

**UNIVERSITY OF
PLYMOUTH**

**EVIDENCE BASED STRATEGIES TO ESTABLISH
POPULATION-BASED CERVICAL CANCER
SCREENING IN KIRKUK, IRAQ**

by

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ABSTRACT

Evidence based strategies to establish population-based cervical cancer screening in Kirkuk, Iraq

Suhailah Ali

Background: Cervical cancer may be fatal to women if not identified and treated early. In Iraq, cervical cancer ranks as the 10th most frequent cancer among women between 15-44 years of age, with about 291 new cervical cancer cases diagnosed annually. Cervical cancer can be prevented in two ways: primary prevention aimed at preventing HPV infection through prophylactic HPV vaccinations; and secondary prevention aimed at preventing precancerous lesions from progressing into invasive lesions through screening. Cervical cancer screening is under researched in Iraq. It is clear that Iraq's years of isolation and disorder has resulted in a loss of research capacity.

Aim: To provide evidence-based strategies to establish population based cervical cancer screening services in Iraq.

Methods: A mixed methods sequential exploratory design was used; an iterative mixed method approach which included the triangulation of qualitative, quantitative and systematic review methods. Results of all phases were used to develop an emergent theory around the barriers for establishing cervical screening programme and to provide evidence to enhance cervical cancer screening services to be established in Iraq.

Findings: The findings from the systematic review indicated significant health inequalities for Arab Muslim women, in that no population-based cervical cancer screening programmes have been implemented in most of Western Asian and Middle Eastern Arab countries. Findings from the qualitative phase revealed gap in theoretical and practical knowledge among the health care professionals regarding cervical cancer screening programmes with a lack of the capacity and infrastructure to establish population based cervical screening programme in Kirkuk, Iraq. Also, results suggest that the health behaviour of women living in Kirkuk is influenced by cultural 'stigma' around the word 'cancer', in addition to women's lack of awareness in relation to smear test and cervical screening.

Conclusion: Women in Iraq are more likely to be diagnosed at an advanced, rather than early stage of cervical cancer. These women should be targeted by cervical cancer screening and health education programmes. Policy makers need to improve the cervical screening infrastructure and make the cervical screening service more accessible to women. The current opportunistic cervical screening services are insufficient; there is an urgent need to developing cervical cancer intervention programmes.

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List of abbreviations

AGUS	Atypical glandular cells
AMW	Arab Muslim Women
ASC	Atypical squamous cell
ASCUS	Atypical squamous cells of undetermined significance
ASIR	Age standardised incidence rate
ASMR	Age standardised mortality rate
BCU	Birmingham City University
CC	Cervical cancer
CCS	Cervical cancer screening
CIN	Cervical intraepithelial neoplasia
CIN1	Mild intraepithelial neoplasia
CIN2	Moderate intraepithelial neoplasia
CIN3	Sever intraepithelial neoplasia
HPV	<i>Human papillomavirus</i>
HRHPV	High risk <i>Human papillomavirus</i>
HSILs	High grade squamous intraepithelial lesions
IUD	Intrauterine devices
LBC	Liquid Based Cytology
LSIL	Low grade Squamous intraepithelial lesions
NCCP	National cancer screening programme
NHS	National Health Service
NHSCSP	National Health Service Cervical Screening programme
PID	Pelvic inflammatory disease
QA	Quality Assurance
SCC	Squamous cell carcinoma
SIL	Squamous intraepithelial lesions
STDs	Sexual transmitted disease
VIA	Visual inspection of the cervix with acetic acid
WAMEMs	Western Asia and Middle East Muslim countries

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Chapter one

Introduction and background

1.1 Statement of the problem

Cervical cancer may be fatal to women if not identified and treated early (Aminisani *et al.*, 2012). In Iraq, cervical cancer ranks as the 12th most frequent cancer among women overall and the 10th most frequent cancer in women between 15-44 years of age, with about 291 new cervical cancer cases diagnosed annually (Figure 1-1) (Bruni L *et al.*, 2016). It is argued that this is because preventative cancer care is less accessible in many Asian countries (Sankaranarayanan *et al.*, 2014). Iraq is located in the geographical region of Western Asia (Figure 1-2), which includes the following countries; Iraq, Armenia, Azerbaijan, Georgia, Israel, Kuwait, Jordan, Lebanon, Oman, Palestine, Qatar, Turkey, Syria, Saudi Arabia, Yemen (Bruni L *et al.*, 2016). In Iraq, about 10.7 million women are at risk for cervical cancer (Bruni L *et al.*, 2016). Persistent infection with *Human papillomavirus* (HPV) is currently affirmed as the main cause of cervical cancer, but data on the HPV burden in the general population of Iraq are not yet available. However, 2.3% of women in the general population of Western Asia, the region in which Iraq is situated, are estimated to have a cervical HPV 16-18 infection (Bruni L *et al.*, 2016), compared to 11.7% among women with normal cytological findings worldwide (World Health Organization , 2012). According to a systematic review and meta-analysis performed by the Information Centre on HPV and Cancer (Institut Català d'Oncologia ICO), up to December 2014 no data was available on HPV prevalence in Iraq (Bruni L *et al.*, 2016). It is clear that a consequence of Iraq's years of isolation and disorder has been a loss of research capacity (Garfield *et*

al., 2003, Al Hilfi *et al.*, 2013). It's evident that currently the primary prevention for cervical cancer is not sufficient in Iraq to follow the recent advances in the sciences of preventative health care services. It is suggested that failure to prevent cervical cancer in Iraq is due to the absence of a cervical cancer screening programme; as a result most patients with carcinoma of cervix present in the late stage (Ameen and Helmi, 2013). The current situation for Iraqi health professionals and citizens seeking healthcare is a result of significant deterioration in the 1990s. Following the 1991 Gulf War and the international sanction regime during the 1990s, medicine imports declined by 85-90%. Iraqi physicians and nurses were faced with diminishing materials and medicines, while the health needs of the population grew (due to post-conflict and poverty-related health needs) (Garfield *et al.*, 2003). Iraq's health services are struggling to regain lost momentum. Some of the important consequences of war include displacement of people, disruption of healthcare services, with subsequent loss of infrastructure, all of which make the establishment of successful screening programmes particularly difficult. Most importantly many skilled health workers have moved to other countries and young graduates continue to leave (Al Hilfi *et al.*, 2013). Lack of, or ineffective, interventions may increase cervical cancer burden above the current projection in most Asian countries (Sankaranarayanan *et al.*, 2014). Cervical cancer screening is therefore under researched in Iraq. I found very few studies exploring women's and health care providers' knowledge and practices toward HPV testing and use of Papanicolaou (Pap) smears, with no studies attempting to explore the evidence needed for establishing a population based cervical cancer screening programme. This doctoral study will focus on the practical challenges facing health care professionals working in cervical cancer screening departments in Iraq, as well as exploring women's perception regarding smear tests; a cytological test that permits cervical lesions to be detected before they become cancerous (Wasti *et al.*, 2004). This will be done to identify which factors need

attention to in order to design a population based cervical cancer screening programme for the Iraqi population. The probability of attendance in an organized screening programme is higher among women who are aware of cervical screening (Hansen *et al.*, 2011), therefore it might be possible to increase attendance rate through improving the public knowledge of screening (Hansen *et al.*, 2011). The results of this study will provide a basis for making inferences not only about cervical cancer screening organization in Iraq but also for countries with a similar geo-political background that are yet to introduce a nationwide cervical cancer screening programme.

Figure1-1 Limited data on cervical cancer incidence in Iraq adopted from Bruni L *et al.* (2016)

Indicator	Iraq	Western Asia	World
Annual number of new cancer cases	291	4,455	527,624
Crude incidence rate ^a	1.7	3.8	15.1
Age-standardized incidence rate ^a	2.8	4.4	14.0
Cumulative risk (%) at 75 years old ^b	0.3	0.5	1.4

Data accessed on 15 Nov 2015.

No country-specific incidence data available. Incidence rates were estimated partitioning age/sex specific rates for 'all cancers' using data on relative frequency of different cancers (by age and sex). For more detailed methods of estimation please refer to <http://globocan.iarc.fr/old/method/method.asp?country=368>

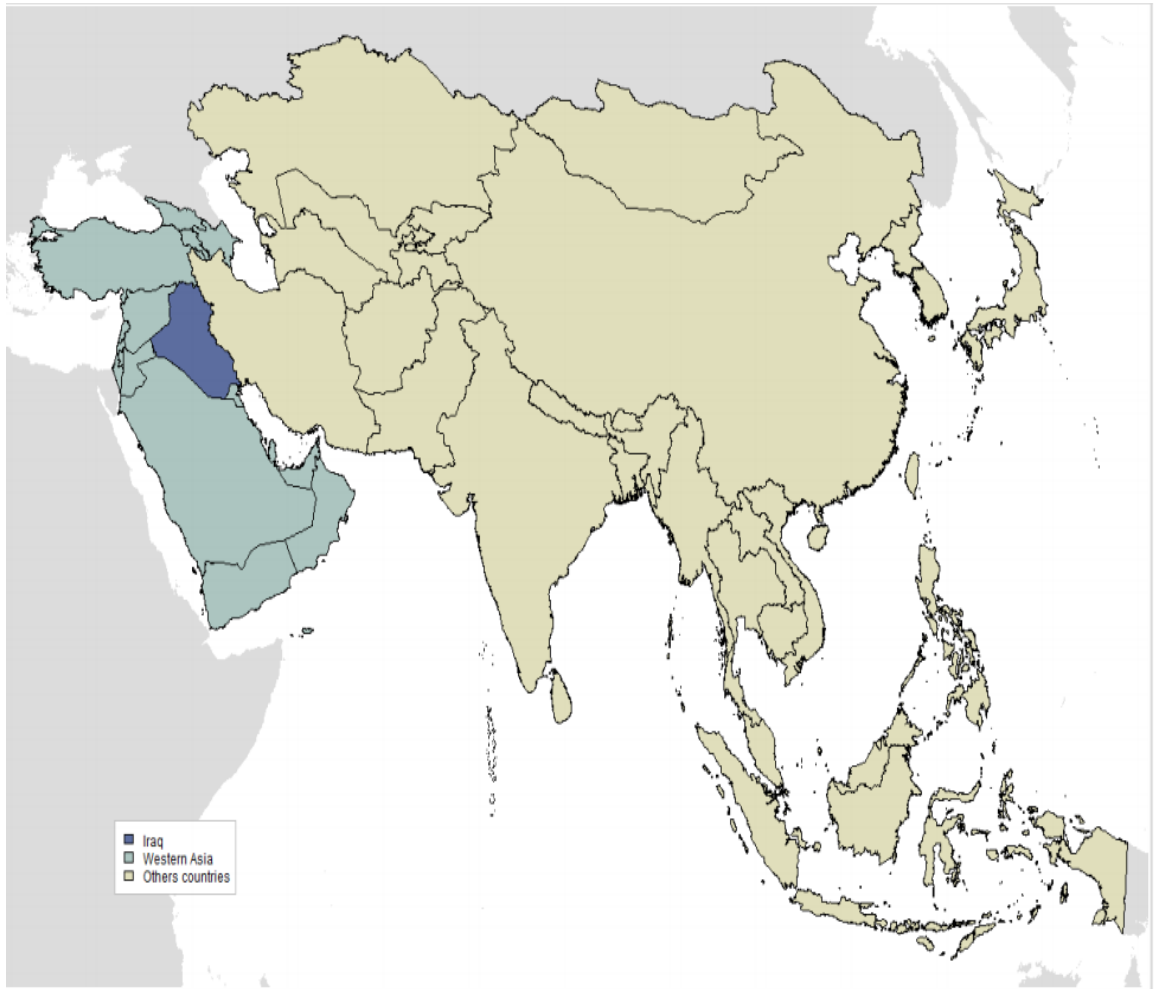
^a Rates per 100,000 women per year.

^b Cumulative risk (incidence) is the probability or risk of individuals getting from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to develop from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.

Data sources:

Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: <http://globocan.iarc.fr>.

Figure 1-2 Iraq and western Asia adopted from Bruni L *et al.*, 2016



1.2 Background

Overview

In this chapter I will provide information on cervical cancer, the global burden of cervical cancer, pathogenesis of cervical cancer (CC) and risk factors, clinical features and staging. I will also cover HPV induced cervical cell changes, prevention and control of cervical cancer, screening and criteria for the screening programme; provide a description of the national situation regarding cervical cancer in the United Kingdom (UK) and Ireland and the burden of cervical cancer in Western Asia and Middle East Arab Countries. I will also describe the focus and content of the thesis.

1.2.1 Global burden of cervical cancer

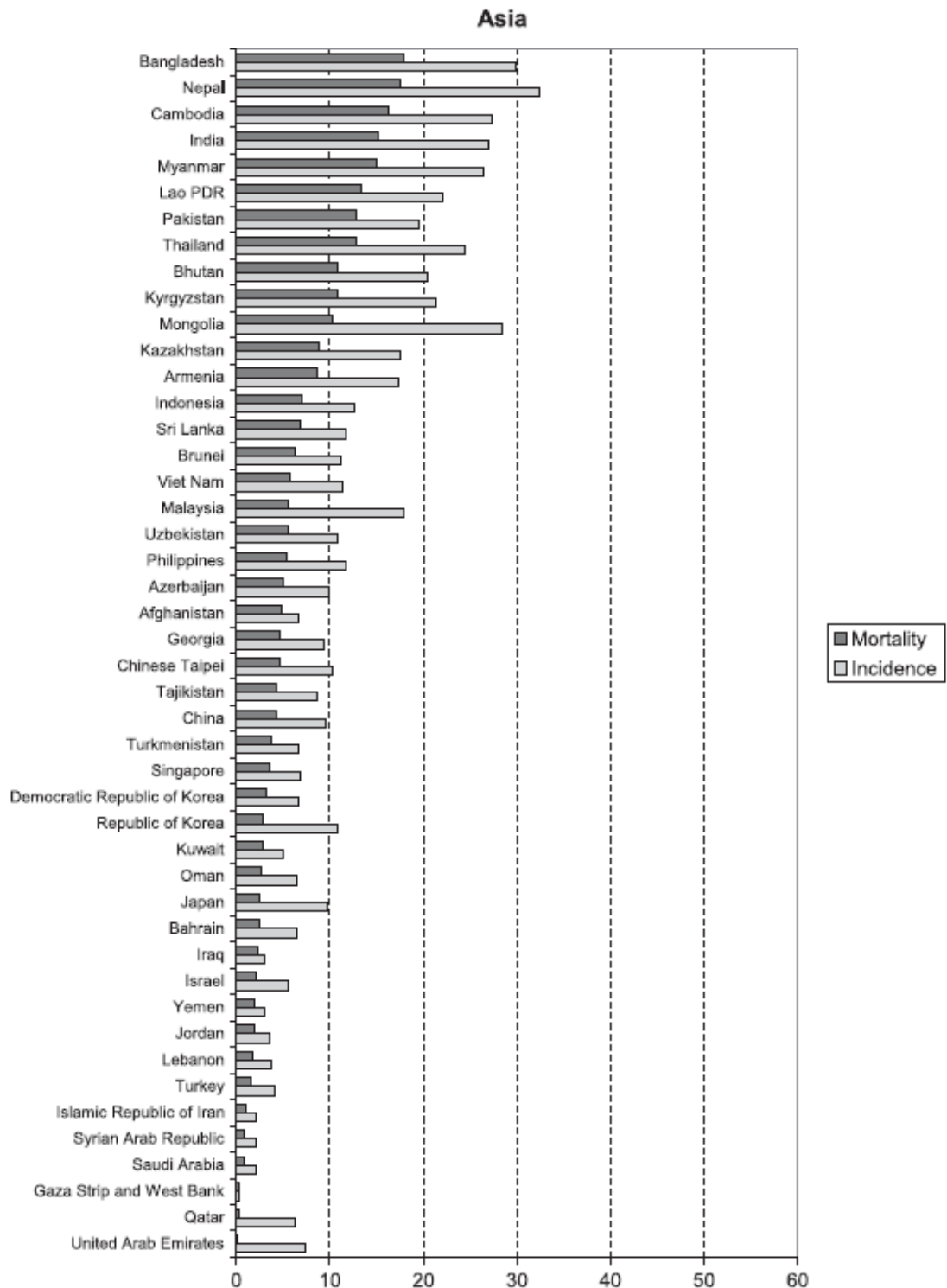
Cervical cancer is an important women's health problem, being one of the most common cancers among women worldwide, with an estimated incidence of 528,000 new cases annually (Villalobos C *et al.*, 2016). Cervical cancer is a cancer that affects the cells in the lower part or the neck of the uterus as a result of persistent infection with *Human papillomavirus* (HPV) (Dunleavey, 2008). More than 90% of cervical cancers develop within a small area of the cervix known as transformation zone and disease progression from dysplasia to invasive cancer is usually slow, providing the opportunity to detect and treat pre-cancerous changes early (Everett *et al.*, 2011). About 80% of cervical cancer may arise from the squamous cells that cover the outer surface of the cervix and this is known as squamous cell carcinoma (SCC), whereas adenocarcinoma which arises from the glandular cells is less common and applies to 15-20% cases (Dunleavey, 2008).

Internationally, cervical cancer has been considered as the third most common form of cancer after breast and colorectal cancer (Al-Meer *et al.*, 2011). A woman's risk of developing this disease by age 65 ranges from 0.8% in developed countries to 1.5% in

developing countries (Everett *et al.*, 2011). In 2008, 86% of all cervical cancers and 88% of all deaths caused by cervical cancer occurred in developing countries (Arbyn *et al.*, 2011). The age standardised incidence rate (ASIR) was 18 and the age standardised mortality rate (ASMR) was 10 per 100,000 population in developing countries compared to 9 and 3 respectively per 100,000 in developed countries (Arbyn *et al.*, 2011). Cervical cancer is the most common cause of cancer death in Eastern, Middle and Western Africa; Central America; South Central Asia and Melanesia, whereas it is a predominant cancer among women in Eastern Africa; South- Eastern Asia and Melanesia (Arbyn *et al.*, 2011). India is the country with the highest disease frequency with 134,000 cases and 73 000 deaths (Ibeanu, 2011).

In Europe and the USA, the five year survival rate is between 60%-70% and in England and Wales it was 64% between 2001 and 2006 (Everett *et al.*, 2011). The lowest ASIR are observed in Western or South Central Asia, as indicated by Figure 1-4 (Arbyn *et al.*, 2011). *Human papillomavirus* is considered to be the primary cause of cervical cancer, with an estimation prevalence of HPV worldwide of 99.7%: in particular, types 16-18 are present in more than 80% of invasive cervical cancers (Everett *et al.*, 2011). Primary prevention is the best strategy to reduce the burden of any disease (Goddard and Smith, 2001), and in the case of cervical cancer the main secondary prevention is the early detection of abnormal cell changes with cytology screening or regular examination of the cervix (Goddard and Smith, 2001). The greatest protection against cervical cancer currently available is the combination of HPV vaccination before first sexual intercourse and a screening programme with repeated smear tests (Scarinci *et al.*, 2010).

Figure 1-3 Age-standardised rates of incidence of and mortality from cervical cancer (per 100 000 women-years) in Asia adopted from Arbyn *et al.* (2011)

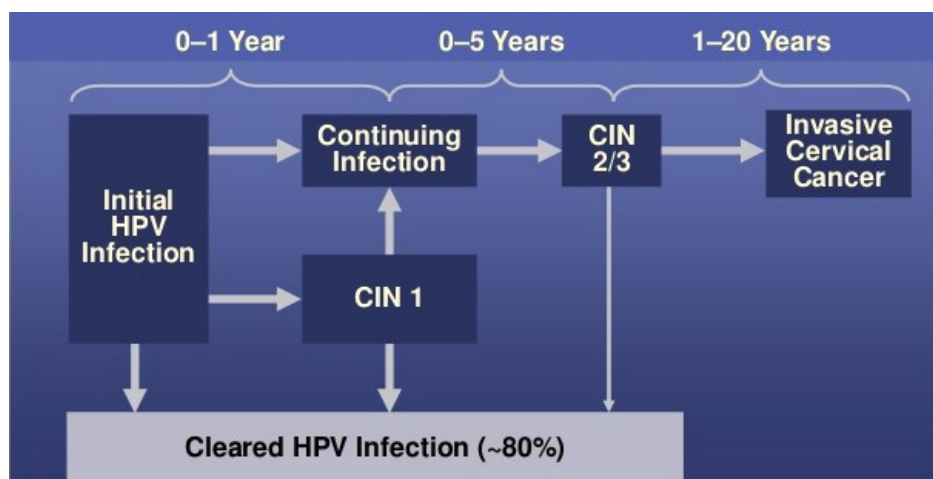


1.2.2 Pathogenesis of cervical cancer

Persistent infection with one of about 15 genotypes of carcinogenic HPV causes almost all cases of cervical cancer (Mayrand *et al.*, 2007). Previous research has shown that a range of cofactors may be involved in the progression of cervical neoplasia, for example, smoking, immunosuppression and human immunodeficiency virus, whilst the most notable risks are early age of sexual activity, multiple sexual partners and sex steroid hormone therapy (i.e. oral contraceptives) (Arends *et al.*, 1998, Ibeanu, 2011). The components of tobacco smoke such as nitrosamine can be visible in cervical mucus and smoking related DNA adducts have been shown in normal epithelium next to intraepithelial and invasive neoplasia, indicating a direct effect on cervical epithelium at the DNA level (Arends *et al.*, 1998). Further, previous scientific studies over the past few decades have provided conclusive evidence that CC is a sexually transmitted disease, resulting from infection with certain high-risk oncogenic types of the HPV (Ibeanu, 2011). Cervical cancer arises through a chain of four steps: HPV transmission, viral persistence, progression of a clone of persistently infected cells to precancerous cells, and finally, invasion (Schiffman *et al.*, 2007). The primary precancerous lesion is known as cervical intraepithelial neoplasia (CIN) and it is classified into three grades: CIN1 correlates with mild dysplasia, CIN2 with moderate and CIN3 includes severe dysplasia, also termed high grade squamous intraepithelial lesions (HSILs), carcinoma *in situ* and invasive carcinoma (Figure 1-5) (Phillips *et al.*, 2016). Evidence shows that most of the supposed co-factors appear to influence the progression to cervical intraepithelial neoplasia grade three (CIN3) from latent HPV infection or low CIN (Schiffman *et al.*, 2007). Risk of CC is mainly a function of HPV infection and lack of effective screening. Poor access to cervical cancer services, in addition to non-compliance with screening visits, were most frequently observed as social risk factors related to lower socioeconomic status and lower educational levels in American Indian,

African American and Hispanic women (Ibeanu, 2011). Correspondingly, a number of studies have found lack of knowledge and low awareness about cervical cancer as well as screening uptake among women from Western Asia and Middle East Arab countries (Al-Meer *et al.*, 2011). There is evidence of risk from a small number of studies focusing on cervical cancer screening in countries with large population of Muslim women (Guimond and Salman, 2013). Previous studies have reported the underlying beliefs and perceptions of health among Arab Muslims to be greatly influenced by their culture, while socio-cultural stigma relating to the disease is relevant. Muslim women are a population with unique cultural and religious traditions, some of these traditions and beliefs influence their use of the health care system (Guimond and Salman, 2013). Researchers have found that Muslim women may not seek medical care unless they are experiencing specific health problems, women do not have any exposure to preventive or regular women’s health until after their marriage (Matin and LeBaron, 2004). Women living in Iraq are at risk for cervical cancer, although they do not perceive themselves to be at risk. Hence, health care providers need to use a culturally sensitive approach to conduct “well-women” examinations that involve regular cervical cancer screening.

