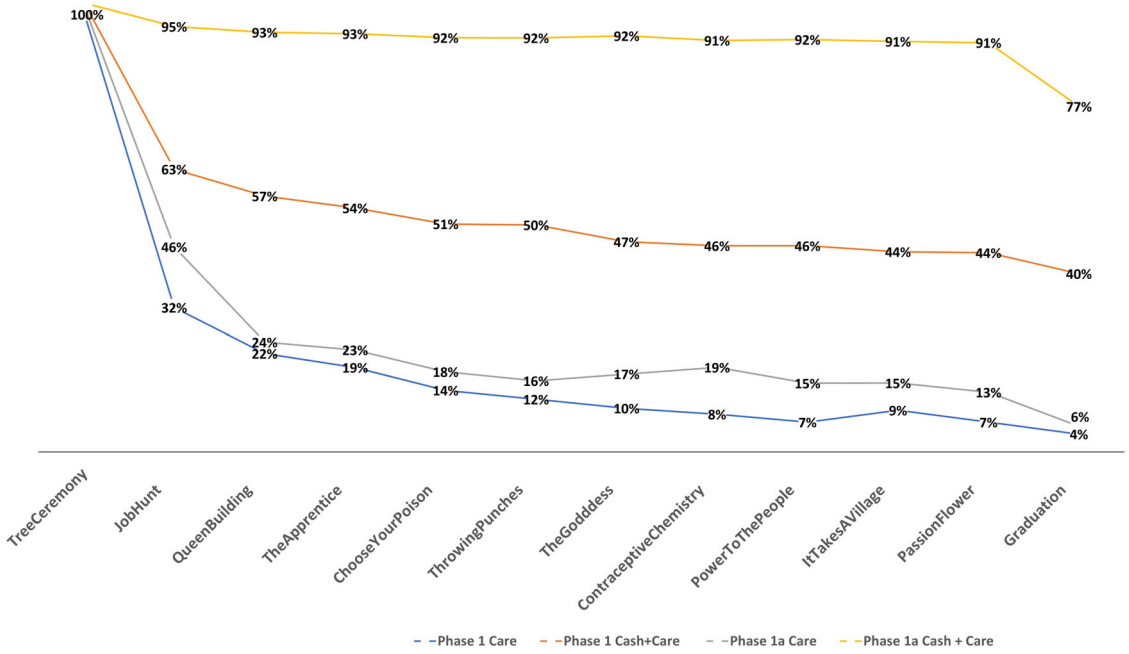

Figure 3. Retention in the Women of Worth programme by study arm and study phase.

Adjusted changes in self-reported SRH behavioural and structural risk factors immediately after WoW with both study arms combined are shown in Table 2. Compared to baseline, changes in self-reported structural risk factors at the end of WoW were consistent. The odds of self-reporting current employment status increased more than three-fold (p <0.001) and self-reporting facility satisfaction increased 45% (p <0.001). The odds of self-reporting GBV threat, forced sex and transactional sex were reduced by 47% (p <0.001), 63% (p <0. 001) and 50% (p <0.001), respectively.

The changes on SRH behavioural risk factors were mixed. The odds of self-reporting uptake of contraception and STI treatment increased by 62% (p < 0.001) and 50% (p< 0.001), respectively, at the end of WoW compared to baseline. However, comparing the same period, the odds of self-reporting HIV testing in the last 6 months, condom use at last sex and recognition of HIV risk perception were reduced by 75% (p <0.001), 51% (p< 0.001) and 95% (p < 0.001), respectively. In addition to the 290 participants who self-reported HIV positivity at baseline, 42 participants at the end of WoW and seven participants at follow up self-reported HIV positivity for the first time. These numbers were insufficient to model and assess new HIV infection.

3.5 | Durability of impact of the WoW program

There were 330 participants (132 "care" and 198 "C+C") of the 1000 participants invited to test for durability of effect and the dose response of the skills building sessions who were in the randomized phases of the study. They had follow-up time of median 15.0 months [IQR: 13.3; 17.8] post-intervention. In this group, 206 (62.4%) attended ≥9 sessions and 102 (30.9%) ≤ 3 sessions. At this time point, the odds of self-reported current employment status showed durability and were increased 2.5-fold (p <0.001) compared to baseline (Table 2). There was no discernible dose response.

4 | DISCUSSION

Receipt of a modest CT increased young women's sustained participation in the WoW SRH skills building programme by 60-fold. Finding and holding participant attention in such programs, especially in the context of competing priorities, is difficult. Young women who have recently completed secondary school are highly transient and difficult to retain, as illustrated by the limited number who could be located for long-term follow up. Yet, SRH impact depends on sufficient session exposure, making session attendance critical [26–28]. Mechanistically, conditional CT may provide a means to capture and hold participants' attention and so support sustained engagement and increased exposure to session content [16]. The benefit of the WoW program alone remains underdetermined, as attendance in the "care" only arm was very low. However, after controlling for cofounders in those retained, current employment status increased more than three-fold immediately after WoW, and this was durable post-intervention.