Figure 1-4 Progression of cervical cancer after HPV infection Phillips *et al.*, 2016



1.2.3 HPV induced cervical cell changes and cervical cancer

Human papillomavirus is a small, non-enveloped DNA tumour virus (Ibeanu, 2011). There are at least one hundred different types of HPV classified phylogenetically with the alpha, beta, gamma, delta and mu genera based upon differences in their nucleotide sequences (Ibeanu, 2011). The HPV types most commonly associated with incidence of invasive cervical cancer are 16, 18, 31, and 33 (Smith *et al.*, 2007). Four HPV 16 variant types have been determined; African (AF-1, AF-2), European (E) and Asian American (Aa). Likewise, three HPV 18 variants are recognized; European (E), African (AF), Asian Amerindian (AsAi) (SgROI *et al.*, 1999). The creation of these variants is supposed to reflect the migration and sexual behavioural patterns of human population (Ibeanu, 2011). Many genotypes of HPV have been identified; strains being classified as high-risk or low-risk according to their potential to cause cervical lesions. Each genotype acts as an independent infection with various carcinogenic risks related to evolutionary species (Ibeanu, 2011). Those categories refer to their association with cervical lesions: pre-malignant or malignant lesions are usually linked to high-risk HPV and benign ones to low risk HPV (Figure 1-6) (Ibeanu, 2011). It is considered that 75% of HPV infection and its consequences are caused by HPV 16-18; these two subtypes of HPV seem to relate to a huge extent worldwide to their role as the major cause of cervical cancer (Ghim *et al.*, 2002). *Human papillomavirus* infection is a highly transmissible infection and the majority of sexually active women will likely have an HPV infection in their life time (Castellsagué, 2008). All HPV types have been shown to inhabit the skin or the mucosal epithelium (genital, anal, mouth and airway) (Castellsagué, 2008). In fact HPV types are tissue tropic and mostly lesion specific as well, meaning that pre-malignant and malignant lesions of the cervix are associated with different HPV types than those seen in benign extra genital warts (Ibeanu, 2011). Substantially, all CC are sexually transmitted diseases caused by carcinogenic HPVs

that are unblocked by barrier contraceptives and infect unstable cervical squamous epithelium of the transformation zone (Ghim *et al.*, 2002). Furthermore, young women have a large area of immature metaplastic cervical epithelium (Ghim *et al.*, 2002). The consequence of this puts them at high risk for developing cervical neoplasia if sexual activity begins at early age, especially with multiple partners harboring carcinogenic HPV (Ghim *et al.*, 2002). Carcinoma of the cervix induced by HPV can develop within two years of the initial infection of unstable squamous epithelia of the endocervix; however, most cancers develop from precursor lesions that progress from one stage to another over 10-30 years (Ghim *et al.*, 2002). Overtime, uninfected metaplastic squamous epithelium matures and become more susceptible to low risk viruses like HPV-6 (Ghim *et al.*, 2002).

Figure 1-5 HPV classification into high and low risk types Ibeanu (2011)

Low-risk types	6, 11, 40, 42–44, 54, 61, 72, 81
High-risk types	16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 82

On average HPV infection clears within 1-2 years in 90% of cases and only 50-60 % of women develop serum antibodies to HPV after natural infection (Santesso *et al.*, 2016). The median time to clearance of HPV infections detected during screening is 6-18 months (Clifford *et al.*, 2003). Cohort studies with up to 10 years of follow up data have indicated that after clearance the same HPV type can occasionally reappear (Beachler *et al.*, 2017).

Human papillomavirus causes virtually 100% of cervical cancer cases, and underestimation of HPV prevalence in cervical cancer is most likely due to the limitations of study methodologies (Clifford *et al.*, 2003). Worldwide, HPV 16 and 18 contribute to all cancer cases in between 46% and 67% of high grade cervical lesions and 16 -32 % of low grade cervical lesions, after which the six most common HPV

types are 31,33,35,45,52 and 58, account for an additional 20% of CC cases worldwide (Bruni L *et al.*, 2014). A literature search did not identify any studies on the *Human papillomavirus* prevalence in Iraq (Bruni L *et al.*, 2016). However, in recent years, some studies have focused on the prevalence of HPV in women with abnormal smear tests in different cities of Iraq. For example, Mohammed and Rifat (2015) investigated 55 abnormal smear tests from women attending hospital and private clinic in Kirkuk, Iraq and found that 58.2% of patients were positive for HR-HPV. The incidence was highest among the age group 21-30 years (90.9%) and lowest at the age group ≥ 51 years 25% (Mohammed and Rifat, 2015). With the same objectives, Fadhil *et al.* (2014) conducted an experimental study comparing 235 women from Baghdad, Iraq (188 with cervical dysplasia (CIN1, CIN2, and CIN3), 7 with cervical cancer, and 40 with atypical squamous cell ASC and cervicitis) with 25 healthy women who acted as a control group. Results showed that HPV-DNA was detected in 28.94% (68/235) of the abnormal cases but in none of the control group. Further to these studies, Fadhil *et al.* (2014) also investigated seventeen different HPV genotypes among 68 infected women and showed that the predominance of genotype was HPV-59 at 14.4% followed by HPV-16 at 13.3% being the most common type in HSIL. The HPV -18 was detected in three (4.4%) cases. Interestingly, the finding of this study indicates the presence of ten different HPV genotypes (HPV -39,-44, -45,-51,-52,-53,-58,-59,-66 and -68) for the first time among Iraqi women with cervical lesions and the study recommended the importance of introducing the HPV vaccine in Iraq (Fadhil *et al.*, 2014). In addition, Pity *et al.* (2012) focused on the possible association of smear test results with HRHPV and HSIL among women from Duhok, Iraq and stated that HRHPV DNA was demonstrated in 40% of ASCUS and 57.1% of atypical squamous cells. A careful study of the literature reveals that the incidence of HPV infections has increased significantly among Iraqi women. A number of studies have detected HPV genotypes previously unseen in Iraq and many

conclude that it is essential to add the HR-HPV test to smear test to increase the sensitivity of primary screening for cervical cancer in Iraq. Whilst no studies focused on examining the effect of HPV infection on the incidence of cervical cancer in Iraq, unquestionably, many results indicate the importance of the introduction of the HPV vaccine.

1.3 Prevention and control of cervical cancer

One measure of the effectiveness of a health care system is that of cancer survival (Sancho-Garnier *et al.*, 2013). Worldwide variation in cancer survival shows the level of preventable mortality which supports the development of initiatives against cancer (Thaxton and Waxman, 2015). Many kinds of medical screening programmes are used around the world; these include screening for early stage disease and for disease carriers. The term screening used in this thesis refers to the use of smear test / cytology in the healthy population to identify individuals who might not yet have developed symptoms (World Health Organization , 2012). Screening is a speculative identification of specified disease or particular condition among asymptomatic individuals by means of tests or examination, in contrast to diagnosis, which is defined as the application of tests to symptomatic individuals who seek health services to identify the cause of their symptoms (Sackett and Holland, 1975). The uniqueness of screening is that the test is offered without individual consideration and to make it applicable to a large population, it should be relatively inexpensive, painless, convenient and safe (Morrison, 1992). Cervical cancer can be prevented in two ways: primary prevention aimed at preventing HPV infection through prophylactic HPV vaccination; and secondary prevention aimed at preventing precancerous lesions from progressing to invasive through screening and early cancer detection (Ngan *et al.*, 2011). These two programmes can be implemented in parallel or separately, depending on the availability of adequate infrastructure and

resources. Ideally, the combination of HPV vaccination programme together with effective screening programme and treatment of precancerous lesions has the greatest potential to reduce the burden of cervical cancer (Ngan *et al.*, 2011).

Screening for precancerous lesions can be performed in several ways involving cervical cytology (smear test), visual inspection of the cervix with acetic acid (VIA) or testing for HRPHV DNA. Each of these methods has specific requirements that national health services should consider when planning a screening programme (Scarinci *et al.*, 2010).

The smear test was the first screening test for cervical cancer to be introduced and it is still the most widespread. The smear test is highly specific, but the sensitivity is negatively influenced by inadequate sample collection and errors in screening and interpretation of the smear (Mayrand *et al.*, 2007). In Western countries, rising concern about the medico-legal liability has led to the development of automated systems to increase sensitivity of the smear test. The Auto PAP300 QC system (an automated device for the analysis of conventionally prepared cervical cytology slides) and PapNeT (a semi-automated cytological screening computerized image system that uses neural network-emulating software to help detect abnormal cells on conventionally prepared and stained cervical smears) are examples of computerized instruments for the analysis of cytological preparation (Ku, 1999). The sensitivity of cytology can also be improved by the use of Liquid Based Cytology (LBC), thin-layer cytology sample obtained from the transitional zone of the cervix and dispersed in a liquid suspension and subsequently centrifuged and passed through a filter using Thin Prep technology (Abulafia *et al.*, 2003). The sample obtained from the suspension results in a monolayer preparation with well-preserved cellular morphology and absence of air-drying (Abulafia *et al.*, 2003). Visual inspection using acetic acid (VIA) (an application of acetic acid to the cervix and any white lesion is observed either with naked eye or through colposcopy) is an alternative to the smear test, and has emerged in low-resource settings where it is

performed by trained health professionals (Moore, 2013). The authors of several studies in the literature have concluded that no single test can be adopted to replace the smear test in routine clinical studies on evidence based cervical cancer prevention (Franco and Harper, 2005, Franco, 2004, Ronoco *et al.*, 2007). The choice of test is complicated by cultural variables, financial and human resources and advocacy to develop a comprehensive cervical cancer screening programme (Moore, 2013). Western Asia and Middle East countries have highly variable health services development and health care infrastructures as a result of their diverse economic development, health care policies and investments (Sankaranarayanan *et al.*, 2014). Many researchers have argued that the most effective means for early detection in rural areas of developing countries is direct visual inspection with acetic acid or Lugol's iodine (Sankaranarayanan *et al.*, 2012). Trained paramedical workers and doctors could perform the visual inspection, and this has been reported as an effective screening option in low resources settings (Bhatla *et al.*, 2004). However, where affordable, LBC or conventional cytology together with effective treatment should be the focus for most of the WAMEM countries (Garland *et al.*, 2008). Whatever methodological approach adopted, opportunistic screening is known to have limited efficacy, with over screening of a minority added as a disadvantage (Moore, 2013).

The importance of HPV DNA testing in cervical cancer screening programme was reported by Kjær *et al.*, (2010) who showed that persistent HPV infection increased the risk of developing cervical neoplasia. HRHPV detection techniques have now been supported as primary screening tests and secondary triage tests for those women whose smear tests detected atypical squamous cells of undetermined significance (ASCUS) (Kjær *et al.*, 2010). This method is considered as a possible screening method which could be applicable for low–middle income countries where the primary health care centres are overstretched overwrought (Sankaranarayanan *et al.*, 2014). Previous

studies and reviews indicate that HPV testing is more sensitive than smear testing for identifying cervical cancer and its precursors (Mayrand *et al.*, 2007).

1.3.1 Criteria of screening programme

The prime idea of early disease detection and treatment is ultimately simple. However, how to achieve it successfully is far from straightforward (Andermann *et al.*, 2008). For this reason, Wilson and Jungner (1968), attempted to define screening criteria to guide the selection of conditions that would be suitable for screening, based on the capacity to detect the condition and the availability of an acceptable treatment Table 1-1 (Andermann *et al.*, 2008). However, several adaptations have been made to their classic criteria and several new criteria have emerged as well Table 1-2. The majority of adaptations to the classic criteria are related to developments in genetic screening; the importance of serious, but rare, genetic conditions; the intimation of genetic information for family members; the need for analytical validity of screening test and the possibility of interventions (Andermann *et al.*, 2008). Conversely, plenty of the emerging criteria reflect comprehensive trends that have shaped both western medicine and society commonly over the past generations. The modified Wilson and Junger criteria transformed into a more detailed decision support guide. The guide consists of ‘three levels of analysis that contribute to integrating various types of scientific and contextual evidence, making explicit the iterative nature of decision –making, balancing different perspectives, comparing various alternatives, considering whether implementation in a given context will allow the benefits of the screening programme to be realized, and emphasizing that adequate governance and regulatory frameworks are required’ (Andermann *et al.*, 2008). Ultimately, the decisions to develop, implement and continue to fund screening programmes are political (Juth and Munthe, 2011). Even though the screening tests themselves may be low-cost and suitable for large

standardize use, the infrastructure and human resources needed to be provide appropriate education, interventions, counselling and follow-up are probably to be more costly (Andermann *et al.*, 2008).

Table 1-1 Wilson and Junger (1968) classic screening criteria 1968

The condition explored should be an important health problem
There should be a convenient test or examination
Resources for the diagnosis and treatment should be available
The test should be acceptable to the population
Acceptable treatment for patients with recognized disease
A recognizable implicit or early symptomatic stage
The epidemiology of the condition including development from latent to declared disease should be adequately understood
An agreed policy on the targeted population
The cost of the case finding should be economically balanced in relation to possible expense including diagnosis and treatment
Case finding should be continuous

Table 1-2 Composition of emerging screening criteria proposed over the past 40 years

The screening programme should respond to recognized needs
Defined target population
Defined aims of the screening
Scientific evidence of screening programme effectiveness
Integration of education, testing, clinical services and programme management
Quality assurance, with mechanisms to minimize potential risks of screening
Confirmation of informed choice, confidentiality and respect for autonomy
Promotion of equity and access to screening for the entire target population
Planning for the programme evaluation
The general benefits of screening should exceed the harm

The updated United Kingdom (UK) criteria for appraising the viability, effectiveness and appropriateness of the screening programme on the 23th October 2015 is shown in Appendix C

1.3.2 Description of the national situation of cervical screening in the UK and Ireland

It is crucial to highlight the difference of health care systems to allow proper interventions, as the role of different medical disciplines (such as public health, health care centres (GP) and gynaecology services clinics) differ significantly and these affect the organization of the programme. In this section I will present data relevant to the national decision-making on cervical screening programmes and brief national descriptions as well as up-dated information on the recent available resources in the UK.

Also, I am including data on cervical screening programme in Ireland, because the religious and cultural acceptability of the screening programme, as well as the organizational instability, has influenced the success in establishing a well-organized population-based cervical screening programme, which may therefore help inform the situation in Iraq. It has been suggested that middle-income developing countries, which currently provide inefficient screening, should reorganize their programmes in the light of experiences from other countries and lessons learnt from their past failures (Sankaranarayanan *et al.*, 2001)

UK- England

In 1988, regulation of a call recall system for inviting women to attend for initial and repeat smear tests as a part of national cervical cancer screening programme indicated the formal beginning of the National Health Service (NHS) cervical cancer screening. Screening was aimed at women aged 20 to 64 with the interval of at least 5 years, with smears being mainly taken by doctors in general practice (Anttila and Ronco, 2009). In 1990 a system of payments for general practitioners was introduced linked to their coverage rates. As a result the coverage rose to 80% of eligible women over the next few years. In 1994, Quality Assurance (QA) was introduced to the programme with the introduction of geographically-based teams that monitored the service locally. It was recommended that regular visits are carried out by regional teams to monitor the services locally with suggestions for improvement (Anttila and Ronco, 2009). In recent years the biggest changes to the screening programme came in 2003 as a result of an independent scrutiny following which the screening intervals were standardised at three yearly for women aged 25-49 years and five yearly for women aged 50-64 (Sasieni *et al.*, 2003). In the same year the age of the first invitation was raised to 25 years, along

with the decision to convert from conventional smear test to Liquid Based Cytology (LBC) (NICE and Britain, 2003).

In 2011, the advisory Committee for cervical screening recommended to the government that HR-HPV test be utilised for triage and as a test of cure (TOC) be implemented. Liquid Based Cytology, together with the testing for HR-HPV, facilitated triage of women with low grade abnormalities who were at greater risk of developing CC and required referral to colposcopy (T.Freeman-wang *et al.*, 2017). Rollout concluded in 2014 (Ferra, 2017). In 2016 the UK National Screening Committee recommended that HPV primary screening should be adopted by the National Health Service Cervical Screening programme (NHSCSP) and announcement was made that HPV primary testing would be implemented in England by 2019 (Ferra, 2017). The NHS cervical cancer screening programme is estimated to be saving around 3000 lives per year in England (Anttila and Ronco, 2009). Additionally, in order to assist in addressing the danger of increasing CC incidence caused by falling coverage among young women, the prophylactic HPV vaccine was introduced in the UK in 2008, when the introduction of an HPV immunization programme to routinely vaccinate girls at age of 12-13 years with a catch up to 18 years over the next 12 years was announced by the Department of Health (Landy *et al.*, 2014).

Ireland

In 2008, a national population based cervical cancer screening programme was introduced in Ireland (Anttila and Ronco, 2009). Gynaecology laboratory services have been provided in Ireland since 1960s on an opportunistic basis and since 2000, phase one of the Irish cervical screening programme offered free smear tests through a cervical cancer screening programme to women aged 25-60 years (Anttila and Ronco, 2009). In 2006, census data from the Irish Central Statistics Office stated there were

over one million women aged between 25 and 60. It was calculated that 80% of uptake rate was needed for the programme needed to be achieved for it to be successful which meant the annual number of smears performed would be up to 300,000 nationally on a call-recall basis (Anttila and Ronco, 2009). In 2007, the National Cancer Screening Services Board provided governance for the Irish cervical cancer screening programme and introduced a contractual model which consisted of a contract for the provision of cytology services with a delegated laboratory following a procurement procedure, contracts with medical practitioners in primary care for smear taking and service level agreements with colposcopy services. Eligible women can join the programme directly through referral from their medical practitioner or by self-registration. The smear takers are doctors or nurses that are registered with the programme: a licensed smear taker system is available from a number of Irish institutions in partnership with the programme. LBC is the single test in use in all of the Ireland and kits are provided by the programme (Anttila and Ronco, 2009). Cervical screening is operated by a Central Office and the Register Information System that maintains call and recall and administers the computerised clinical results that record women's cytology, cervical histology, colposcopy and hysterectomy conditions. This systematic strategy verifies that appropriate follow-up is provided (Anttila and Ronco, 2009). In 2008, the Health Technology Assessment demonstrated that the universal HPV vaccination of 12 years old females would be cost effective in Ireland, and the report recommended a one-off vaccination programme for 13-15 years old females (Anttila and Ronco, 2009).

Additionally, organized population based cervical cancer screening (CCS) has been established in many other developed countries and led to considerable reduction in the incidence of cervical cancer and its related mortality rate (Denny, 2012a). For example, in West Germany, a cervical cancer screening programme was launched in 1971 (Scheffer *et al.*, 2006); in Hungary, a nationwide organized screening programme was

established in early 2000 (Anttila and Ronco, 2009); and in Sweden, a computer systems linking cytology registers and invitation has been in action since the 1960s (Santesso *et al.*, 2016). The impact of organized cervical cancer screening has been evident: for example, the incidence of cervical cancer in the United States dropped by about 90% over the past half century due to effective implementation of cervical cancer screening and treatment protocols even though 80% of sexually active US adults will acquire HPV during their lifetimes (Ibeanu, 2011). A further instance of this is 40% reduction in the incidence of cervical cancer in Australia and 60% the United Kingdom (UK) between 1975 and 2004 (Anuradha *et al.*, 2014, Denny, 2012a).

1.3.3 Burden of cervical cancer in Western Asia and Middle East Arab Muslim countries

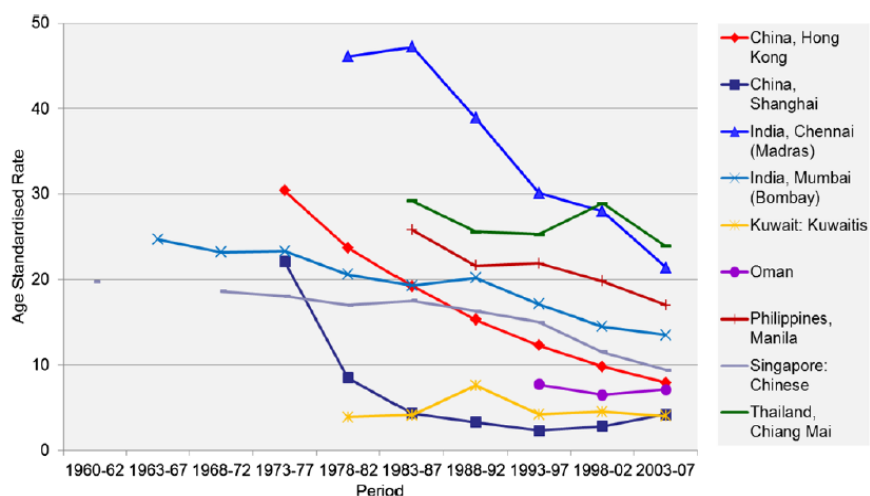
I use the term ‘Western Asia and Middle East Arab Muslim countries’ (WAMEMs) to refer to Arab Muslim countries situated in Western Asia. These countries are: Oman, U.A.E, Bahrain, Lebanon, Kuwait, Syria, Qatar, Palestine, Iraq, Saudi Arabia, Yemen and Jordan (Moore, 2013).

The incidence of cervical cancer in (WAMEMs) is difficult to estimate because of the lack of national cancer registries in many countries of this region (Sancho-Garnier *et al.*, 2013). Western Asia Arab Muslim countries incorporates a range of countries with disparities in ethnicity, sociocultural practices and traditions, socioeconomic development norms and dietary habits, these are all considered to be reflected in the burdens and patterns of cancer in different regions of Asia (Sankaranarayanan *et al.*, 2014). The quality and availability of the data are very different from one country to another, moreover, statistics about some of the countries within this region are missing due to various reasons such as war (Libya, Syria and Palestine) or lack of published data

(Iraq) (Sancho-Garnier *et al.*, 2013). The incidence of the ten most common cancers in men and women are estimated to increase in Asia from 6.1 million in 2008 to 10.7 million in 2030 and cancer deaths from 4.1 million in 2008 to 10.7 million in 2030 (Sankaranarayanan *et al.*, 2014). Each country in Asia varies with regard to the burden of cervical cancer, political background, economic status, and resources available for cervical cancer control. According to data from the International Association for Cancer Registries published in 2000, cervical cancer ranked the eighth most common cancer in Jordan and Saudi Arabia (Moore, 2013). In Lebanon, CC account for 2% of all female cancers: it ranked eighth among female cancers in 2007 (Sancho-Garnier *et al.*, 2013). In the countries of Asia with low human development index (HDI) the incidence of cervical cancer is reported to be greater than for breast cancer and the lack of interventions may increase the future burden of these types of female cancers (Garland *et al.*, 2008). The rate of cervical cancer is high in south and south East Asia and a substantial number of Asian women continue to develop and die from the disease (Figure 1-8) (Sankaranarayanan *et al.*, 2014). Changing lifestyles, obesity, change in reproductive patterns and diet, increasing urbanisation, tobacco use, alcohol drinking, increasing life spans and chronic infections contribute to an ever-increasing cancer burden in Asia. The proposed increase will be larger in low and medium resource countries, excluding rich economies such as Saudi Arabia, United Arab Emirates Qatar, Kuwait and Bahrain (Moore, 2013). Despite the fact that no country is the same, experience shows that problems encountered could be similar and it is possible to learn from each other's experience to find innovative solutions (Sankaranarayanan *et al.*, 2014).

Figure1- 6Trends in the incidence of cervical cancer in selected Asian countries

taken from Sankaranarayanan *et al.* (2014)



Cancer health services are inadequate and yet developing in most Asian countries. There is a significant variation in the evolution of the diverse cancer control constituents and access to cancer care can be seen within countries corresponding to their level of income (Table 1-4). High-income countries such as Kuwait, Qatar, and the United Arab Emirates have well developed health services while the vast majority of the population living in many low-middle income countries have quite limited services. Despite the fact that Iraq is categorised as a higher to middle income country, as shown in Table 1-4, cancer health systems are fragmented and mostly centred in the capital cities, with under placement of essential equipment and human resources. Healthcare services are mostly through private clinics. Although Iraqi's population has been transitioning through considerable demographic changes, the Ministry of Health has not kept pace in developing appropriate policy. Government remains heavily centralized (Al Hilfi *et al.*, 2013). Major policy changes are needed at almost every level of governance, but there is little data available to support evidence based decision making (Al Hilfi *et al.*, 2013). Regardless of the increasing prevalence of cancer, it remains a low priority in health care planning and spending in most low middle income countries (Sankaranarayanan *et*

al., 2014). Cancer health services consist of policies and governance, infrastructures and systems for awareness creation, early detection, diagnosis, prevention, staging, treatment, follow up care, palliative care and regular scrutinizing of health services by evaluation (Sepúlveda *et al.*, 2002). Health services should be supported by adequate financial resources through dedicated budgets and appropriate healthcare financing and cost retrieval techniques for sustained delivery of services in addition to information systems for monitoring and evaluation. The essential components of health services are shown in Table 1-5.

**Table 1- 3 Cancer health services in Asia by per capita gross national income
(GNI, 2012) taken from Sankaranarayanan *et al.* (2014)**

Income category	Countries (N=48)	Cancer health services and infrastructure
<p>Low-income countries (per capita GNI < US\$1,036)</p>	<p>Afghanistan, Bangladesh, Cambodia, Democratic Republic of Korea, Kyrgyzstan Republic, Myanmar, Nepal, Tajikistan</p>	<p>Poorly developed healthcare infrastructure and overextended services far exceeding capacity, limited human resources, poorly supported by government financial resources. Healthcare financing is mostly by catastrophic out-of-pocket expenditure.</p> <p>The level of development and planned annual vertical investments by governments in infrastructure and in terms of financial and human resources fall far short of the level to ensure equitable access to preventive, diagnostic, treatment and follow-up care for the general population. More than three-quarters of patients with cancer do not receive adequate care, with poor survival prospects. Some countries such as Bangladesh are working towards universal health coverage.</p>
<p>Lower-middle-income countries (per capita GNI</p>	<p>Armenia, Bhutan, India, Indonesia, Laos, Mongolia,</p>	<p>Cancer health systems are fragmented and mostly centred</p>

<p>US\$1,036 to US\$4,085)</p>	<p>Pakistan, Philippines, Sri Lanka, Syria, Timor-Leste, Uzbekistan, Vietnam, Yemen, West Bank and Gaza</p>	<p>in urban areas, with underinvestment in equipment, essential consumables and drugs and human resources development; vast regional variation of services within countries exists, with extremely limited availability of and access to care for rural and Socio-economically disadvantaged populations. Some countries such as India, Indonesia, Philippines, Sri Lanka and Vietnam are working towards universal health coverage</p>
<p>Higher-middle-income countries (per capita GNI US\$4,086 to US\$12,615)</p>	<p>Azerbaijan, China, Georgia, Iran, Iraq, Jordan, Kazakhstan, Lebanon, Malaysia, Maldives, Thailand, Turkey, Turkmenistan</p>	<p>Cancer health systems are still evolving with less integrated multiple independent systems of care; considerable potential for further improvements in infrastructure, coverage and healthcare financing in most countries. Rural areas have inadequate services in large countries such as China. Some countries such as Thailand, Malaysia and Turkey have much better facilities and systems developed with universal health</p>

		coverage providing seamless access for prevention, early detection and satisfactory clinical management of common cancers and improved survival outcomes
High-income countries/regions (per capita GNI > US\$12,616)	Bahrain, Brunei Darussalam, Hong Kong SAR of China, Israel, Japan, Republic of Korea, Kuwait, Macao SAR of China, Oman, Qatar, Saudi Arabia, Singapore, Taiwan, United Arab Emirates	High government investment in well organised healthcare infrastructure, well-resourced and highly accessible diagnostic and treatment services, facilities exist for early detection, advanced state-of-the-art diagnostic and treatment services within public health services, expatriates contribute to a high proportion of human resources (healthcare providers) in West Asian high-income countries.

Table 1-4 Components of Health Services Sepúlveda et al. (2002)

Components	Factors
Effective leadership and governance committed to health equity through sound public health policies and effective and accountable governance	Responsible for national cancer healthcare policies, plans and strategies and their implementation by effective governance of financing, infrastructure, human resources, drugs, technology and service delivery with relevant guidelines, plans and targets
Adequate financing of health services (health financing) to develop optimal healthcare infrastructure, recruitment and retention of human resources and to ensure universal health coverage by removing financial barriers to access and by preventing financial hardship and out-of-pocket catastrophic expenditure	Government budget lines, a system to raise and pool donor funds fairly
	Social security and employee insurance schemes and cost recovery mechanisms
	A financing governance system supported by relevant legislation, auditing and public expenditure reviews and clear operational rules to ensure timely and efficient use of funds
Adequate human resources for healthcare administration and delivery	Investing in and improving education through academic initiatives
	Recruitment, distribution, and retention by appropriate payment systems with right incentives
	Enhancing productivity, performance, competency and skills by in-service training, reorientation, continuing education opportunities, establishment of job-related norms, support systems, enabling work environments and job promotion opportunities

Ensuring universal access to essential diagnostics, vaccines, drugs and technologies	National lists of essential medical products, national diagnostic and treatment protocols, and standardised equipment per levels of care to guide procurement, to promote rational prescription and reimbursement
	A supply and distribution system to ensure universal access to essential medical products and health technologies through public and private channels, with focus on the poor and disadvantaged
	A medical products regulatory system for marketing authorisation, quality assurance and price and safety monitoring, supported by relevant legislation and enforcement mechanisms
Service delivery through a network of primary, secondary and tertiary care networks	Preventive services (health education, awareness, control of tobacco/alcohol/other cancer risk factors, healthy diet, promotion of physical activity, obesity/overweight control, hepatitis B virus (HBV) and human papillomavirus (HPV) vaccination)
	Early detection services (population awareness on early symptoms/signs, improving early detection skills of primary care practitioners by in-service training and reorientation, screening, early diagnosis, development of referral pathways)
	Diagnosis and staging (histopathology, cytology, haematology, immunohistochemistry, tumour markers, biochemistry, microbiology, x-ray, magnetic, ultrasound and nuclear imaging and endoscopy services)

	Treatment services (cancer surgery, radiotherapy, chemotherapy, hormone therapy targeted therapy, bone marrow transplantation, rehabilitation and counselling services), palliative care (oral morphine, other opioids and analgesics, adjuvant drugs, symptomatic treatments)
	Systems and establishments to render the above services (comprehensive cancer centres, specialised centralised services such as paediatric oncology services, oncology units in district and provincial hospitals, community cancer centres, cancer screening units, rural extension services for follow-up care in remote areas, palliative care units, palliative care teams, home care and community palliative care networks)
Health information initiatives and systems such as risk factor surveys, population based cancer registries, hospital cancer registries, medical records departments, screening programme and health insurance databases and death registers	To quantify cancer burden to facilitate planning cancer services
	To evaluate effectiveness of cancer control activities by monitoring trends in risk factor prevalence, trends in cancer incidence, survival and mortality

1.4 Description of the national situation of cervical screening in Western Asia and Middle East Arab Muslim Countries

None of the Asian Arab Muslim countries currently has a National Organized Cervical Cancer Screening (NOCCS) programme, however opportunistic screening using the smear test is practiced everywhere (Sancho-Garnier *et al.*, 2013). Due to an availability of data on screening organization in most of WAMEMs, I will report data in only those few countries where it is available.

In Lebanon, with around 90 reported cases of CC per year compared to 1700 breast cancer cases annually, screening for cervical cancer remains a low priority (Sancho-Garnier *et al.*, 2013). In the absence of a national screening policy, cervical cancer detection relies mainly on opportunistic screening practiced to a limited extent in the public and private sectors, with several non-governmental organizations and other politically and religiously affiliated clinics offering cytological screening. The majority of the Lebanese physicians perform yearly smear tests but many gynaecologists perform smear tests only on symptomatic patients. The estimated total number of smear tests performed annually is around 60,000 smears. There are at least 27 cytology laboratories spread over the Lebanon province but almost half of all the smears are performed by two private laboratories (El - Jardali *et al.*, 2013). There are no national unified guidelines for the management (El - Jardali *et al.*, 2013) of abnormal smear tests, most enhanced medical centres follow the latest 2009 American Society of Colposcopy and Cervical Pathology guidelines. There are no national policies for quality assurance, however the largest laboratories and the ones confederated with the university medical centres follow a quality assurance programme authorized by international society (Sancho-Garnier *et al.*, 2013). Latterly, a major campaign was organized for the education of both physicians and patients on the importance of the prevention of

cervical cancers, scheme of the screening conditions (age, frequency) and the quality assurance in the cytologic laboratories. Additionally, a few laboratories have started offering HPV testing (Karam *et al.*, 2005).

Kuwait has no national cervical cancer screening programme, however opportunistic screening is carried out in public and private clinics (Al Sairafi and Mohamed, 2009). In Saudi Arabia, opportunistic screening is offered to married women (Sait, 2011). Data from the Omani Ministry of Health indicate that 73% of women aged 20-69 years undergo cervical cancer screening; however this number may not have been accurate due to multiple screening undertaken by the same women (Sancho-Garnier *et al.*, 2013)

The overall cervical cancer incidence and mortality rates in the Arab Gulf Countries (Bahrain, Kuwait, Qatar, Saudi Arabia, Sultanate of Oman, and United Arab Emirates) are relatively low, but considering the advanced stage at diagnosis, these data are probably underestimated in the absence of population based mortality rates (Sancho-Garnier *et al.*, 2013).

In Iraq, data on the incidence and prevalence of cervical cancer is limited. Furthermore, a national cervical cancer screening programme is yet to be established (Table 1-6). Although it is universally acknowledged that there are considerable barriers to establishing and maintaining cervical screening programmes, particularly in developing countries (Ansink, 2007) there are additional potential barriers to setting up cervical screening in Iraq; these barriers can be related to the social, political, economic, and cultural contexts of a specific programme. After decades of war, sanctions, and occupation, Iraq's health services are struggling to regain lost momentum. The cycle of violence continues during and after conflicts; a further instance of this is that primary healthcare facilities, where preventative healthcare such as cervical screening should be located, are limited in addition to the generally restricted cancer diagnostic, treatment

and palliative care services (Salvage, 2004). It should be noted that there is a lack of evidence on country-specific barriers and I was not able to identify any previous studies identifying barriers to regular cervical screening among women in Iraq. The success of cervical cancer screening programme depends on having sufficient number of personnel to perform the screening tests and on the availability of facilities where staff can undertake subsequent diagnosis, treatment and follow up (World Health Organization, 2002).

Table1-5 World Health Organization (2002) report on cancer screening in Iraq

Cancer Screening and Early Detection	
Cervical cancer	
Cervical cytology (PAP)	Not generally available at the public primary health care level
Acetic acid visualization (VIA)	Not generally available at the public primary health care level
Breast cancer	
Breast palpation /clinical breast exam (CBE)	Generally available at the public primary health care level
Mammogram	Not generally available at the public primary care level

It is evident that a national population based and organized cervical cancer screening programme has not been established in most WAMEMs, the main barrier is lack of evidence based data which resulted in lack of health policy makers’ understanding to support this public health programme and to provide the fundamental resources (Sankaranarayanan *et al.*, 2014).

There are numerous factors that should be taken in account when the establishment of any screening programme technique is being considered, these include: sensitivity, specificity, positive predictive value, negative predictive value and acceptability (Table 1-7) (World Health Organization, 2017a)

Table 1-6 Parameters of screening test World Health Organization (2017a)

Sensitivity	The effectiveness of a test in detecting a cancer in those who have the disease
Specificity	The proportion to which a test gives negative results in those that are free of the disease
Positive predictive value	The proportion to which subjects have the disease in those that give a positive test result
Negative predictive value	The proportion to which subjects are free of the disease in those that give a negative test result
Acceptability	The proportion to which those for whom the test is designed agree to be tested

According to the National Cancer Screening Programme (NCCP), a public health programme designed to reduce the number of cancer cases and deaths and enhance the quality of life of cancer patients, a screening programme should be systematic to ensure it involves the majority of the target group to be screened and that those individuals in whom abnormalities are observed are given appropriate diagnosis and treatment. Also, there should be agreement on guidelines to be applied with reference to the planned screening activities (Table 1-8) (World Health Organization, 2017a)

Table 1-7 Screening planning activities World Health Organization (2017a)

The frequency of screening and ages at which screening should be performed	
Quality control system for the screening test	
Defined mechanisms for referral and treatment of the abnormalities	
An information system	Send out invitations
	Recall
	Follow up of identified abnormalities
	Monitor and evaluate the programme

The World Health Organization (WHO) stepwise framework for establishing a successful an organized population –based cervical cancer screening programme consists of three steps (Table 1-9) followed by three phases of implementation (Table 1-10) (World Health Organization , 2017a).

Table 1-8 World Health Organization (2017a) stepwise frameworks

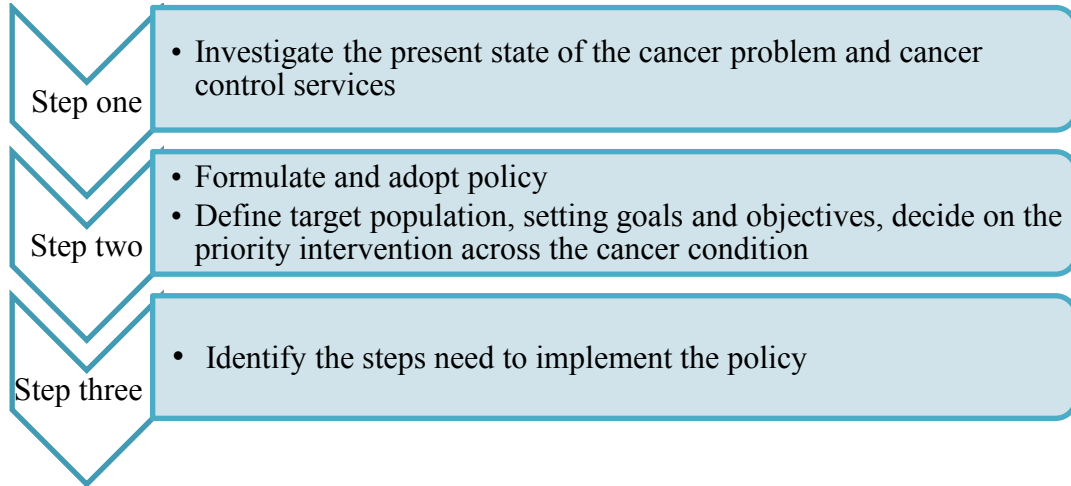
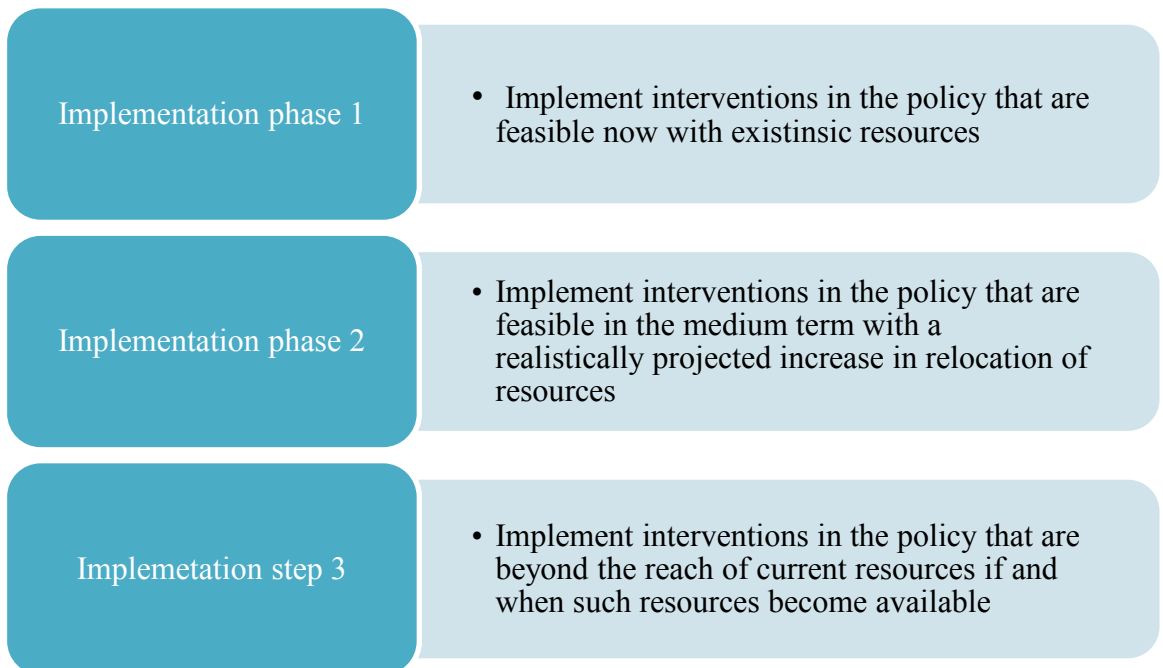


Table 1-9 WHO implementation phase (World Health Organization , 2017a)



1.5 Aim and objectives of the study

In the absence of cervical cancer screening programme in Iraq, a study is needed to investigate the current cervical cancer prevention situation in Kirkuk, Iraq.

The overall aim is to provide evidence-based strategies to establish population based cervical cancer screening services in Iraq.

The specific objectives are

- 1- To explore current cervical cancer preventive services in Kirkuk
- 2- To investigate practical challenges facing health care professionals in order to establish a population-based cervical cancer screening programme
- 3- To assess knowledge and practice of gynaecologists regarding a cervical cancer screening programme
- 4- To explore women's knowledge of cervical cancer and cervical cancer screening
- 5- To find out the factors that have impact women's access to cervical cancer prevention services
- 6- To introduce and evaluate a training programme for health care professionals

1.6 Study design

1.6.1 Study area

Kirkuk province is a governorate in the northern Iraq, 236 kilometres (147 mi) north of Baghdad, and 83 kilometres (52 miles) south of Erbil. In 2011, the estimated population was 1,395,614 people. Kirkuk is in a unique situation due to demographic changes over the centuries in Iraq and has a varied population of Kurdish, Arabic and Turkmen ethnicities and Muslim and Christian faiths (Quiñones *et al.*, 2013)

Map of Kirkuk governorate (Quiñones *et al.*, 2013)



1.6.2 Organisation and Overview of Thesis

A mixed method research design was used to address the aim of the study. Combining methods from qualitative and quantitative research can enhance the reliability, validity and trustworthiness of a research study (Moule and Goodman, 2014). Bryman (2000) suggests that mixed methods research can be used to different stages of healthcare studies to address the aims of the researcher and access the perspectives of participants. To answer the research question I considered that a combination of methods would be desirable.

This doctoral thesis is presented in three phases (Figure 1-12): -

Preliminary study: I conducted a preliminary study at the Cervical Cancer Screening Unit in Azady Hospital, Kirkuk City; 25 women aged between 18-65 years who attended to their appointment for a smear test were interviewed in order to explore the difficulties they face in accessing cervical cancer screening. Also, gynaecologists working in

cervical cancer screening units were interviewed to identify the situation regarding the cervical cancer prevention services they provide to reduce the burden of advanced CC along with the challenges facing healthcare professionals for establishing a successful cervical cancer screening programme. The discussions with the gynaecologists identified that, in her view, one of the major barriers is that the smear test is not available in the local health care centres and that the current opportunistic screening programme is not effective in reaching the majority of the population.