Baseline characteristics demonstrated low socio-economic profiles with high rates of unemployment and HIV prevalence and risk behaviours, similar to population characteristics in the study areas [29]. Youth constitute a large proportion of the unemployed in Africa, making them harder to reach and retain in interventions due to competing demands of job seeking [30, 31]. The incongruent, poor HIV risk perception, is a significant predictor for the adoption of health-promoting behaviour. In our participants this may result from

Table 2. Impact of WoW on intra-subject self-reported behavioural and structural risk factors for HIV vulnerability in women who completed the WoW program and those followed up at median 15 months

At the end of WoW (N = 1149)[a,b]	OR	95% CI		p Value
HIV test in the last 6 months	0.25	0.20	0.31	<0.001
Condom use at last sex	0.49	0.40	0.60	<0.001
High HIV risk perception	0.05	0.03	0.08	<0.001
Current contraception	1.62	1.29	2.03	<0.001
Treated STI in the last 6 months	1.50	1.21	1.85	<0.001
GBV threat	0.53	0.41	0.69	<0.001
Forced sex	0.37	0.27	0.52	<0.001
Transactional sex	0.50	0.37	0.66	<0.001
Employed	3.34	2.22	5.04	<0.001
Facility satisfaction	1.45	1.20	1.75	<0.001
At follow up (N = 330)[c,d]	**OR**	**95% CI**		***p* value**
HIV test in the last 6 months	0.70	0.12	4.15	0.696
Condom use at last sex	0.91	0.98	1.02	0.593
High HIV risk perception	0.89	0.71	1.13	0.350
Current contraception	1.00	0.77	1.29	0.973
Treated STI in the last 6 months	1.09	0.99	1.34	0.432
GBV threat	0.99	0.76	1.30	0.964
Forced sex	0.75	0.50	1.11	0.152
Transactional sex	0.83	0.63	1.10	0.200
Employed	2.47	1.69	3.59	< 0.001
Facility satisfaction	0.90	0.72	1.12	0.373

[a]Adjusted for session attendance, study phase, language:isiXhosa, happiness and family support.
[b]Observations include responses at baseline (N = 5116) and at the end of WoW (N = 1149).
[c]Adjusted for session attendance, study phase, language:isiXhosa, high school completion, family support, HV testing in the last 6 months and transactional sex.
[d]Observations include responses at baseline (N = 5116) and at median 15 months (N = 330).

HIV being deprioritized in their overall context, as there is evidence that poverty-related stressors, such as unemployment, low education and community violence, may override stressors or risk perceptions related to HIV/AIDS [32]. The high LTFU in the "care" group suggests that rewarding attendance, even modestly, may be necessary to "nudge" individuals to engage. This maximizes their exposure to developmental interventions, which, when combined with structural and BIs, have potential to reduce HIV vulnerability [16].

Curbing unemployment addresses a structural determinant of HIV vulnerability in AGYW and a sustainable development priority [32, 33]. Unemployment at baseline was high in all groups even in those LTFU. This makes the generalizability of the finding of increased employment to poor, urban, out-of-school, young women in Cape Town plausible. In SA, unemployment increased in young people of a similar socioeconomic profile during the study period, further suggesting credibility of our findings [34]. However, as employment was self-reported, social desirability and other unmeasured confounders may have biased these results. However, as two of the 12 WoW sessions addressed job seeking, WoW may have directly improved their skills and competence. Participants were provided with computer and internet access as well as assistance in CV development and job applications. That the effect of these interventions was durable for more than a year after exposure is encouraging albeit based on a small sample size.

Our findings on behavioural risk factors were mixed. WoW showed promise in the short term by increasing individuals' uptake of contraception and STI treatment, while condom use and recognition of HIV risk remained unchanged. SRH behaviour change in AGYW is complex, and patriarchal power dynamics frame perceptions, norms and SRH behaviours and influence HIV vulnerability [35, 36]. CT studies in AGYW in SA and Tanzania have shown reductions in risky sexual behaviours by using financial resources to improve bargaining power in sexual relationships and reducing the number of sexual partners [37, 38]. A review of CT effectiveness on GBV found mixed results, although augmentation with "gender transformative" and skills building interventions improved outcomes [39, 40]. This corroborates with WoW program results, which included a GBV component.