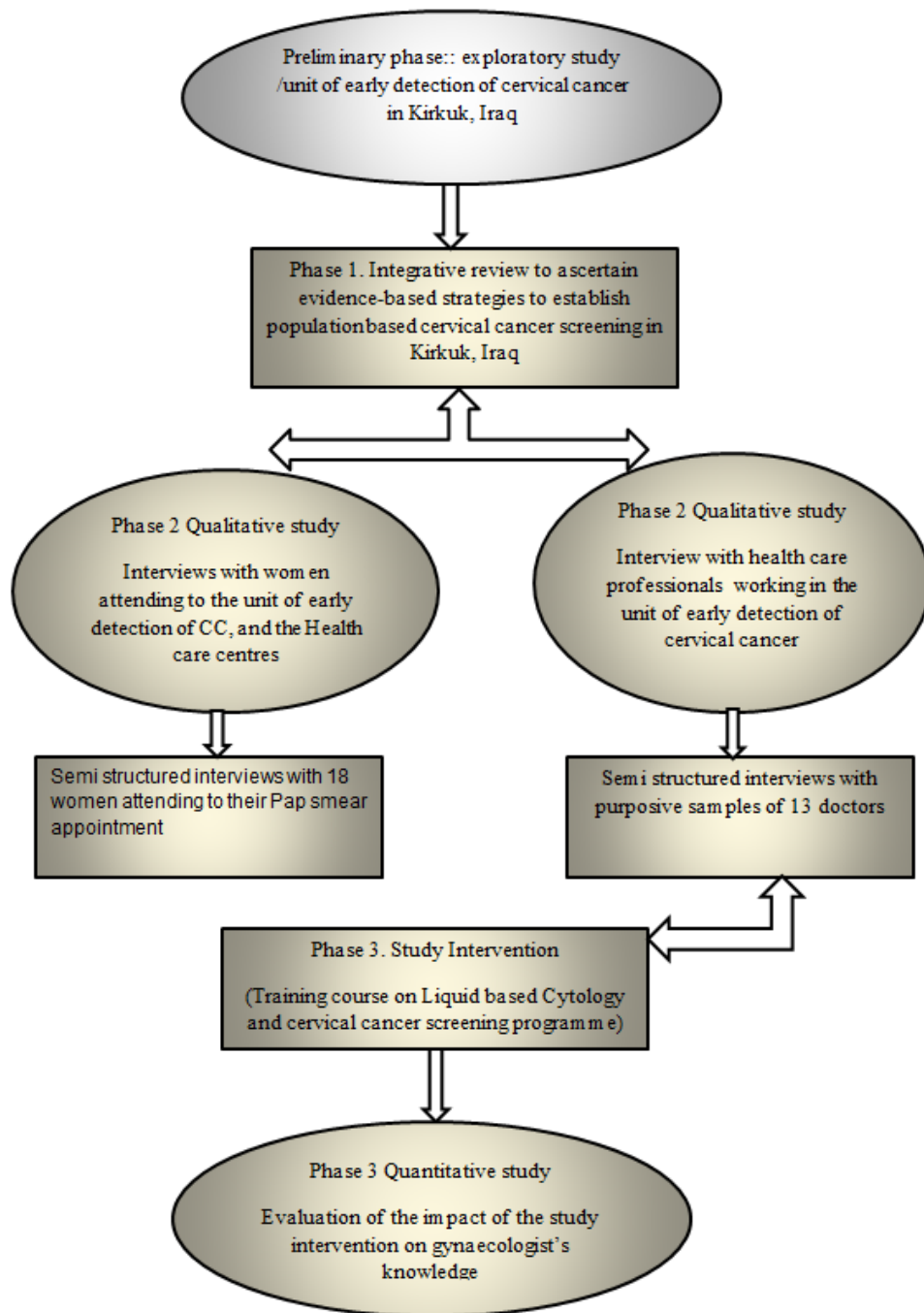
Phase one: As I could not identify any previous studies that had undertaken to explore cervical cancer screening among Iraqi women, I undertook a systematic review of the current literature related to my thesis in the relevant Muslim countries. The aim of the review was to identify and assess evidence-based strategies to establish cervical screening programmes in the predominantly Muslim Arab countries. Thirteen studies from the Western Asia and Middle East Arab Muslim countries were included in the systematic review; the result of this review and discussion of those results are presented in Chapter Three.

Phase two: Based on the literature reviews and reflection on the outcome of the initial study I conducted a qualitative grounded theory study, using a semi structured interviews with a purposive samples of 13 doctors to identify the barriers and practical challenges facing healthcare professionals working in cervical cancer screening units. Additionally, I interviewed a convenience sample of 18 women attending to their appointment for a smear test in the unit of early detection of cervical cancer screening and those who visited health care centres in order to assess women's knowledge of cervical cancer and cervical cancer screening.

Phase three: In this phase I implemented and evaluated an intervention, which was a cervical cancer screening comprehensive training course. I used the findings of phase three, which indicated there was both a lack of knowledge and practical challenges

facing healthcare professionals working in cervical cancer screening units to identify key messages from which the interventions programme was developed. Further, I performed a quantitative study using a pre- and post- intervention questionnaire based on previous literature to assess the knowledge of the participants on the cervical cancer screening programme and to investigate the impact of the intervention on the participants. The data obtained were analysed using McNemar's test.

Figure 1-7 A flow chart of the study approach



1.7 Structure of the thesis

This thesis consist of six chapters

The outline for chapter one (introduction and background) has been presented earlier.

In the second chapter, I describe and justify the method chosen to address the research questions. The material includes the study population, data collection, analysis and the ethical considerations for this study.

The focus of chapter three is the systematic review on the interventions that have been implemented to increase the uptake of cervical cancer screening in Western Asia and Middle East Arab countries. In this review, I identify factors that have had an impact on the access of Western Asia Middle East Arab Muslim women to cervical cancer screening services.

Chapter four: I present the qualitative data derived from, semi-structured interviews with 13 doctors and 18 women; I discuss the key information identified from the data analysis

In Chapter five: I present the study intervention, a comprehensive training course on cervical cancer screening programme. This chapter also includes results and discussion of the quantitative study used to assess the intervention.

Chapter six: I present the theoretical considerations relevant to cervical screening practices and discuss the application of the Health Belief Model in the general discussion, critique of the study, implication of practice and implications for further research.

1.8 Conclusion

To summarise in this chapter I have described the burden of CC globally and in Iraq. I have also discussed the cervical cancer screening programme in the UK and Ireland with a focus on the criteria for their establishment along with the World Health Organization's stepwise approach for a successful, organized population-based screening programme. In addition to explaining the rationale for conducting this doctoral study I have given a brief overview of the thesis.

In the next chapter I will discuss the mixed method approach and the sequential explanatory design that I have adopted to conduct this doctoral thesis.

Chapter Two

Materials and Methods

2.1 Introduction

In this chapter I will present the methods chosen to undertake this doctoral programme of research. I will describe the study design; discuss the choice of the mixed methods approach for this study, provide a background to the choice of qualitative research methods and discuss the grounded theory method. Given the above, I will present the processes followed, including preparation and evaluation of the study intervention, participant recruitment and relevant ethical issues.

2.2 Study Design

I have adopted a mixed methods research design to address the aim of the study. Combining methods from qualitative and quantitative research can enhance the reliability, validity and trustworthiness of a research study (Moule and Goodman, 2014). Bryman (2000) suggests that mixed methods research can be used to access the perspectives of both the researcher and participant, therefore a mixed method design is often used in health settings to address a research question connected to improving quality of patient care (Bryman, 2000). Using mixed methods has the potential to strengthen the weaknesses of both approaches and can be powerful when addressing complex issues such as health services interventions (Tariq and Woodman, 2013)

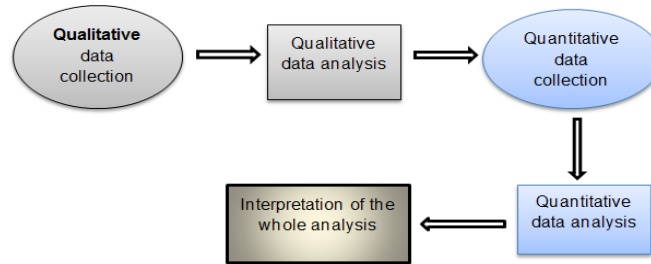
Mixed method research is a systematic approach to addressing research questions that involve collecting, analysing and synthesising both qualitative and quantitative data in

single research projects (Andrew and Halcomb, 2009, Tariq and Woodman, 2013). This method of research began among anthropologists and sociologists in the early 1960s, the term of “triangulation” began to enter methodology conversations in the late 1970s (Morse, 1991). Triangulation was identified as a combination of methodologies in the same study of the same phenomenon to reduce the bias associated with using one particular method (Morse, 1991). The use of mixed methods has continued to grow in popularity. A recent innovation in mixed methods research is the mixed method systematic review, which enables systematic appraisal of both quantitative and qualitative literature on a subject area and then synthesis of the findings (Tariq and Woodman, 2013).

Even though there are various designs to consider for mixed methods research, the four major types of this method currently used are; triangular design, embedded design, explanatory design and exploratory design (Creswell and Clark, 2007).

To explore factors associated with a cervical cancer screening programme in Kirkuk, Iraq, and based on the preliminary study that I had carried out and after considering all the above approaches, a sequential exploratory mixed method was chosen, where the qualitative data are collected and analysed first, followed by collection and analysis of quantitative data (Creswell *et al.*, 2003b). The results of these two phases were then integrated during the interpretation phase (Figure2-1). The initial focus of this design is to investigate a phenomenon (Creswell *et al.*, 2003b).

Figure 2-1 Sequential exploratory design taken from Creswell *et al.* (2003b)



The word exploratory is often associated with qualitative research, while the word factors suggest the use of variables in quantitative research (Creswell *et al.*, 2003a). The primary strength of qualitative research is its focus on the meaning of human experience for the purpose of inductive or theory development driven research (Creswell *et al.*, 2011). Quantitative research, which has the potential to provide measurable evidence, is mainly deductive and often used when the aim is to test a theory or hypothesis, examine a relationships among variables or presenting descriptive information (Creswell *et al.*, 2011). I chose this design because this enabled deep observation of the situation where there was very little known about the research topic. Qualitative research is an appropriate pattern to adopt when a little is known about the topic (Morse and Field, 1996) and due to limited data on the cervical cancer screening programme in Iraq, I was not able to identify previous research concerning access to cervical screening in this context. I considered the grounded theory (GT) study to be appropriate for the qualitative phase, as grounded theory starts with a set of observations in respect of a particular situation and moves to the generation of theories (Moule and Goodman, 2014). Grounded theory is a method that is used primarily to generate a theory (DePoy and Gitlin, 2016). The researcher starts with a broad query in a specific topic area and then collects relevant information about the topic. As the process of data collection

continues, each piece of information is reviewed, compared and contrasted with other information. From this constant comparison process, diversities and commonalties among categories become clear and eventually a theory that explains observations is inductively developed (DePoy and Gitlin, 2016). As classic grounded theory aims for conceptual understanding of social behaviour, rather than the constructivist focus on interpretive understanding of participants meanings (Charmaz, 2003), this was thought to be appropriate to use in the qualitative phase of the study. All findings were used to construct the final theoretical model described in the final chapter of this doctoral study.

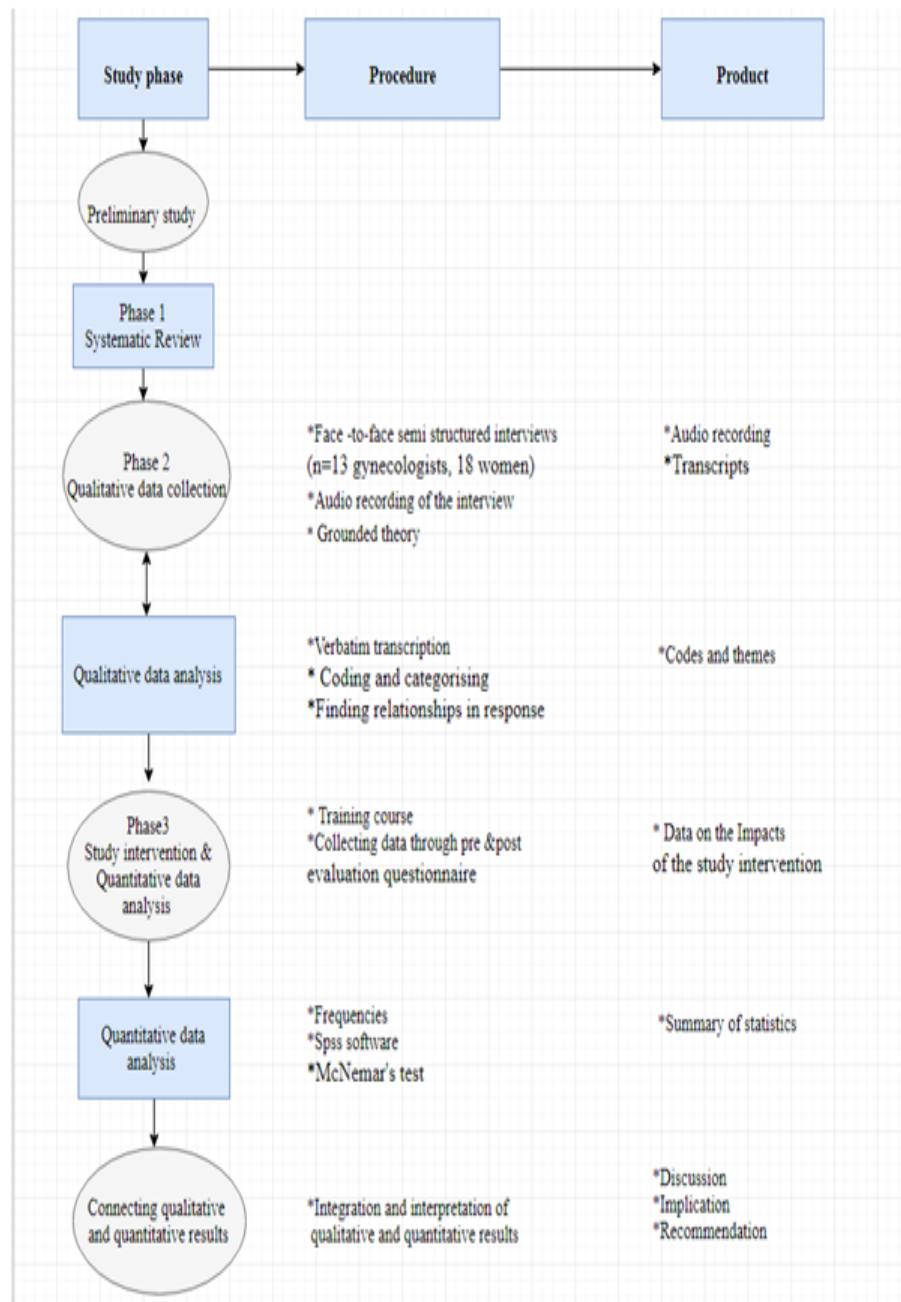
This dissertation comprised three phases. Initially, I conducted a preliminary study in which I interviewed a number of women and health care professionals to provide a comprehensive background regarding the cervical cancer screening programme in order to obtain baseline information on CC screening status and determinants of CC screening in Kirkuk, Iraq. Furthermore, in phase one of the study, due to unavailability of an organised population-based cervical screening programme in Iraq, a systematic review was undertaken involving countries within the same geographical region of Iraq, those Arab countries situated in Western Asia and the Middle East (see chapter 3, Ali *et al.*, 2017 Appendix G). This focussed on studies exploring the factors which have had an impact on the uptake of cervical cancer screening among Muslim women living predominantly in Arab Muslim countries, as well as identifying the interventions that have been implemented in those countries to improve the CC screening services.

In phase two, I conducted a qualitative study and carried out semi-structured interviews with 18 women attending for smear tests, to identify factors that had an impact on their access to cervical cancer screening investigations. The findings from the semi-structured interviews with the women informed further interviews with the health care professionals to explore the practical challenges they faced in terms of cervical cancer screening programme. Hence, I conducted semi-structured interviews with

gynaecologists (n=13) working in hospitals or medical health centres. Further, the findings from the qualitative approach helped to identify the gap in knowledge among the gynaecologists and informed the development of educational intervention (phase three). A professional training course in cervical screening was undertaken by the researcher in collaboration with the Birmingham City University (BCU) and Birmingham Women's Hospital. Subsequently, permission was obtained from the coordinator of the introductory training course on cervical cancer screening in Birmingham City University and Birmingham Women's Hospital to use their resources, along with the knowledge and skills acquired during the training, in order to implement the study intervention. This comprised a comprehensive training course on the cervical screening programme delivered to the gynaecologists and nurses working in the hospitals and medical health centres in Kirkuk.

To evaluate the impact of the Kirkuk study intervention (educational course), the researcher conducted a quantitative study (phase three) on the health care professionals who participated in the educational elements of the programme. A flow chart representation of the study phases and mixed methods sequential exploratory design that was used for this research study (Creswell *et al.*, 2011) is represented in Figure 2-2

Figure 2-2 Flow chart demonstrating phases of the mixed methods study



I will now present the methods used in each phase of the project in detail.

2.3 Preliminary exploratory study

2.3.1 Design

I conducted a preliminary exploratory study to obtain a detailed description of women's concepts of cervical cancer, how they became aware of the screening activities and to determine the factors that influence women's access to cervical cancer preventative services, in Kirkuk, Iraq. The preliminary study was a cross-sectional survey involving semi-structured interviews, which was administered by me in person. Semi-structured interviews provide probabilities to address specific questions, while leaving space for participants to offer new meanings to the study focus (Galletta, 2013) and are suitable for the exploration of the views, beliefs, values and motives of individuals (Louise Barriball and While, 1994). I developed a semi-structured questionnaire comprising both closed and open questions. This was based on the initial literature review and consisted of three sections (Tables 2-1, 2-2, 2-3). These were:

1. Socio-demographic characteristics
2. Knowledge of cervical cancer and the smear test
3. Knowledge and awareness of the risk factors for cervical cancer

Table 2-1 Demographic characteristics collected in preliminary phase

➤ **Age**

>20

20-29

30-39

40-49

>50

➤ **Level of Education**

Not attended to School

Primary school graduated

Secondary school

graduated

Diploma

University or above

➤ **Number of children**

Non

1

2

3

≥4

Table 2-2 Women’s knowledge and awareness of cervical cancer and the Smear test

Items	Yes	No
1. Have you heard about ‘smear test’?		
2. Why is the smear test done?		
3. Where do you think women would prefer to go for their smear tests?		
4. Ever had Smear test ? How many times?	<input type="text"/>	<input type="checkbox"/>
5. What made you to have a Smear test ?		
a) Doctor suggestion	<input type="checkbox"/>	<input type="checkbox"/>
b) To discover any cervical change	<input type="checkbox"/>	<input type="checkbox"/>
c) To early detection of cervical cancer	<input type="checkbox"/>	<input type="checkbox"/>
d) To treat cervical inflammation	<input type="checkbox"/>	<input type="checkbox"/>
e) Relatives advised	<input type="checkbox"/>	<input type="checkbox"/>
Others		

Table 2- 3 Women’s knowledge and awareness of the risk factors for cervical cancer

Items	Yes	No
➤ This is a question about cancer in the cervix, which some women get. By the way, there is no reason to think you have this, this is something we are asking everyone in our study.		
1- Have you heard of this?	<input type="checkbox"/>	<input type="checkbox"/>
2- What would make one woman more likely to get cervical cancer than another?		
3. Have you heard of anything that could increase the chance of a women getting cervical cancer?	<input type="checkbox"/>	<input type="checkbox"/>
a) Multiple sexual partners	<input type="checkbox"/>	<input type="checkbox"/>
b) Having a /family history of cancer	<input type="checkbox"/>	<input type="checkbox"/>
c) Early initiation of sex	<input type="checkbox"/>	<input type="checkbox"/>
d) Contraceptive method	<input type="checkbox"/>	<input type="checkbox"/>
e) HPV	<input type="checkbox"/>	<input type="checkbox"/>
f) Smoking	<input type="checkbox"/>	<input type="checkbox"/>
g) Multiple childbirth	<input type="checkbox"/>	<input type="checkbox"/>
h) Chemical or other substances applied to the genital area	<input type="checkbox"/>	<input type="checkbox"/>
Others		

Also, I developed an unstructured questionnaire (Oppenheim, 2000) Table 2-4 made up of questions to elicit free responses and aimed at guided conversations with the health care professionals (one gynaecologist and one nurse) working in the unit of early detection of cervical cancer in a hospital in Kirkuk, Iraq.

Table 2- 4 Open ended question related to health system barriers face health care professionals

1) Can you tell me about your role here in the hospital?

2) Do you see patients with cervical cancer?

3) What are the cervical cancer preventative services you offer to women?

4) What are the practical challenges you face in order to establish a regular cervical cancer screening programme?

2.3.2 Data collection

2.3.2.1 Recruitment

Recruitment of the participants took place in the unit of early detection of cervical cancer, Kirkuk. Participants involved women attending for their appointments to uptake a smear test and doctors and nurses working at this unit. Firstly, I met the health care staff working at this unit to explain my research project and the objectives of the study. The researcher was known to the gynaecologist and nurses working in this unit as a PhD candidate in the UK with past experience as a lecturer at the School of Nursing/ Kirkuk University. My background as a nurse and awareness of the policy of healthcare services delivery in Kirkuk/Iraq added further credibility to the data collection process. Due to the organisational planning of this unit, smear tests were performed on only two days per week so I presented to the unit on those specified days. I used the interview

schedule to obtain responses from women attending for their smear test appointment at the unit of early detection of cervical cancer.

I adopted a purposive sampling technique (Doorenbos, 2014) and decided what needed to be known and set out to find participants who could and were willing to provide information on cervical cancer screening, based on their knowledge and experiences. This nonrandomised technique involved identification and selection of individuals that were well-informed about the phenomenon of interest. Accordingly, I met every woman attending to have a smear test at the unit on those specified days, and explained the research project and asked her if she would like to participate. Participants were reassured that they could withdraw from participating at any time during the interview. Informed consent was obtained verbally from 25 married women aged between 18-65 years. Throughout the interviews women were encouraged to identify their feelings and express their understanding of the questionnaire. Language is a means through which cultural norms and values are communicated (Olubunmi *et al.*, 2014). The interviews were therefore conducted between June and August 2014 in one of three local city languages, according to the participant's choice, and then translated by the researcher into English. Admittedly, the researcher's background as an Iraqi-born female who was therefore familiar with all local languages played an important role in the data collection process.

Anonymity of participants was protected by assigning pseudonyms and identifying material was removed.

2.3.2 Data analysis

Due to the small number of participants and the fact that most of the women had no or very little awareness of cervical cancer and cervical cancer screening, it was not appropriate to analyze the data using descriptive statistics for the closed questions in

the questionnaire (Lancaster *et al.*, 2004). However, themes that emerged from the open questions were used to inform the design of the questionnaire for use in the mixed method study.

2.3.4 Outcomes of the exploratory study

The major reason for conducting a preliminary study was to determine initial data for the primary outcome measures. This ensured that the questions were well defined, clearly understood and presented in a consistent manner. Further, the purpose of this preliminary study was to identify the barriers that may be encountered during the study process and to consider the time required for data collection by investigating how much time women needed to answer the questions. The first few participants during the preliminary study experienced difficulties in responding to some of the questions such as ‘Have you heard about smear test ’ because most of the participants did not know what the term smear test meant. So, the question was reworded to ‘What do you understand by the term of smear test?’ As most of the participants did not understand the word smear test, they were asked about the local name for smear testing in their language. Therefore in some cases ‘smear test’ was reworded as the ‘investigation of the cervix’. It was clear that not every word had the same meaning to every respondent (Louise Barriball and While, 1994), so the opportunity to change the words but not the meaning of the questions was important. In this type of interview, the trustworthiness depends upon transmitting the equality of the meaning, which helps to standardize semi-structured interviews (Louise Barriball and While, 1994). This preliminary study revealed a high acceptance of cervical screening among respondents. Accordingly, further data collection was conducted and resulted in exploring the participant’s perspectives in depth.

A gynaecologist and a nurse working in cervical cancer screening unit were also interviewed to identify the barriers healthcare professionals face for establishing a successful cervical cancer screening programme. The discussions with the gynaecologist identified that one of the major barriers is that the smear test was not available in the local health care centres and that the current screening programme was not effective in reaching the majority of the population. Furthermore, she confirmed the great need to influence women's health care providers to highlight the need for smear tests and to develop educational programmes targeting women and health care workers. The aim of these steps was to provide better preventive and direct care for women and to reduce the burden posed by advanced cervical cancer on the Iraqi health care system as a whole. This preliminary study informed the framework for the phase two (qualitative study) interviews questions and guided me to develop questions that eliminated ambiguity.

2.4 Phase one: systematic review

In this section I will provide an overview of the methods used for producing the systematic review.

A systematic review is a summary of the research literature that is focused on a single question (CDR, 2009). It is conducted in a manner that enables the researcher to identify, select, and synthesize all high quality research evidence relevant to that question (Bettany-Saltikov, 2012). A systematic review was undertaken based on the Centre for Review and Dissemination (CRD) guidance for undertaking reviews in health care of the available evidence in management (CDR, 2009) to assimilate 'best evidence' to answer the question 'What are the factors that affect cervical cancer screening uptake among Arab Muslim Women?'. I investigated the interventions that

have been implemented to increase cervical cancer screening uptake, as this evidence might be particularly useful in considering implementation of an intervention strategy to address cancer screening uptake.

I conducted this review to evaluate evidence-based strategies in relevant countries that might help to inform health care policy to facilitate the establishment of population – based cervical cancer screening in Iraq. As both qualitative and quantitative evidence was thought to be relevant, this was an integrative review (Moule and Goodman, 2014).

The research questions for the integrative review were:

- ✚ What are the factors that have had impact on the cervical cancer screening uptake among Arab Muslim Women (AMW) living predominantly in Arab Muslim countries?
- ✚ What are the interventions that have been implemented in Arab Muslim countries to increase the uptake of Smear test among women?
- ✚ What evidence based strategies have been implemented in Arab Muslim countries for the purpose of early detection of cervical cancer?

2.4.1 Literature search strategy

The key questions above guided the preliminary review of literature. The review was based on established guidance for undertaking reviews in health care by CRD, (2009). The review focused upon the interventions already implemented to increase cervical cancer screening uptake, considering all factors relating to intervention strategies for cervical cancer screening in Western Asia Middle East Arab countries published in English language from January 2002- December 2017.

2.4.2 Data sources

Five relevant databases were searched:

 CINAHL

 AMED

 MEDLINE

 SCOPUS

 GOOGLE SCHOLAR

The search strategy for the database CINAHL is presented in Table 2-5.

Table 2-5 Print Search History

#	Query	Limiters/Expanders	Last Run Via	Results
S4	TX Oman OR TX Bahrain OR TX Yemen) AND (S1)) AND(S1 AND S2)) AND (S2 AND S2)) AND (S2 AND S2)) AND (S2 AND S2) AND (S1 AND S3)	Search modes- Boolean/Phrase	Interface-EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	14
S3	(TX Oman OR TX Bahrain OR TX Yemen) AND (S1)) AND (S1 AND S2)) AND (S2 AND S2)) AND (S2 AND S2)) AND (S2 AND S2)	Search modes- Boolean/Phrase	Interface-EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	14
S2	TX Oman OR TX Bahrain OR TX Yemen	Limiters -Published Date: 20020101-20170131; English Language Search modes - Boolean/Phrase	Interface-EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	4,347
S1	TX cervical screening OR TX Pap* smear	Limiters -Published Date: 20020101-20170131; English Language Search modes - Boolean/Phrase	Interface-EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	8,019

2.4.3 Inclusion and exclusion criteria

Papers were considered for inclusion if they:

1. Were based on research studies undertaken using any research method
2. Focused on cervical screening in Western Asia and Middle East Arab Muslim countries
3. Included data on barriers or factors affecting uptake of cervical screening.

Papers were excluded if they were:

1. Focusing on laboratory testing.
2. Reported data on AMW living outside the regions that were the focus of this review.

2.4.4 Keyword searches

Keyword searches centred on ('cervical screening' OR 'Pap*smear') AND (Arab OR Muslim OR Iraq OR Kurdistan OR Jordan OR Qatar OR Saudi Arabia OR Kuwait OR United Arab Emirates OR Lebanon OR Syria OR Palestine OR Oman OR Bahrain OR Yemen) were used as the primary terms. When searching a Google scholar, I also added the term 'barriers'.

2.4.5 Studies selection

I reviewed the titles and abstracts of the articles identified and excluded those that did not meet the eligibility criteria. Papers were excluded if the title or abstracts were not focussed on the review topic or were literature or laboratory based. To ensure the reliability of this process, one of my supervisors independently undertook the same assessment. Any disagreements were resolved by reviewing the full article then making the final decision through a process of consensus.

2.4.6 Search outcome

The initial search revealed 621 articles: 78 duplicates were removed. After reviews of the titles and abstracts, 526 further articles were excluded. Seventeen papers were assessed as potentially relevant. Four were related to general gynaecological cancer services in Arab countries and general cancer control in the Gulf and did not include reports of empirical research. This left 13 papers for inclusion in the integrative review.

2.4.7 Quality appraisal

I undertook a quality appraisal of the twelve selected quantitative studies and the single qualitative study using QualSyst, the standard quality assessment criteria for evaluating original research papers from a variety of fields (Kmet *et al.*, 2004). Fourteen questions were used to appraise the methodological quality of each quantitative study, and 10 for the qualitative study. A supervisor independently appraised the papers and assigned scores. We then met to discuss our scoring and any disagreement about assessment of papers was discussed until consensus was reached.

2.4.8 Data analysis

Twelve out of the thirteen included studies utilized quantitative methods and one was based on a qualitative design. Due to disparity in design, study populations and research focus, it was not appropriate to conduct a meta-analysis. Therefore, we used the guidance on analysis of diverse studies to produce an integrative review (2005). We made a narrative summary of the findings of each paper and presented this in a table (see Chapter three). Two researchers then independently explored each paper for relevant results or findings, using the process of Thematic Analysis (Braun and Clarke, 2006). The results were then presented in a narrative form.

2.5 Phase two: Qualitative study

2.5.1 Research design

Qualitative research is most commonly concerned with the systematic collection, ordering, description and interpretation of textual data generated from talk, observation or documentation (Kitto *et al.*, 2008). The desired outcome of the qualitative research is to make conceptual generalisation from the local context of the qualitative study (Kitto *et al.*, 2008).

With qualitative data analysis, a wide range of words generated from interviews or observational data needs to be described and summarised. The study question may require the researcher to explore the relationships between several themes that have been identified, or to relate behaviour to demographic characteristics (such as gender or age) of respondents. This may enable implications for policy or practice to be derived from the data (Lacey and Luff, 2001).

Methods for undertaking qualitative data analysis can be divided into three categories (Smith and Firth, 2011):-

- ✚ Socio-linguistic methods that explore the use and meaning of language such as discourse and conversation analysis
- ✚ Methods that focus on developing the theory, characterised by grounded theory
- ✚ Methods that describe and interpret participants' views, such as thematic analysis.

Regardless of the diverse range of qualitative methods, data are often obtained through participant interviews (Kitto *et al.*, 2008). The ensuing analysis is based on a common set of principles; transcribing the interviews, engaging within the data to obtain detailed insights of the phenomena being explored, developing a data coding system and linking of data to form categories and/or themes, which may lead to the development of theory (Kitto *et al.*, 2008).

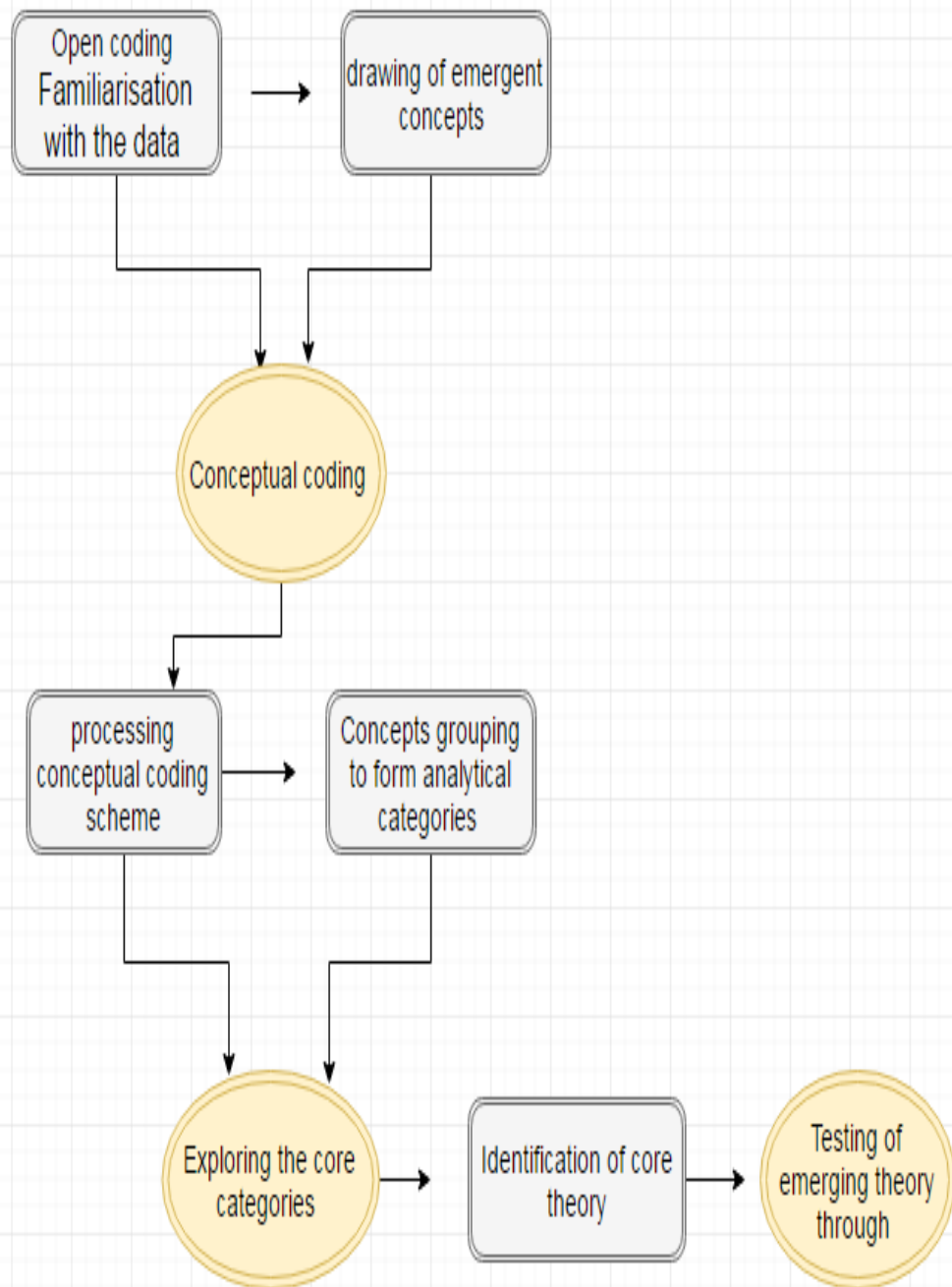
Two distinct approaches often used in qualitative analysis in health related studies are thematic analysis and grounded theory (Antaki, 2008). Thematic analysis was distinctly developed in circumstances of applied policy research to meet specific information needs or to provide outcomes and recommendations, often within a short time (Antaki, 2008). Thematic analysis can provide rich understanding of complicated phenomena that can be applied across extent theoretical and epistemological approaches and expands the existing theory (Braun and Clarke, 2006). However, this method of analysis has been criticised for being subjective and lacking transparency, lacking depth, and disintegrating the situation being studied: as a consequence judging the rigour of the findings might be difficult (Smith and Firth, 2011). Despite the fact that the general

approach in thematic analysis is inductive, this form of analysis allows for the inclusion of a priority topic as well as emergent concepts (Lacey and Luff, 2001).

Given all the above and after consideration of all approaches, I adopted grounded theory, since it is consistent with using a broad research question that identifies the general area to be studied (Corbin and Strauss, 2008). Grounded theory was developed by sociologists Glaser and Strauss (1967). This theory derives from relationships emerging from sets of concepts which are directly delivered from the data analysis (Glaser and Strauss, 1967). In this approach concepts or categories emerging from one stage of the data analysis are compared with concepts emerging from the next (Figure 2-3), (Lacey and Luff, 2001). The researcher looks for the relationships between concepts and categories through constantly comparing them, this process continues until the researcher reaches what called 'theoretical saturation' which means no new significant concepts and categories are emerging (Corbin and Strauss, 2008).

I chose this approach because it enabled deep investigation and exploration of the topic. The strength of qualitative research is the ability to provide complex textual descriptions of how people experience a certain topic and can help a better understanding to interpret the reality of a given situation (Creswell and Clark, 2007).

Figure 2-3 The below figure represents the generic processes within grounded theory analysis, figure from Lacey and Luff (2001)



2.5.2 Qualitative study participants

In the first phase of the qualitative study, the target population was women attending for their smear test appointment in the unit of early detection of cervical cancer in the main hospital in Kirkuk, along with those who were attending obstetric and gynaecologic services in the health care centers.

Women were eligible if they were:

- ✚ Aged 18-65 years inclusive
- ✚ Symptomatic or asymptomatic of cervical cancer
- ✚ Married or unmarried.

In the second phase, the target population was a purposive sample of 13 gynaecologists; all were practitioners who were working in obstetrics and gynaecologic health care services in the main hospitals along with those who were working in the health care centres in Kirkuk.

2.5.3 Ethical Approval

For the purpose of this study an application for ethical approval was submitted to Kirkuk Health Directorate and approval was obtained from Kirkuk Health Directorate [Ref.n1555 in 26/06/2014, (please see Appendix B)]. Also, an ethical application form was submitted to the Ethical Board of the Plymouth University on November 2014, and the study was approved by Ethical Board of the Plymouth University [Ref.n. 14/15-338] (please see Appendix A).

2.5.4 Participants and recruitment

Recruitment for this phase began in May 2015 and ended in September 2015. Participants were recruited from different locations across Kirkuk, Iraq. However, I realised that unmarried women were not seeking any gynaecological services due to the socio-cultural norms in Iraq. I went to the unit of early detection of cervical cancer, Azadi hospital Kirkuk, daily; however smear tests were performed on only two days per week. I also met with the health care providers working at the unit of early detection of cervical cancer to notify them about the research project and to inform them that ethical approval had been obtained from the Kirkuk Health Directorate authorities. At this stage I responded to specific questions from the health care providers about the research project: afterwards specified days were scheduled for me to meet women attending for their smear test appointments. Ten participants were recruited from the Unit of Early Detection of Cervical Cancer, Azadi hospital, eight from the primary health care centres. Apart from this, I started the recruitment of the doctors and sent an invitation letter (the researcher and the Iraqi supervisor (gynaecologist) to 20 gynaecologist and practitioners. Thirteen doctors accepted my invitation to participate in the study.

2.5.5 Data collection

I carried out semi-structured interviews with all those who agreed to take part in the study. A key benefit of the semi-structured interview is that the researcher can attend to the individual's experiences, while also addressing theoretical issues of interest (Galletta, 2013). Also, face-to-face interviews allow the opportunity to evaluate the validity of the participants' responses by observing non-verbal indicators, which is useful when discussing sensitive subjects (Louise Barriball and While, 1994). For instance, women did not use the word 'cancer' and preferred to say 'that disease', but

the researcher (who shares cultural ties with the participants) hypothesised that women's perspectives of cervical cancer are influenced greatly by the community beliefs, behaviour, and cultural life style.

To enhance understanding of the women's perspectives of cervical cancer and CC early detection through regular screening, and to identify the difficulties they face to access the cervical cancer screening, a semi-structured interview based on an open ended questionnaire guide was adopted (Galletta, 2013). The interview questions were developed after conducting the preliminary study and were reviewed by my supervisors; this helped me to explore the participants' perspectives in depth. Initially, I tried to develop trust with the participants; all participants had been given a full explanation of the methodology and purpose of the project. Additionally, participants were reassured that the purpose of the interview was not to evaluate their knowledge but it was an opportunity to share their opinions, experiences and their perspectives with me.

Interviews were carried out in the Unit of Early Detection of Cervical Cancer and the primary health care centres. The researcher conducted interviews in the language of participants' choice; three local city languages (Arabic, Kurdish, and Turkmen) afterwards transcribed and translated into English. Each interview lasted for approximately 20-30 minutes. Informed consent was obtained verbally from all participants before conducting the interview and all the interviews were digitally recorded. Interview questionnaire involved 13 questions; the first six questions related to cervical cancer, smear test and the interval for regular cervical cancer screening, while four related to the women's access to the smear test. The final question related to suggestions to improve cervical cancer screening behaviour among healthy women.

The guide for the semi-structure interviews was pre-tested through the preliminary phase among 25 participants (who did not form part of the main study) to examine the

clarity of the question. All interviews were conducted by me to ensure that all questions were administered in a standardised way.

In phase two of the qualitative study, a purposive sample of gynaecologists / obstetricians and health care practitioners working in two main hospitals and the health care centres in Kirkuk, Iraq was recruited. A semi-structured questionnaire comprising 13 questions was developed. The first part of the questionnaire involved demographic variables such as job title, qualification, type of cases seen and length and experience, while, the main focus of the second part was questions on cervical cancer, Smear test, cervical cancer screening programme and the barriers to establish organised population based cervical cancer screening programme.

The researcher arranged an appointment with the doctors (via telephone) a day before the interview. Most of the interviews were carried out in the participant's work place in Azadi hospital, Kirkuk, although some of the doctors requested interviews in their private clinics. In-depth interviews were carried out with 13 doctors, to get an understanding of the performance of Smear test among doctors and identify practical difficulties they faced in establishing regular cervical cancer screening in Kirkuk. Informed consent was obtained verbally from all doctors to record the interview through the use of digital recording. The individual interviews lasted for approximately 40-60 minutes. All interviews were conducted and recorded in Arabic and then were transcribed and translated into English. Regardless of the language differences among gynaecologists, all preferred to be interviewed using the Arabic language.

2.5.6 Data analysis

The qualitative data were analysed using the grounded theory approach described by (Strauss and Corbin, 1996). Coding is the basic analytic process used by the researcher

(Walker and Myrick, 2006), transporting data from transcript to theory. Corbin and Strauss (2008) divided the process of coding in to three phases, classing these as open, axial and selective coding. They required the use of the constant comparative process within these phases (Corbin and Strauss, 2008).

In accordance with grounded theory analysis (Corbin and Strauss, 2008), I started the data analysis by creating with verbatim transcriptions of the digital recordings. I listened to all 31 interviews several times in order to gain an overall understanding of the data, while identifying key concepts. I transcribed and translated all 31 interviews into English, after which I started formally coding the data and sent them to one of my supervisors to code independently; the translations were checked by the Iraqi supervisor (gynaecologist)¹. The transcripts were read and re-read to allow full viewing of the data, following this process the transcripts were compared with the digital recordings and data were displayed. In this stage, open coded was conducted by breaking down the data through line by line coding, identifying initial codes from the raw data (Corbin and Strauss, 2008). A constant comparative process of analysis was used in order to drive and label the ideas or themes that emerged. Focusing on the participants' responses to each question, I examined relationships among codes; the common key themes were identified and data were displayed to enable organized examination of similarities among various responses. Patterns of themes identified were grouped into categories. The codes and emerging categories I derived were compared with those of my supervisor (HS)² to ensure the trustworthiness of the findings. The process of recruitments and data analysis were continued until saturation was reached and no new categories were emerging. Finally, the integrated themes were processed into a

¹Dr. Ayla Ghalib: professor of gynaecology and obstetrics , College of Medicine, Kirkuk University

² Heather Skirton: professor of Applied Health Genetics , Faculty of Health and Human Sciences, Plymouth University

preliminary theory that informed the study intervention. The findings of the qualitative study and the discussion will be presented in Chapter Four.

2.5.7 Ethical consideration

Participants were assured of confidentiality and informed that their participation in the study was entirely voluntary. They were advised that they could decline to answer any question or that they could withdraw from the study at any time during the interview. The confidentiality of the participants was protected and their privacy was secured throughout transcription of the interviews and during data analysis. Pseudonyms were given to every participant and these were used in the interview transcripts. All personal details that could be used to identify particular individuals were removed from the data. All voice recorded interviews were stored in a password protected computer allowing access only to the researcher. Printed transcripts were stored in a locked filing cabinet in the researcher's office.

2.5.8 Ensuring rigour

An important aspect of qualitative research involves the consideration of the researcher's social location and engagement in the research process, identifying the influences of the researcher on the study process (Corbin and Strauss, 2008). My position as an Iraqi born female with my potential attitudes and behaviours that result from exposure to our culture played an important role in the study process. While this was an advantage in enabling me to interpret the data, I took steps to reduce any pre-conceptions by focussing on the raw data and by ensuring the data were second coded by an experienced second researcher. Additionally, to insure the objectivity of the study findings, all audio recordings of the interviews were transcribed verbatim and direct quotes from the transcripts were used to represent emergent themes. I tried to be as

transparent as possible in reporting of the result and this is discussed fully in Chapter 4.5.

Integrating distinct viewpoints from women and doctors added further detailed information about the situation from two perspectives (Creswell *et al.*, 2011).