Evidence for the effectiveness of financial incentives to impact health behaviours, such as medication adherence, linkage and retention in care, has so far shown mild, unstained outcomes [41–43]. CTs augmented with human

development and "supply-side" interventions may be more effective as they increase individual and institutional resources and capacities for demand creation and service quality [44]. Even though no incentives were given in WoW to directly motivate services access; the attention to overall quality improvement and promotion of AYFS health services during sessions may have partially addressed "supply issues" that could have influenced contraception and STI treatment uptake [45, 46]. Increased facility satisfaction suggested that AFYS may have impacted service quality, although this effect was not durable showing the difficulty of sustaining health service improvements.

CTs with augmented HIV interventions in African AGYW have shown potential to lower HSV-2, reduce HIV incidence to various degrees, reduce transactional sex and reduce HIV risk behaviours [24, 47–51]. Within these programmes, CTs have been strongly associated with attendance and/or adherence with the study intervention [24, 50, 52]. WoW demonstrated the value of a "young woman centred" that uses a CT to ensure program participation while addressing transitional AGYW needs. These findings add to the emerging evidence in support of multi-component "layered" interventions to reduce HIV vulnerability in AGYW in Africa [24, 27, 50]. The durability of some WoW outcomes 15 months post intervention suggests an effect in the absence of any further reward.

The appropriate size of the CT is determined by the objectives of the intervention; however, the World Bank has found that CT in ESA needs to provide >20% of household consumption to have a significant impact on health and development [53]. Baird and colleagues did not show improved health outcomes with small increases in CT to AGYW in Malawi [54]. The CT given to WoW participants was about 33% less than the value of the national CSG for 1 year and 30% of the national poverty line [5]. This suggests that modest CTs are more likely a "nudge" than a livelihood. In the context of HIV prevention, this intervention could be regarded as high cost; however, the cost-effectiveness, which includes a sustained increase in employment that could impact beyond HIV, is undetermined.

This study used self-reported measures, which may provide unreliable indications of actual behaviours due to recall and social desirability biases. Participants could report different HIV status results at each follow-up visit potentially biasing the direction of the results. HIV-positive results were, however, retained for all visits regardless of subsequent responses. Mitigation of the LTFU limitations by linking study records with provincial HIV records was unsuccessful. HIV status reliability in this and future programmes could be strengthened by the inclusion of obligatory HIV/STI testing pre and post intervention to validate self-reports, though this limits voluntary uptake of testing. The lack of sustained participation in the "care" arm was the greatest confounder and impacted study power and effect sizes. Lack of durability data is a limitation in CT studies, thus, our follow-up data provide important insights [50, 55, 56]. However, caution should be exercised due to the small sample size. Qualitative studies to gain participant insights on this and the role of the cash incentives in their lives are underway to inform potential effect pathways.

5 | CONCLUSIONS

A modest CT conditional on attendance of a modular SRH/HIV prevention skills building programme was necessary to incentivize and sustain participation of urban out of school young women in SA. Sustained participation resulted in increased current employment status and moderate improvement of some SRH aspects short term. Uptake and attendance in layered, "young woman centred" developmental programmes to address outcomes of HIV and SRH in young women may be enhanced with modest CT.

AUTHORS' AFFILIATIONS

[1]Desmond Tutu HIV Centre, UCT Health Sciences Faculty, University of Cape Town, Cape Town, South Africa; [2]Division of Public Health Medicine, University of Cape Town, Cape Town, South Africa; [3]Department of Statistical Sciences, University of Cape Town, Cape Town, South Africa

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COMPETING INTERESTS

There are no competing interests.

AUTHORS' CONTRIBUTIONS

TN conceived of the presented idea with LGB, performed fidelity testing and interviews, and undertook the data management, analysis and wrote the manuscript. FL provided technical guidance and review of the statistical analysis. CP helped develop the skills building manual and program, developed materials and reviewed the manuscript. HE managed the research team and reviewed the manuscript. DR trained facilitators, performed fidelity testing and interviews, and reviewed the manuscript. CW managed the research team and reviewed the manuscript. LL reviewed data analysis and interpretation of the manuscript. LGB conceived of the study design, helped to develop the skills building manual and program and materials, supervised the entire research process, including data analysis and interpretation, and reviewed the manuscript.

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DATA AVAILABILITY STATEMENT

The authors confirm that the data supporting the findings of this study are available.

DISCLAIMER

Nothing to report.

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SUPPORTING INFORMATION

Additional information may be found under the Supporting Information tab for this article:

Table S1: Intervention optimization defined by RE-AIM Criteria

Table S2a: Baseline characteristics that are different in WoW completers compared to non-completers

Table S2b: Baseline characteristics that are different in those at follow-up compared to those not at follow-up