2.6 Phase three: Study intervention

In this phase of the study I carried out an intervention, which was an educational programme. This intervention programme was aimed at increasing cervical cancer screening knowledge among doctors and nurses in Kirkuk, Iraq. The main hospital in Kirkuk was chosen because it was the only hospital where the unit of early detection of CC exist. For training purposes, prior to this phase of the study, I attended an introductory training course on cervical cancer screening in Birmingham City University and Birmingham Women's Hospital, in the United Kingdom.

The objectives of the intervention were to:

- 1- Improve the quality of cytology training of doctors and nurses working in the departments of Obstetrics/ Gynaecologic in Kirkuk.
- 2- Improve the effectiveness of the current existing opportunistic CC screening.
- 3- Inform and define the target group of women suitable for cervical screening and the standard interval for screening, based on the current national situation of cervical cancer screening in the UK.

Permission to conduct this educational intervention was given by the administrator of Kirkuk Health Directorate (Appendix D). Also, I was grateful that permission was given by the team of the introductory training course on cervical cancer screening in Birmingham City University and Birmingham Women's Hospital, in the United Kingdom to use their training resources (Emails correspondence in Appendix E).

The intervention was implemented over two days for gynaecologists, health care practitioners and nurses. Further details of the intervention adapted from the UK training centre will be presented in chapter five.

2.7 Quantitative study

Quantitative research methods use variables that can be recorded numerically, producing data that can be categorised as nominal, ordinal, interval or ratio data (Bruin, 2006). Quantitative methods are most appropriate when there is a pre-existing knowledge on the topic (as was in the case of this study) as the use of standardised data collection instrument is possible. It also facilitates the collection of views of a wide study population and enables comparisons of variables and their categories to evaluate interventions (Kruger, 2003).

Quantitative research aims to answer a specific research question there are different types of interventional and observational studies; the study design is chosen based on how it can answer the study question of interest (Bruin, 2006). The findings of the qualitative study were used to identify key messages from which the intervention programme was developed to promote the use of cervical cancer screening programme; increase knowledge of screening programme and the Liquid Based Cytology Technique among health care professionals in Kirkuk, Iraq. I conducted a quasi-experimental study in 2016 in Kirkuk to evaluate pre and post intervention knowledge. Quasi-experimental studies are sometimes labelled a pre-post intervention design and are often used to evaluate the impacts of a specific intervention (Harris *et al.*, 2006). The researcher developed an educational course (comprehensive training course) on the cervical cancer screening programme. This educational programme was a collaboration of the researcher with Birmingham Cytology Training Centre (BWH and NHS, 2017).

The educational training course (comprehensive training course) consisted of series of lectures using audio visual aids such as Microsoft power point and video films. The video was produced by Birmingham Cytology Training Centre, Cervical Sample Taker Introductory Training Course team and consisted of a demonstration on how to take a 'Thin Prep Smear test'. The video was made with the sound track in English lasted in three minutes. Permission to conduct this intervention was given by the administrator of Kirkuk Health Directorate and the UK Birmingham City University and Birmingham Women's Hospital Cytology Training Centre.

2.7.1 Participants and recruitments

The total number of invited participants was 46 health care professionals: 27 doctors and 19 nurses participated in the intervention. However, only 23 doctors completed the pre-post evaluation questionnaire. Most of the participants had already participated in the Phase 2 qualitative study interviews. Because the nurses had no previous background and information on Smear test and cervical cancer screening programme, they were not asked to complete the questionnaire and their participation was primarily to prepare a cohort of nurses to be involved in the performance of the Smear test and the cervical screening programme. They did not therefore contribute data to the study.

Invitation letters from the Kirkuk Health Directorate had been sent to the two main hospitals in Kirkuk city, along with a number of the central health care centres, asking staff from each institution to nominate candidates (gynaecologist, general practitioners, and nurses) to participate in the intervention. The researcher booked a conference room in Azadi hospital, to carry out the training course for the period of 18/07/2016-19/07/2016. Forty six health professionals responded and attended the comprehensive training course.

2.7.2 Data collection

In order to evaluate the impact or the effectiveness of the intervention it was crucial to assess each participant's knowledge on the cervical cancer screening programme before the study intervention. Thus, I developed a self-administered questionnaire guided by the study objectives and the review of the previous literature to assess the participant's knowledge before and after the intervention. Each participant had been given a study identity number which they used to label both the pre- intervention questionnaire and the post- intervention questionnaire. The researcher was blinded to the number allocated to each participant. Each doctor was given 30 minutes to complete the questionnaire. The intervention started after all participants had completed the pre-intervention questionnaire. The intervention lasted for approximately seven hours on each of two days, including breaks. Following the intervention the researcher asked the participants to fill in the post-intervention questionnaire. All responses were completely anonymised and participants were assured of the confidentiality of their responses. As all the respondents were qualified doctors and English was their basic study language thus, the questionnaires were written in English.

The first part of the questionnaire was related to the demographic data of the doctors Table 2-6. The second sections involved question on the participants' knowledge of:-

- ✚ The risk factors for cervical cancer
- ✚ Eligible women for screening programme.
- ✚ The recommended routine screening interval for women
- ✚ Indicator of the transformation zone
- ✚ The responsibilities of the sample taker
- ✚ Recommend women and/or girls age for having the HPV vaccination
- ✚ Smear test techniques.

Table 2-6 Pre-Post intervention evaluation questionnaire

First section ---- Demographic characteristics	
Professional qualification	
How many years have you worked as a health professional since you qualified	
Job title	
Second section ---- Current Smear test performance	
Do you ever recommend <i>Human Papilloma Virus</i> (HPV) DNA testing for your female patients?	Yes, I recommend HPV DNA testing with the smear test for routine cervical cancer screening
	Yes, I recommend HPV DNA testing as a follow up test for an abnormal smear test
	No, I do not recommend HPV DNA testing at all
For the female patients Premenopausal, >= 30 years old who are HPV positive and recently had a smear test showing ASC-US (atypical squamous cells of undetermined significance), please indicate what you would typically do:	Manage in my own practice
	Refer to another practitioner (specify type)
During a typical month, for how many asymptomatic, average-risk female patients do you personally order or perform cervical cancer screening with smear testing?	1-10
	11-20
	20-30
	>30
Considering the Middle- East countries cultural and religious context, who would you refer for cervical screening	Married women
	Unmarried women
	Women at risk of sexual violence and abuse
	All women

Risk factors for cervical cancer include

Viral infection –particularly HPV16, 18, 31, 33

Smoking

Immunosuppression

Not attending for cervical screening

Use of hormone replacement therapy

Use of hormone replacement therapy

Previous family history of breast cancer.

Not sure

Eligible women for cervical cancer screening are those aged between:-

18-60 years

20-64 years

25-60 years

25-64 years

Not sure

The recommended routine screening interval for women aged 25-49 years is

1 yearly

2 yearly

3 yearly

5 yearly

Not sure

The indicator of the transformation zone is

Presence of mature metaplastic epithelial cells

Presence of immature metaplastic epithelial cells

Presence of squamous epithelium cells

Absence of squamous epithelial cells

Presence of endocervical and/or immature metaplastic cells.

Not sure

The responsibilities of the sample taker include

Ensure the whole of the transformation zone has been sampled

(cervix visualized and sampled 360 degree □5 times)

Ensure the whole of the transformation zone has been sampled

(cervix visualized and sampled 90 degree □3 times)

Ensure the whole of the transformation zone has been sampled

(cervix visualized and sampled 160 degree □5 times).

Not sure

At what age would you recommend women and/or girls have the HPV vaccination?

9–10 years

11–12 years

12–18 years

12–18 years

13–15 years

19–22 years

Not sure

During LBC cervical screening you have to rotate the cervix brush

2 times

4 times

5 times

3 times

Not sur

Cytobrush /endocervical (CTB) sample should be taken in

90 degree

45 degrees

80 degrees

60 degrees

Not sure

**For patients over 30 years who have borderline changes and low- grade dyskaryosis you
should**

Recommend a HPV test

Recommend screening again in 3 years

Recommend screening again in 5 years

Reassure the patient that these borderline changes very rarely need
treatment

Not sure

Colposcopy is recommended for the patients with:-

HPV+

Low grade CIN

High grade CIN

Not sure

Which cytology method is recently used most often for cervical cancer screening?

Liquid-based – specimen suspended in liquid solution

Conventional cytology – smear spread on glass slide and fixed

Other (specify)

Not sure

Indicate your level of agreement with the following statements

A 35-year-old woman with negative smear tests over the past 5 years and no new sexual partners asks whether she should continue having a regular smear test. Do you answer?

Yes, I strongly recommend she continues

Yes, if she is worried about herself

Yes, if she has any vaginal problems

No, she does not need it

No, but I would support her

How effective are the following screening procedures in reducing cancer mortality in average-risk women?

Very effective

Not effective

Not sure

Smear test

(conventional cytology)

Smear test

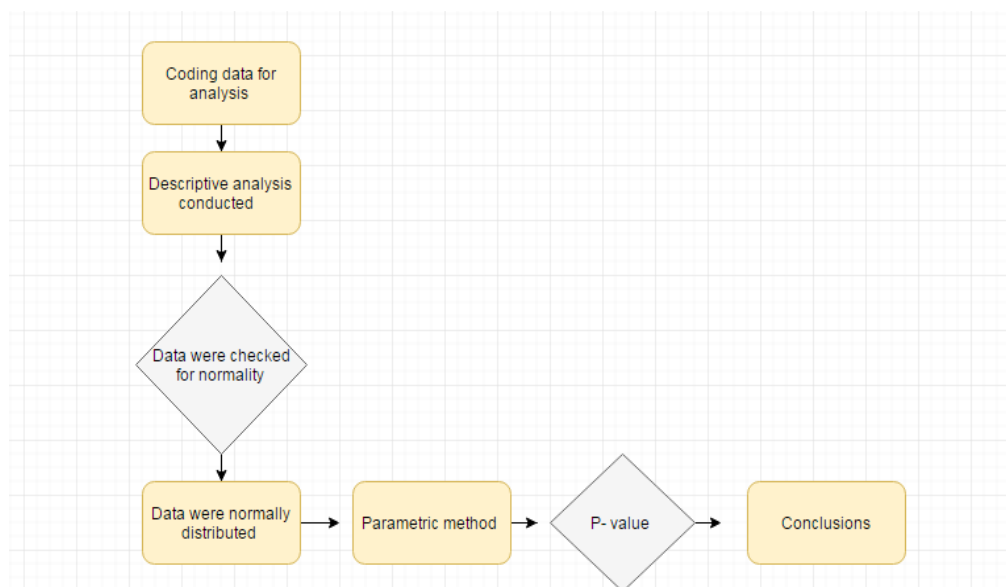
(Liquid based cytology)

HPV DNA test with Smear test

2.7.3 Data analysis

The data were analysed using Statistical Package for Social the Science SPSS software version 22 (IBM SPSS®). Standard descriptive analyses were administered to investigate the participants' demographic characteristics. Frequency analysis was conducted and there were no missing data for all the 23 participants, the normality of the differences was tested using a Shapiro-Wilk test (Shapiro and Wilk, 1965) and the differences were found to be normally distributed. Categorical variables are presented by numbers. For instance, to obtain the difference between doctors' knowledge and perceptions, pre- and post-intervention responses valued as follows: (1) was allocated for the correct answer and (0) for any incorrect answer. Data were coded and entered into the SPSS software. In the SPSS the data were coded in two columns, each row included the pre and post score for the same individual. One sample t-test (IBM SPSS®) was carried out to find the differences between scores before and after the intervention. McNemar's test (IBM SPSS®) was used to compare the difference in participant's knowledge and perceptions before and after the intervention (Figure 2-4).

Figure 2-4 Flow chart of data analysis using SPSS (Garth, 2008)



2.7.4 Ethics Approval

For the purpose of this part of the study, an application for ethical approval was submitted to Kirkuk Health Directorate and approval was obtained [Ref.n16149 in 04/08/2016, [please sees Appendix D]. All recruited participants were informed about the objectives of the research and the aims of the intervention.

2.8 Conclusion

To summarize, in this chapter I have explained the mixed method sequential exploratory design, and the rational for using this method for my doctoral project. I have included a description of the systematic review, the qualitative and the quantitative study.

In next chapter I will present the results of the (Phase one) systematic review and discuss the results in the light of other literature.

Chapter three

A systematic review of cervical cancer screening in Western Asia and Middle East Arab countries

3.1 Introduction

To explore the available evidence on the factors that affect Western Asia and Middle East Arab Muslim (WAMEAMs) women's access to cervical cancer screening and identify the interventions that have been implemented to increase the uptake of cervical cancer screening in those countries, a systematic review was undertaken. This focussed on studies assessing factors that influenced cervical cancer screening up take among women living predominantly in WAMEAM countries. Thirteen articles from an initial list of 621 potential papers were selected with direct relevance to the study. Several determinants were found to influence cervical cancer screening practices in Arab Muslim countries. I will explain the details in the following sections.

3.2 Objectives

The aim of this review was to identify the evidence-based strategies that have been implemented in WAMEAM countries to establish cervical cancer screening programmes. The specific objectives were:

- 1- To identify factors that have had an impact on the women's access to cervical cancer screening services in Western Asia and Middle Eastern Arab countries
- 2- To explore nursing interventions those have been implemented to increase the uptake of cervical screening in Western Asia and Middle Eastern Arab countries.

3.3 Methods

A systematic review is a summary of the research literature that is focused on a single question. It is conducted in a prescribed manner to try to identify, select, and synthesize all high quality research evidence relevant to that question (Bettany-Saltikov, 2012).

Here I will present in details the selection of studies, the research outcome, the quality appraisal and data extracted and analysed.

3.3.1 Design

A systematic review based on established guidance for undertaking reviews in health care published by the Centre for Review and Dissemination (CDR, 2009), was undertaken to assimilate ‘best evidence’ in answering the question ‘What are the factors that affect cervical cancer screening uptake among Arab Muslim Women?’. The review focused upon the interventions already implemented to increase cervical cancer screening uptake, considering all factors relating to intervention strategies for cervical cancer screening in Arab Muslim countries.

3.3.2 Selection of the studies

A systematic search for English language studies published in between January 2002 - January 2017 was undertaken. A complete list of selected studies with the reasons for excluding articles is included in Figure 3-1.

3.3.2.1. Inclusion and exclusion criteria

Papers were considered for inclusion if they:

1. Were based on research studies using any research methods
2. Focused on cervical cancer screening in Arab Muslim Countries
3. Included data on barriers or factors affecting uptake of screening.

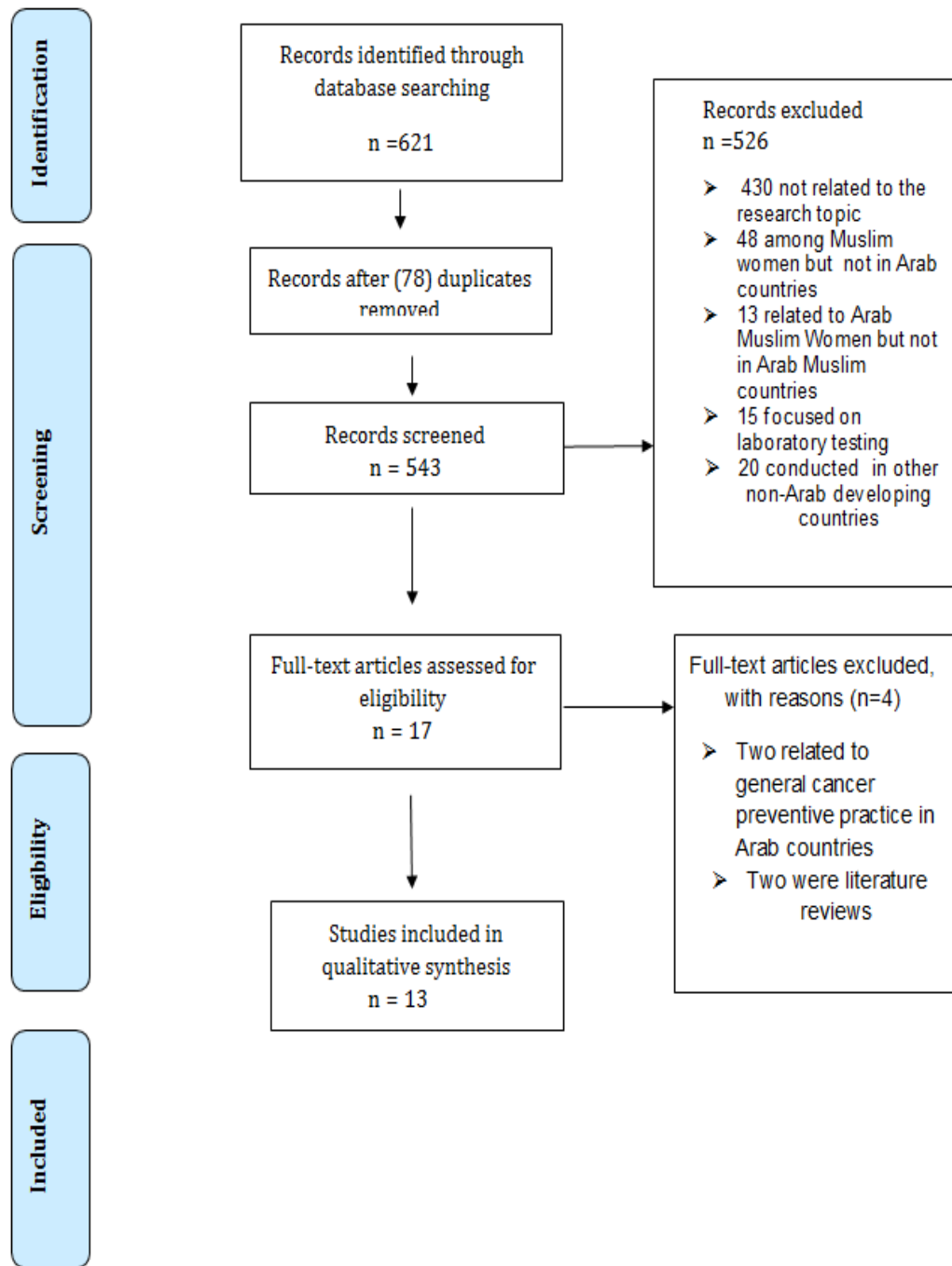
Papers were excluded if they were:

1. Focusing on laboratory testing
2. Reported data on Arab Muslim Women living outside Arab Muslim countries.

3.3.2.2. Search outcome

The study selection process is represented in a Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) flow-charts (Figure 3.1). The search of five databases CINAHL, AMED, MEDLINE, SCOPUS and GOOGLE SCHOLAR, initially produced 621 potential articles. With the second search 78 duplicates were removed. After reviews of the titles and abstracts, 526 articles were excluded (reasons for exclusion are summarized in Figure 3-1). Seventeen papers were assessed as potentially relevant, following review of these papers; two were related to general gynaecological cancer services in Arab countries, and empirical research was not reported in two papers, leaving thirteen for inclusion in the integrative review.

Fig. 3-1 PRISMA Flowchart of study selection



3.4 Quality appraisal

All papers considered for inclusion in the review were then subjected to independent analysis by the researcher and one supervisor (HS), using standard quality assessment criteria for evaluating original research papers from a variety of fields (Kmet *et al.*, 2004). This evaluation method allows the systematic evaluation of both qualitative and quantitative researches. Fourteen quality assessment questions were used to appraise the methodological quality of each quantitative study, and 10 were applied to the qualitative study. The scorer assigned 0 points (not addressed), 1 point (partially addressed) or 2 points (satisfactorily addressed) to each question, as shown in Tables 3-1 and 3-2. The summary percentage score was calculated by dividing total score summed across all applicable items by the highest possible score total after excluding non-applicable items (Kmet *et al.*, 2004).

3.5 Data abstraction and analysis

Due to disparity in design and study populations, it was not appropriate to conduct a meta-analysis of the data; narrative description of the findings was undertaken using thematic analysis of the papers. Initially, we made a summary of each paper as presented in Table 3.2. Further, codes relevant to the research objectives were identified in each article and different codes were combined to define themes that explained larger sections of the data and were given specific names. The thematic analysis was confirmed by the researcher and one of the supervisors (HS).

Table 3-1 Quality scoring (quantitative studies)

	<i>Saadoon et al. (2012)</i>	<i>Hwaid (2013)</i>	<i>Sait (2009)</i>	<i>Badrinath et al. (2004)</i>	<i>Maaita & Barakat (2002)</i>	<i>Al-Sairafi & Mohamed (2007)</i>	<i>Obedat et al. (2012)</i>	<i>AL-Meer et al. (2009)</i>	<i>Amari et al. (2006)</i>	<i>El-Hammasi et al. (2008)</i>	<i>Barghouti et al. (2008)</i>	<i>Bakheit et al. (2004)</i>
1. <i>Question/objective clearly described?</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2. <i>Study design evident and appropriate</i>	Yes	Yes	Yes	Partial	Partial	Partial	Yes	Partial	Yes	Yes	Yes	Yes
3. <i>Method of subject /comparison group selection or source of information /input variables described and appropriate</i>	Yes	Partial	Partial	Partial	Partial	Yes	Yes	Yes	Partial	Partial	Yes	Partial
4. <i>Subject (and comparison group, if applicable) characteristics sufficiently described?</i>	Yes	Partial	Yes	Partial	Partial	Yes	Partial	Yes	Yes	Yes	Yes	Partial
5. <i>If interventional and random allocation was possible, was it described</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6. <i>If interventional and blinding of investigators was possible, was it reported?</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7. <i>If international and blinding of subjects was possible, was it reported?</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8. <i>Outcome and (if applicable) exposure measure(s) well defined and robust to measurement /misclassification bias? Means of assessment reported?</i>	Partial	Yes	Partial	No	Partial	Partial	Partial	Yes	Partial	Partial	Partial	Partial
9. <i>Sample size appropriate</i>	Partial	Partial	Yes	N/A	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes

10. <i>Analytic method described/ justified and appropriate?</i>	Yes	Yes	Yes	Yes	No	Yes	Yes	Partial	Partia l	Yes	Yes	Yes
11. <i>Some estimate of variance is reported for the main result?</i>	Yes	No	No	No	No	Yes	Yes	Partial	Yes	Yes	Yes	No
12. <i>Controlled for confounding?</i>	N/A	No	No	N/A	N/A	N/A	No	N/A	N/A	N/A	N/A	N/A
13. <i>Results reported in sufficient detail/</i>	Yes	Yes	Yes	Partial	Partial	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14. <i>Conclusions supported by the result?</i>	Yes	Yes	Yes	Partial	Partial	Partial	Yes	Partial	Yes	Yes	No	Yes
Score	18/20	15/20	16/20	9/20	10/20	15/20	18/20	16/20	17/20	18/20	17/20	15/20
Percentages	90%	75%	80%	45%	50%	75%	90%	80%	85%	90%	85%	75%

Table 3-2 Quality scoring (qualitative studies)

<i>Quality assessment</i>	<i>Question 1</i>	<i>Question 2</i>	<i>Question 3</i>	<i>Question 4</i>	<i>Question 5</i>	<i>Question 6</i>	<i>Question 7</i>	<i>Question 8</i>	<i>Question 9</i>	<i>Question 10</i>
	<i>Objective clearly described?</i>	<i>Design evident and appropriate to answer study question?</i>	<i>Context for the study is clear?</i>	<i>Connection to a theoretical framework / wider body of knowledge?</i>	<i>Sampling strategy described, relevant and justified?</i>	<i>Data collection methods clearly described and systematic?</i>	<i>Data analysis clearly described, complete and systematic?</i>	<i>Use of verification procedure(s) to establish credibility of the study?</i>	<i>Conclusions supported by the results?</i>	<i>Reflexivity of the account?</i>
<i>Khan et al. (2015) United Arab Emirate</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes.</i>	<i>Yes</i>	<i>Partial</i>	<i>Yes</i>	<i>Partial</i>	<i>Partial</i>	<i>Yes</i>	<i>Partial</i>
Score										<i>16/20</i>
Percentage										<i>80%</i>

3.6 Results

The key characteristics of the data extracted from the individual papers are presented in Table 3-3. Of the thirteen studies that met the inclusion criteria, two studies were undertaken in Iraq, four in Jordan, two in Kuwait, one in Saudi Arabia, three in United Arab Emirate, one in Qatar. The target populations in the majority of these studies included Arab Muslim Women living in these countries. One study from Iraq (Hwaid and Haseeb, 2013) targeted the female physicians and nurses who worked in AL-Batole Maternity and Children Teaching Hospital, another study from United Arab Emirate involved all female physicians from Abu Dhabi emirate and physicians offering women's welfare clinics in Dubai, which represents 65% of the United Arab Emirates population. Cross sectional methods were applied in all included studies apart from one in which the researcher adopted a qualitative method. Sampling techniques varied, although in general researchers used random sampling most frequently [Saadoon *et al.* (2014), Hwaid and Haseeb (2013), Sait (2009), Al-Meer *et al.* (2011), Bakheit and Haroon (2004), Al Sairafi and Mohamed (2009), Barghouti *et al.* (2008), Maaita and Barakat (2002), Amarin *et al.* (2008)]. There was one example of randomized cluster sampling El-Hammasi *et al.* (2009) and three studies in which purposive sampling was used [Badrinath *et al.* (2004), Obeidat *et al.* (2012) and Khan and Woolhead (2015)]. The data for the studies were gathered from medical facilities [Hwaid and Haseeb (2013), Badrinath *et al.* (2004), Al Sairafi and Mohamed (2009), Sait (2009), Obeidat *et al.* (2012), Al-Meer *et al.* (2011), Amarin *et al.* (2008), (El-Hammasi *et al.*, 2009), Barghouti *et al.* (2008)] and school environments [Saadoon *et al.* (2014), Bakheit and Haroon (2004)]

The sample sizes ranged from 13 women in the qualitative study to between 187 -760 participants in studies based on quantitative methods. All participants

were aged 17 years and above. All but two studies included Arab women, teachers and students and two of the studies involved female physicians, nurses and midwives who worked in medical gynaecology clinics at Medical Centres (Hwaid and Haseeb, 2013), Badrinath *et al.* (2004).

3.6.1 Factors identified

Several determinants were found to influence cervical cancer screening practices among AMW. These were labelled as;

- Absence of organized systematic population based cervical cancer screening
- Lack of women's knowledge about screening
- Health care professionals' attitude towards screening
- Pain and embarrassment
- Cultural beliefs.

3.6.1.1 Absence of organized systematic population based cervical cancer screening

Most of the included studies reported absence of a screening program and therefore attendance for cervical cancer screening was mainly opportunistic. However, opportunistic screening relies upon the knowledge of women and El-Hammasi *et al.* (2009) reported that women in general were inadequately informed. The study showed that about 42% of women who participated in the study were told about a smear test by their physicians, and about 22% had never heard about it. Such findings have been reported by a number of previous studies in Arab communities. For example, authors of a study from Saudia Arabia who assessed attitudes, knowledge, and practices in relation to cervical cancer and screening among women reported that 67.6% of participants who were aware of cervical screening had

obtained their information from the media or doctors. Sait (2009) stated that it is predictable that targeted women participate in opportunistic screening during their attendance at healthcare facilities because no population based screening programme has been implemented in Arab Muslim countries. Meanwhile, Amarin *et al.* (2008) from Jordan found that 85.7% of women who participated in their study had never received a smear test. Of the 109 (14.3%) who had ever had a smear test, only five had not been the result of opportunistic screening. In a study designed to assess factors influencing Smear test practices among married primary school teachers in Diyala city (Iraq), Saadoon *et al.* (2014) reported that medical advice was the most important reason cited by (60.7%) of 222 participants for undergoing the smear test. The study found two factors were significantly associated with smear test practice: encouragement by the husband ($p < 0.001$) and history of gynaecological examination ($p = 0.008$). Al-Meer *et al.* (2011) from Qatar reported that relatives and friends (21.6%) were the main sources of information about the smear test. In the United Arab Emirates (UAE), Badrinath *et al.* (2004) stated that more than 90% of the physicians expressed a need for a cervical screening programme in the UAE.

Table 3.3 Characteristics of included studies

Study	Country	Sample size	Method	Purpose of the study	Method of analysis	Main findings	Quality issues
Al-Meer et al. (2011)	Qatar	500 women at five randomly selected primary health care centres in Qatar	Cross –sectional interview based (quantitative method)	To determine the knowledge, attitude and practice of Qatari women regarding cervical screening	Data were analysed by using bonferroni test for multiple comparisons.	Inadequate knowledge and practice among women under 30 years of age and those with low education level	Method of sample selection and source of information were appropriate and well described, but the design and the analytic methods were not justified
Al Sairafi and Mohamed (2009)	Kuwait	300 married Kuwaiti women randomly selected from those who visited the clinics, irrespective of reasons for the visit	Cross sectional structured questionnaire (quantitative method)	To assess knowledge, attitude and practice regarding cervical cancer screening among Kuwaiti women	The Chi squared test was used to assess the association between two qualitative variables and multiple logistic regression analysis was used to estimate the risk of different factors.	1-Only (52.3%) of women had adequate knowledge about the test 2- The educational level was the only factor significantly associated with inadequate knowledge and attitudes on smear test	Design was not clearly identified; data collection methods were not completely described and some of the conclusions are unsupported by the data
Amarin et al. (2008)	Jordan	760 women attending general obstetrics and gynaecology clinics in Irbid, Jordan	Cross sectional Survey (quantitative method)	To investigate attitudes and beliefs that affect a woman’s decision to undergo cervical smear test	Questionnaire based survey data were analysed using descriptive statistics (mean, standard deviation)	Around 95% of the sample had never had the test. Major barriers to Smear test screening included inadequate knowledge	Study objectives sufficiently described, but the input variables not clearly identified.
Badrinath et al. (2004)	United Arab Emirates	98 female physicians from Abu Dhabi emirate and physicians offering women’s welfare clinics in	Cross sectional Self-administered questionnaire (quantitative method)	1-To assess the knowledge, attitude and practice of (UAE) female primary care physicians regarding	Data were analysed using Chi-square tests.	Only 40% of female primary care physicians have ever performed a Smear test and the staff were not yet ready to	The design being incompletely described Demographic information was not reported and

		Dubai, which represented 65% of the UAE population along with two other smaller emirates that were involved in the study		cervical screening 2-To identify the physicians' training needs on this topic.		implement a cervical cancer screening program	outcome measures were not well defined
Bakheit and Haroon (2004)	United Arab Emirates	350 female married school teachers in Shajah City were participated in this study	Cross-sectional (quantitative method)	1-To determine the level of knowledge and attitude of the target population and where the participants preferred to have the smear test 2-To identify factors that influence women's participation in the screening program	Data were analyzed using frequency distributions, cross tabulation with the person co efficient, Chi-squared tests.	1-Teachers had good knowledge about Smear test but they were not commonly practicing it because of their belief that it might be painful, followed by embarrassment 2-The study demonstrated that there were no statistical relationships between age, husbands' education, marriage duration and the women's knowledge and attitude to Smear test use.	The selection methods were not completely described and the description of the interview content was incomplete.
Barghouti et al. (2008)	Jordan	674 female patients aged 17 years and above and attending family medicine clinics at Jordan University Hospital	Cross-sectional (quantitative method)	1-To describe and estimate the effect of five socio-demographic variables and insurance status on awareness of Smear test 2-To estimate the influence of sociodemographic characteristics,	Cross tabulations and chi-square tests were used to describe the sample. Multivariate logistic regressions were performed to estimate the factors that influence awareness of	1-40.3% reported having had a history of a smear test, while 45% of them had the smear test specifically within the past 3 years. 2-Women were statistically significantly less likely to be aware of the Smear test if they	Study characteristics sufficiently described and appropriate sample size, but means of assessment not clearly reported

				health insurance and knowledge score on having a smear test.	smear test screening.	were older than 35 years	
El-Hammasi et al. (2009)	Kuwait	Cluster sampling of 299 women attending polyclinics in Kuwait	Cross –sectional descriptive (quantitative method)	1-To estimate the lifetime prevalence of smear test among women in Kuwait 2-To assess women’s knowledge and attitude toward smear	Multistage cluster sampling data were analysed using a descriptive statistics (percentage, frequency) with use of Chi-square tests to find the association between variables.	The lifetime prevalence of Smear test was 37%. 44% of participants had a Smear test only once in their lifetime.	Study design appropriate and clearly identified, analytic methods distinctly described, but input variables not clearly described
Hwaid and Haseeb (2013)	Iraq	198 women aged between (17-60)years divided in to 2 groups students and female physicians and nurses who worked in AL-Batole Maternity and Children Teaching Hospital	Cross-sectional (quantitative method)	To evaluate knowledge and awareness about human papillomavirus (HPV) and cervical cancer among women	Data were analysed by using Chi-square test	Inadequate levels of knowledge and awareness about (HPV),cervical cancer, and Smear test	The selection strategy was not completely described, with no information regarding estimate of variance.
Maaita and Barakat (2002)	Jordan	600 women attending gynaecology clinics at King Hussein Medical Centre, Amman, Jordan	Descriptive cross sectional survey (quantitative method)	1-To assess Jordanian women’s knowledge of the cervical cancer smear 2-To assess that factors that influenced Jordanian women’s decision to have an up-to date smear test	Frequency and percentages used for analysing the data.	75% of women had never attended to have a Smear test and 77%of women were not aware of causes of cervical cancer	The study design was not explicit. , The sampling strategy was unclear and the description of the interview content was incomplete.
Obeidat et	Jordan	187 female health	Cross –sectional	To investigate	Descriptive	147.2% of	Appropriate study

al. (2012)		care workers: 53 physicians, 92 nurses/midwives, 42 others.	(quantitative method)	Jordanian female health care workers' awareness, practice and attitude toward cervical cancer screening	statistics. Logistic regression analysis was used to determine the statistical significance	participants were not aware that screening was available 2- The health care professionals had had negative attitude towards screening	design and the objectives clearly identified, but exposure measures not distinctly described
Saadoon et al. (2014)	Iraq	Random sample of 222 teachers aged (20-63) years residing in Diyala city	Cross sectional (quantitative method)	To assess the factors influencing smear test practice among married primary teachers in Diyala city	Data were analysed using descriptive statistics, such as the frequency and percentage distribution and Chi square tests.	The study showed very low rate of smear test practice (12.6 %).the study found that only the husbands' encouragement influenced women decision to undergo smear test screening.	Even though characteristics and analytic methods clearly identified, but means of assessment not distinctly reported
Sait (2009)	Saudi Arabia	600 randomly selected women from different groups in Jeddah, Saudia Arabia	Cross sectional (quantitative method)	To assess the knowledge, attitude, and practices related to cervical cancer screening and it is underlying aetiology and preventive measures among women living in the Kingdom of Saudi Arabia	Data were analysed by using Chi-square tests. ,	Only (16.8%) of selected women had undergone a smear test and the main reason for not having a smear test was lack of awareness.	Appropriate sample size and study design but the input variable not well described. Exposure measures not well identified
Khan and Woolhead (2015)	United Arab Emirate	13 women purposive and snowball sampling techniques.	Qualitative study using in-depth semi-structured interviews.	1-To explore Muslim women's perspectives toward cervical screening in Dubai 2- To promote cervical cancer screening uptake.	Thematic analysis was applied with comparative analysis between and within the groups.	cultural, religious, sexual behaviour were found to effect educated Muslim women's perspectives on cervical cancer screening	The sample not a maximum variation sample, therefore saturation may not have been reached. The researchers could have been more reflexive

3.6.1.2. Lack of women's knowledge about screening

The findings showed a deficiency in knowledge about cervical cancer as well as low smear test uptake among Arab Muslim Women in Arab countries. For instance in Iraq, Saadoon *et al.* (2014) found that among the total of 222 teachers who participated, only 32.4% had satisfactory knowledge about cervical cancer and Smear test screening and only 12.6% underwent smear test. Among those who had Smear test tests, more than two thirds (71.4%) had a smear on only one occasion, compared to 17.9% who had undergone smear test twice. Another study from Iraq by Hwaid and Haseeb (2013) concluded that women had very limited knowledge and awareness of the smear test: only 57 (28.79%) from a total of 198 women who had been involved in the study knew that the purpose of the smear test was to detect abnormal cervical cells. Khan and Woolhead (2015) found that some beliefs of the educated women who were interviewed were inaccurate, for instance, they considered poor hygiene, mostly through use of public toilets, to be the cause of cervical cancer. Al-Meer *et al.* (2011) from Qatar stated that, of the 500 women who participated in his study, only 40% had had a smear test although over 85% had heard of cervical cancer and 79% had heard about the smear test. The authors also declared that over half of the participants wanted the test to be performed in the well-women clinic at a primary health care centre. In Jordan, only 50.9% of the 187 female health care workers participants had awareness of Smear test and screening (Obeidat *et al.* 2012). In Kuwait, of the 300 women participant in a study by Al Sairafi and Mohamed (2009), only 52.3% had adequate knowledge about the test. The level of education was the only significant factor independently associated with

inadequate knowledge and attitude towards Smear test ($p = 0.006$ and $p = 0.001$, respectively)

3.6.1.3. Health care professionals' attitude towards screening

Barriers to cervical screening include inadequate knowledge about smear testing, providers' negative attitudes and limited access to female doctors (Obeidat *et al.*, 2012). Female health care workers' awareness, practice and attitude toward cervical cancer screening was studied by Obeidat *et al.* (2012), who reported that despite of the availability of cervical cancer screening facilities, the uptake of cervical cancer screening was poor. Of 187 female health care worker participants, 34 (47.2%) were not aware that screening was available. In Kuwait a study by Al Sairafi and Mohamed (2009) showed the main reason for not having the Smear test was that it was not suggested by the doctor. Another study in the UAE, designed to assess the knowledge, attitude, and practice of UAE female primary care physicians of cervical screening through a self-administered questionnaire, stated that of the 98 physicians who participated in the study only 38 (40%) reported ever having performed a smear test. In addition 42 (72.4%) were willing to take on this new responsibility, five (8.6%) were not, and 11 (19%) were undecided (Badrinath *et al.*, 2004).

3.6.1.4 Pain and embarrassment

In a study by Bakheit and Haroon (2004) designed to determine individual views and experiences on cervical cancer and strategies of screening in the UAE, the authors surveyed 1638 teachers (all married female teachers in Sharjah, UAE). Of the 350 teacher respondents from 48 schools, the majority (84%) had a good knowledge of cervical screening but they were not presenting for the smear test. Overall, the most

frequently reported reasons for not having a recent smear test were belief that it might be painful (representing 42% of the population), followed by embarrassment which represented 36.1% as the second most common reason (Bakheit and Haroon, 2004). These results were confirmed by Khan and Woolhead (2015), who reported fear and embarrassment in those who had never been screened. Authors of another study from Jordan (Maaita and Barakat, 2002) found that 22% of the 600 women who participated in the study were embarrassed about having a smear test.

3.6.1.5. Cultural beliefs

Data on stigma and beliefs were identified in a study by Maaita and Barakat (2002), who reported 30.2% of 600 participant women had no symptoms and thought it was unnecessary to perform cervical screening. Also in the UAE, Bakheit and Haroon (2004) also found 17% of 350 participant women had not had a Smear test because they were feeling healthy. El-Hammasi *et al.* (2009) from Kuwait reported that 14% of 299 participants pointed to the fear of the diagnosis of cancer as the most common perceived barrier. A study by Khan and Woolhead (2015) reported that intentions regarding cervical screening are influenced by cultural norms such as female modesty. Also, they claimed that the Emirati women declared their preference to be accompanied by a family member while visiting a doctor, a request based on socially acceptable cultural practices. Further, they also demonstrated their willingness to obtain the approval of their husbands for screening.

3.7 Discussion

The aim of this review was to identify barriers facing Arab Muslim Women in the context of cervical cancer screening in Arab Muslim countries. A comprehensive electronic search was conducted to retrieve papers that would answer the review question. Thirteen papers were included. A factor that could have biased in the paper selection was that the search was restricted only to English language papers, which excluded any primary research reported in other languages. Also, all of the included papers were conducted in different Arab Muslim countries with different cultural beliefs and health care systems; this may have influenced factors related to Arab Muslim Women access to cervical screening. However, it is also strength of the review that our findings have not been restricted to one underlying cultural context. Our systematic review revealed that the twelve quantitative studies included were cross-sectional surveys with data analysis using descriptive statistics. However, while quantitative approaches are useful, the design may not enable attention to be focussed on participants' perspectives within the contexts of their environments. All included studies were conducted in smaller settings in different Arab Muslim countries, although the hospitals where recruitment took place varied in whether or not they had established population based cervical screening program. A study by Sait (2009) demonstrates that in Arab Muslim countries, the attendance of Arab Muslim Women for cervical cancer screening was opportunistic; there were no intervention strategies being employed in most of Arab Muslim countries. This is in sharp contrast to the use of organized population-based screening in many western countries, whereby strategies to improve screening uptake in these countries include invitation letters, re-call letters, and follow-up plus phone reminders as an effective intervention strategy (Everett *et al.*, 2011).

Current practice in the UK and a number of developed countries involve sending invitation letters from both GPs (health care centers) and local health authorities (Everett *et al.*, 2011). As long ago as 1985, Eardley *et al.*, (1985) examined the reasons behind the failure of the opportunity for cervical cancer prevention and put forward principles for the development of more effective screening programmes. Eardley *et al.*, suggest cervical cancer screening should be provider initiated and user oriented, and should aim to ensure complete coverage of the target population by inviting all eligible women to attend for screening. Furthermore, a careful health education approach takes account of issues relating to the effectiveness, function, and acceptability of the test and would seek to address women's fear and anxiety within the invitation (Eardley *et al.*, 1985). Among the twelve included studies, we found evidence to suggest the awareness of cervical cancer among Arab Muslim Women in Arab Muslim countries is far behind that in the developed countries. The international findings from developed westernized countries provide a useful background for understanding the recruitment strategies that are likely to increase the uptake of cervical smear among Arab Muslim Women. These studies emphasized the need for well-designed community based health education programmes to increase Arab Muslim Woman's' awareness of disease prevention and treatment. The most effective public health intervention to increase screening in any nation could be a targeted intervention designed to meet the needs of different socio-economic or ethnic groups (Dunn and Tan, 2010). Educational materials are likely to be important in increasing informed uptake, outlining important summary aspects of the screening process. In the UK the Department of Health (government) has produced an information leaflet emphasizing the risks and benefits of screening. It is recommended that this is included with every invitation for screening (Everett *et al.*, 2011).

In addition to this, the findings from three studies ((Badrinath *et al.*, 2004) / United Arab Emirate and Obeidat *et al.* (2012)/ Jordan; Hwaid and Haseeb (2013) / Iraq), have brought to light some important findings related to health care professional awareness and attitude toward cervical screening. It is indicated that the awareness of cervical screening and its prevention by use of smear test was limited among health care professionals, and their attitudes were negative. In the absence of a systematic screening programme, the burden is on the health care staff to offer women opportunistic screening. The review confirms that it is possible and desirable to train midwives / nurses to carry out screening tests for cervical screening (Sherigar *et al.*, 2010). Providing essential information through well-organized health promotion activities and communication advocated by nursing professionals is considered to be important in motivating awareness and reducing barriers for women to uptake the smear test (Guvenc *et al.*, 2013). Another example of this is illustrated through the developing role of general practice nurses (PNs) in the delivery of cervical screening in the United Kingdom (UK) and Australia. In the UK, authorized training in cervical screening techniques is provided through Marie Curie Cancer Care, family planning courses and through postgraduate study (Holmes *et al.*, 2014). According to the UK National Health Service Cervical Screening Programme, every primary care centre has a nominated person responsible for its screening programme and for implementing the national guidelines (Holmes *et al.*, 2014). The recent Cervical Screening programme guidance refers to the crucial role of both doctors and nurses when discussing the smear test (National Health System, 2004, Holmes *et al.*, 2014). Again, Holmes *et al.* (2014) stated that in the UK 72% - 82% of Smear test s were carried out by practice nurses.

However, the transferability of western nursing strategies to Arab Muslim countries is challenging. The cultural acceptability of routine population wide cervical cancer screening for Arab Muslim Women in Iraq has yet to be determined. As a first step, our review confirmed that there are significant socio-cultural barriers to cervical screening organisation and uptake in Arab Muslim countries. Personal embarrassment and modesty seem to be a powerful barrier. Modesty and shyness are social characteristics expected of AMW with respect to physically visualizing personal or private information about the female body. Shyness about the body may prevent the necessary professional discussion about cervical cancer as a private or sensitive health issue. Marital relationships and family planning devices are considered very private issues and are less likely to be discussed with other people, especially men, including husbands (Salman, 2012).

Finally the challenge noted by authors of most included studies was women's fear of cancer and their low participation in cervical cancer screening, which it was felt, could be effectively addressed with culturally appropriate interventions focused upon raising awareness of the disease. Many Arab people understand cancer as a fatal disease and consider it to be a death judgment: Arab Muslim Women often avoid the word "cancer" and more likely identify the disease by few words such as "that malignant disease." This supports the early sociological literature on cancer which suggests that disease is a 'taboo' worldwide for as long as little is known about the cause of illness and in contexts where it is perceived to be incurable (Sontag and Broun, 1977). As global awareness of disease prevention and the prospects of cure improve, the disease is less stigmatized. Nonetheless, it would appear that most Arab Muslim Women in the studies reviewed perceived cervical cancer as a terminal illness with no hope for a cure, even

when it was detected early (Were *et al.*, 2011). Indeed, the cervical cancer statistics in Arab Muslim countries suggest stark health inequalities. Screening is unavailable in Arab Muslim countries generally, while socio-cultural stigma relating to the disease is relevant; some literature suggests Arab Muslim Women consider a cervical cancer diagnosis to be a punishment from God for previous wrongdoing or as a test of their faith and patience that they have to accept (Matin and LeBaron, 2004). In most cases, it should be noted that the underlying beliefs and perceptions of health among Arab Muslim Women are greatly influenced by their culture and religion. Because of the importance of virginity, unmarried women are not expected to seek out gynaecology health care (Matin and LeBaron, 2004). When beliefs such as destiny and fear of cancer are mixed with cancer fatalism, they can act as significant barriers to preventative health seeking practices among Arab Muslim Women in the Middle East (Donnelly *et al.*, 2013).

3.8 Conclusion

This integrative review indicates that promoting cervical cancer screening uptake among Arab Muslim Women is an important issue to be considered by public health policy makers. Further, this review highlighted significant health inequalities for Arab Muslim Women in that no population based cervical cancer screening programmes have been implemented in most of the Arab Muslim countries. Meanwhile the study findings indicate low levels of education and awareness on cervical screening and low uptake rates for the smear test among Arab Muslim Women. This review identified research gaps in the existing cervical cancer screening intervention studies, and could be useful in identifying options for cervical cancer screening promotion interventions when increasing community demand for this service is indicated. Future research should focus

on developing culturally sensitive innovation in cervical screening strategies; to promote global population based-screening and to increase evidence based cervical screening uptake among Arab Muslim Women in Arab Muslim Countries.

Chapter four

Phase 2 Qualitative Study

4.1 Introduction

In this chapter, I will report in detail the findings of the qualitative phase of this study and discuss the findings in the light of other published literature. As indicated in Chapter 2, semi-structured interviews were conducted with 18 women who were either attending for a Smear test appointment or seeking gynaecologic services in primary health care. Ten interviews took place in the Unit of Early Detection of Cervical Cancer, Azadi Hospital, Kirkuk, Iraq and eight in the primary health care centres. I also conducted semi-structured interviews with a purposive sample of 13 doctors working in gynaecological services. The semi-structured interviews were conducted over three months from June to September 2015. These one to one interviews were conducted by me, and involved encouraging women to share their perceptions and experiences regarding the Smear test. Data analysis began with the first interview and recruitment continued until saturation was reached. The aims of these interviews with the women were to:-

- 1- Identify women's knowledge regarding cervical cancer and the early detection of cervical changes through regular screening
- 2- Explore the facilitators and the barriers for cervical cancer screening among women living in Kirkuk.
- 3- Identify women's perceptions towards cervical cancer screening

- 4- Identify the acceptability of the cervical cancer screening among women living in Kirkuk.

Additionally, the aims of the interviews with the gynaecologists were to:-

- 1- Explore doctors' views on the current cervical cancer screening programme
- 2- Identify the clinical challenges facing the health care professionals in order to establish an organized population- based cervical cancer screening programme.
- 3- Explore doctors' experiences with patients diagnosed with cervical cancer
- 4- Identify if doctors had undertaken any training courses on the current cytology techniques used worldwide for early detection of cervical cancer screening
- 5- Identify the acceptability of the smear test to be included as part of the doctors' day to day duties
- 6- Elucidate suggestions and recommendations to establish a successful population-based cervical cancer screening in Iraq.

In this chapter, I will present the integrated results from both sets of interviews. The purpose of combining the data from interviews with doctors and patients was to gain a more comprehensive overview of the research topic.

4.2 Findings

4.2.1 Demographic characteristics of the participants

The sample consisted of 13 gynaecologists (12 based in hospitals, one a general practitioner from the health care centre) and 18 women attending for their appointment for a smear test or visiting a health care centre, to whom I will refer as patients.

4.2.2 Demographic characteristics of the doctors

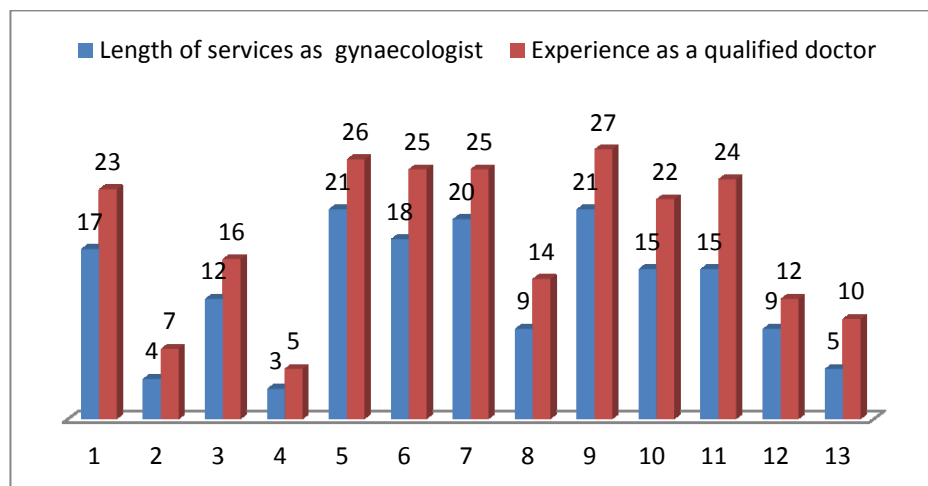
A purposive sample of 13 gynaecologists was interviewed Table 4-1, all were practitioners who were working in obstetrics and gynaecologic health care services in the main hospitals along with those who were working in the health care centres in Kirkuk. The semi-structured interviews were conducted in one of three local city languages; according to the doctor's choice. The mean length of experience as a doctor was 18 years, while mean length of experience as a gynaecologist was 13 years, with a range of three to 27 years (Figure 4-1). All the gynaecologist participants were female. I will refer to them as doctors.

Table 4-1 Demographic data of doctors

Interviewee (Doctors)	Qualification	Job Title	Length of experience as a gynaecologist	Type of cases seen
D1	BSc. Medicine; D.O.G (High diploma in Gynaecology and Obstetrics)	Gynaecologist	17	All gynaecology and obstetrics cases
D2	BSc Medicine	GP practitioner	4	All cases such as: paediatric; adult medical cases; maternal and gynaecological cases
D3	Arab Board in ob. Gun. (CABOG)	Gynaecologist Consultant and lecturer at School of Medicine	12	All gynaecology and obstetrics cases
D4	CABOG	Gynaecologist, lecturer at School of Medicine	5	All gynaecology and obstetrics cases
D5	BSc. Medicine; D.O.G MSc from Hill University	Gynaecologist, Assistant lecturer at School of	25	Mixed cases of gynaecology and obstetrics but mainly Infertility

		Medicine		
D6	BSc. Medicine; D.O.G	Gynaecologist	18	All gynaecology and obstetrics cases
D7	BSc. Medicine; D.O.G	Gynaecologist	20	All gynaecology and obstetrics cases
D8	BSc. Medicine; D.O.G	Gynaecologist	9	All gynaecology and obstetrics cases
D9	BSc. Medicine; D.O.G	Gynaecologist	21	All gynaecology and obstetrics cases
D10	BSc. Medicine; D.O.G	Gynaecologist	15	All gynaecology and obstetrics cases
D11	BSc. Medicine; D.O.G	Gynaecologist	15	All gynaecology and obstetrics cases
D12	BSc. Medicine; D.O.G	Gynaecologist	7	All gynaecology and obstetrics cases
D13	BSc. Medicine; D.O.G. MSc. in family medicine	Gynaecologist	5	All gynaecology and obstetrics cases

Figure 4-1 Average length of doctors' service and experience as a qualified doctor



4.2.3 Demographic characteristics of the patient participants

For this phase of the study, the participants were sampled from the Iraqi communities in Kirkuk City. Overall, 18 women participated in this phase of the study (Table 4-2). The semi-structured interviews were conducted in one of three local city languages,

according to the participants' choice and then translated by the researcher to English language. The mean age of the 18 interviewed patients was 32 years (SD= 8.145), with a median age of 33 years. The age range was 18- 47 years. The level of education of women in this group is shown Table 4-3 and it is evident that over 2/3 of the women had not attended secondary school or higher education.

Table 4-2 Demographic data of patients

Interviewees (Women attended for their normal ST)	Age	Age at First Pregnancy	Level of Education	Number of children
P1	43	20	Primary school graduated	3
P2	47	23	Diploma	3
P3	24	16	Primary school graduated	3
P4	18	17	Attended secondary school	1
P5	45	20	Intermediate school graduated	6
P6	36	18	Primary school graduated	4
P7	35	26	Primary school graduated	3
P8	35	30	Primary school graduated	4
P9	32	28	Intermediate school graduated	2
P10	31	20	Attended primary school	4
P11	38	24	University graduated	4
P12	37	21	High school graduated	5
P13	29	18	Attended primary school	4
P14	26	17	Primary school graduated	5
P15	16	14	Attended Intermediate school	2
P16	36	16	Intermediate school graduated	5
P17	16	14	Attended Intermediate school	2
P18	36	20	Attended primary school	4

Table 4-3 Level of education of patient participants

Education level	Frequency	Cumulative Percent
Did not attend school	3	16.75%
Attended primary school	4	22.2%
Primary school graduate	5	27.8%
Attended intermediate school	1	5.6%
Intermediate school graduate	1	5.6%
Attended secondary school	1	5.6%
Secondary school graduate	1	5.6%
Obtained diploma	1	5.6%
University graduate	1	5.65%
Total	18	100.0

4.3 Open coding

Interview transcripts were analysed through breaking down the data obtained line by line, as mentioned in Chapter Two. This process continued and eventually 70 and 63 codes were created from the interviews with doctors and patients respectively (Tables 4.4 and 4.5). After coding each interview, initial codes were grouped into categories. Several new codes were re-titled and allocated to a different group, as needed. Another scan of the codes was performed to reduce any duplication within the concepts. When duplication was found, the codes were combined. For instance, ‘has heard of cervical cancer’ was combined with ‘has knowledge about cervical cancer’ under the category ‘patient’s information and knowledge’. Furthermore, codes were considered multiple times in terms of the aim to develop theory to inform the study intervention (Charmaz, 2006).

Table 4.4 Final list of codes from doctors' transcripts

Concepts	Free codes
Doctor's experience of CC	1. Seen women with CC
	2. Hasn't seen CC cases
	3. Rarely seen patient with CC
	4. Has seen cases of CC, but in the end stages
	5. Never seen CC in the end stage
	6. Women attended at the last stage of CC
	7. Seen patient with suspicious abnormality and referred them to the unit of early detection of CC
	8. Seen more than 10 CC cases in the last 10 years
	9. Doctors have no up-to-date knowledge of CC
	10. No experienced doctors in terms of CC
Current country crisis impact on the risk factors to cervical cancer	11. Believes risk factors of CC have increased such as, more than one partner
	12. Current crisis led to increased risk factors of STD & HPV
Smear test practice among doctors as a part of day to day duties	13. No smear test done in the health care centres
	14. Does smear test in case of offensive discharge or post coital bleeding
	15. Hasn't done smear test yet
	16. Does smear test frequently in her private clinic
	17. Done smear test to satisfy herself but not confident in its value
	18. Doesn't consider smear test is acceptable to be included as a part of her day to day duties because of the workload
	19. Consider smear test acceptable to be included in her day to day duties
Doctor's perceptions of smear test	20. Monthly cervical visualization much better than taking smear test
	21. Believes CC can be detected early using smear test
	22. ST not useful because of short time for development of CC
Training courses	23. Hasn't trained on smear test sample taking
	24. Has trained in smear test in Baghdad

	25. No training on cervical screening programme
	26. Trained herself from YouTube
	27. Trained just for two days in Azadi hospital
	28. Cytologists should be also trained
	29. Has trained on smear test in Dubai and India and Amman
	30. Cytologist and nurses should be also trained
	31. Learned from her practice in the outpatient department
Practical and health system barriers to CCS	32. A lot of speculums should be available
	33. Knowledgeable leaders needed
	34. Due to the recent crisis a huge number of refugee influx into Kirkuk city
	35. Financial burden of patient affects her attendance to ST
	36. Lack of women's knowledge
	37. Women do not attend to the hospital or health care centres unless they have pain
	38. Difficulty to access the hospital
	39. Lack of experienced doctors in terms of CC
	40. Lack of organisation of health system
	41. Women feel embarrassed
Management	42. Treatment plan for CC needed as well as SP
	43. No treatment facilities for CC
	44. Vaccination for HPV would be more useful
	45. Need centre for managing CC as well as screening
Doctor's willingness to establishing a National Screening Programme in Iraq	46. Willing to establish a centre for CS
	47. Need for local programme as cases present in the end stage when inoperable
	48. We have facilities to establish national screening programme
	49. We have a very high quality medical machine but nobody is trained in how to use it
	50. Not supporting the idea of NSP
	51. Strongly supports the idea of establishing NSP
	52. Not confident NSP can be successful
Doctor's recommendations for establishing a successful cervical screening programme in Iraq	53. Training is necessary before SP is launched in Kirkuk
	54. Education first, then facilities should be available

	55. Need for qualified cytologist
	56. Training courses for health care providers and staff
	57. Raise women's awareness through media and advertisements - doctors could speak about CC
	58. Make ST as popular as mammography through media, schools, colleges
	59. Practitioners should be trained to do ST
	60. Start from the antenatal care unites in the GPs
	61. Family medicine is important
	62. Emphasise the relationship between patient and health care providers
	63. Laboratory facilities should be prepared before SP launched in Kirkuk city
	64. Emphasis on the co-operation among health care providers
	65. Updating training courses every 6 months
	66. Treatment plan for CC needed as well as SP
	67. Increase women's awareness by distributing leaflets on ST among them
	68. Visiting home with vaccination team
	69. Histopathologists are needed
	70. National Screening Programme could be successful through media, primary health care centres, hospitals, ministry of higher education

Table 4.5 Final list of codes from patient's transcripts

Concept	Free codes
Patient's knowledge & awareness of cervical cancer	1. Has heard of cervical cancer (CC)
	2. Never heard of CC
	3. Has been told an ulcer in the uterus could progress to cancer
	4. Knows bleeding is a sign of CC
	5. Believes CC is a malignant disease
	6. Knows CC soon spreads when it occurs
	7. Believes CC is a removal of the uterus
Patient's perspective of CC	8. Believes CC happens suddenly without any cause
	9. Believes that nobody knows the real cause of cancer, even doctors
	10. Believes CC is a test from God
	11. Faith that CC is from God, without any reason
	12. Fear of the word 'cancer'
Patient's knowledge on the risk factors for CC	13. Believes that recurrent inflammation and ignores may cause CC
	14. Believes irregular cycle is a risk factor for CC
	15. Believes tubal ligation is a risk factor of CC
	16. No knowledge of the risk factors of CC
	17. Believes that anxiety and distress increase the chance of CC
	18. Heredity as a risk factor
	19. Illegal relationships is a risk factor
	20. Believes multiple childbirth may lead to CC
	21. Believes neglecting hygiene has an effect of getting CC
	22. Believes that working hard is the cause of CC
	23. Contraceptive measures increase the chance of getting CC
	24. Believes taking hormonal contraceptive pills is a risk factor of CC
Patient's perceptions of smear Test	25. No knowledge of smear test
	26. Doctors told her smear test is a Cell culture
	27. Smear test is for detecting any abnormality in the uterus
	28. Smear test is a laparoscopy to examine the uterus
	29. Has heard of test for detecting BC but not Smear test
	30. Smear test is to examine the cervix
	31. Smear test is to detect cancer in the uterus
	32. Purpose of smear test is to check for any abnormality and to know if it is benign or malignant
	33. Scared because believed smear test meant taking something from her genital area
	34. First time having smear test
	35. Believes CC could be prevented by smear test
	36. Smear test is a swab taken from genital area
	37. Believes smear test is good to make sure about her health
	38. Believes every women should be checked to detect any abnormality the same as checking for BC
	39. Believes smear test is for pregnancy, not for CC prevention

Patient's knowledge on the purpose of smear test	40. No knowledge of the purpose of smear test
	41. To check for any abnormality and to know if it is benign or malignant
	42. Polyp over the cervix was reason behind attending for smear test
	43. Smear test to detect cancer in the uterus
	44. Been told by the doctor that smear test is to detect any inflammation in the uterus
	45. No knowledge of possibility of prevention of CC by smear test
Factors enhanced the uptake of cervical cancer screening	46. Neighbours encouraged her
	47. Ulcer and inflammation of the uterus were the reason behind her smear test
	48. Has had smear test because her sister suggested it
	49. Recurrent infection was the reason behind attending to the smear test
	50. Motived to have smear test by doctor's recommendation
Barriers to cervical cancer screening	51. Women have no knowledge of the availability of smear test
	52. Nobody suggested smear test
	53. No idea and nobody recommended it
	54. Believes smear test is just for unhealthy women
	55. Lack of knowledge influences lack of attendance to have ST
Doctors and their influence	56. Doctors should recommend smear test
	57. Has not seen any doctor speaking seriously about CC
	58. Suggest doctors speak about CC on TV
Willing to participate in CCS	59. Willing to know more about CC
	60. Willing to have screening available in Kirkuk
Patient's suggestion to improve CCS	61. Health care centres are her place of choice to have smear test, the same as antenatal care or vaccination
	62. Suggest advertisement on the TV to improving screening behaviour among healthy individuals
	63. Suggest leaflet as a good source of information for women attending the health care centres

4.4 Axial coding

At this stage, axial coding was conducted in order to organise free codes into major categories. In some instance, sub-categories were created within major categories. Also, at this stage I began to relate emergent categories to each other (Corbin and Strauss, 2008). Originally, ten categories were created from the interviews with the patients and doctors independently. Following reflection on every category, both groups of categories were integrated. For example, the categories labelled ‘women’s suggestions to improve cervical cancer screening’, ‘gynaecologist’s recommendations to establishing a successful screening programme’ and ‘establishing a national screening programme in Iraq’ were grouped into ‘National screening programme in Iraq and future needs’. The final results comprised nine major categories.

The following sections characterise the data in each category, supported by verbatim quotes from the respondents.

4.5 Categories emerging from interview analysis with doctors

Eight categories were identified from interviews with the doctors, as reported in Table 4.6 below.

Table 4.6 Categories and descriptions (from interviews with doctors)

Categories	Descriptions
Doctors' experience regarding CC	Knowledge of doctors regarding cervical cancer
	Individual practices in cervical cancer cases
Shortage of trained staff	Attendance at appropriate training courses
	Doctors perspectives of the training courses
Smear test practice among doctors	Doctors' perceptions of smear test
	Doctors' behaviour and attitude to smear test
Barriers to CCS uptake	Health system barriers
	Factors that influence the uptake of CCS
	Embarrassment
Current country crisis impact on the risk factors to CC	Discussion related to the current country crisis and the potential factors influencing cervical cancer prevalence
Management	Strategies to facilitate treatments Vaccinations
Current country crisis impact on the need for a National Screening Programme in Iraq	Doctor's recommendations for establishing a successful screening programme
	Family medicine & antenatal care
	Relationship between patients and health care providers
Identification of future cervical cancer care needs	Raising women's awareness of screening options
	Health professional education
	Promoting cervical screening infrastructure and care services

4.5.1 Doctors experience of cervical cancer

The interviews with the doctors varied in length (duration), due to the nature of their work and their individual experience. Accordingly, their responses to the questions and

the discussion of the topics varied. When the doctors were asked if they had ever seen women with cervical cancer, most doctors had seen women with late-stage cervical cancer. Only one doctor had never seen a case.

'I have seen, but we refer them and mostly we see them during the end stages, they run to the end stages that is the problem because there is no screening, we are seeing them in the end stage and there is no hope! Hopeless case'

Two doctors admitted a lack of experience in terms of cervical cancer.

'Never seen cervical cancer during the end stages but have seen the early stage CIN1 and referred them for Smear test '

One of the doctors expressed her concerns about doctors' current knowledge of cervical screening, saying:

'let me tell you because we don't see numerous cases we don't have up to date knowledge about the disease, for instance when I face such cases I will return to the book to read more about it for example, I graduated as specialist gynaecologist in 2000, we had a unique outpatient in Baghdad for colposcopy so we were reading more and searching more up to date information but now here is so different'

This finding reveals lack of baseline information on the cervical screening. Doctors mainly expressed the need for educational programs and guidelines on cervical cancer and cervical cancer screening.

4.5.2 Shortage of trained staff

Many doctors indicated that they had not attended any training courses on the smear test, although three of them had attended a local training course held by a doctor in a local

hospital over two days, comprising one day of theory and one of practice. Most doctors had learned smear test during their practice in the outpatient clinics without any formal training:

‘No I haven’t, I have just learned from my practice in the outpatient or in the unit of colposcopy’

Three of them were trained outside the local area, in two cases outside Iraq.

‘Yes, in XX teaching hospital in Baghdad’

‘Yes, I had about 1 week in Dubai and 1 month in India and also in Amman’

One of the doctors trained herself using videos from YouTube:

‘No training, I have trained myself from the YouTube, well done, this is a good study to recommend training for us (laughing)’

In general, all interviewed doctors reported lack of training and expressed a desire to attend more training courses on smear test and cervical cancer screening programme.

4.5.3 Smear test practice among doctors

All doctor participants were asked about the use of smear tests in their practices. All except two had performed it; one of these was a recent graduate.

R: Can you tell me about the use of smear test in your practice?

‘I haven’t done it yet, but I read that these patients should be referred to urinary medicine but we don’t have such unit here, when I was in XXXX during my studies, they had a special unit for Smear test’

Another was a general practitioner who was working in the health care centre where smear test is not available:

'We don't have smear test here in this centre'

The findings show many of the doctors referred to smear test as a diagnostic test, for instance most of them indicated that they used smear tests in cases of cervical erosion, offensive discharge or postcoital bleeding.

R; Can you tell me about the use of smear test in your practice? Is this something you offer?

'Indeed I am doing smear test for every suspected case of cervical erosion, especially after 30 years old or even before that age if the cervix has ugly or abnormal shape'

'Yes, if the patient has offensive discharge or postcoital bleeding'

Another doctor stated that she was only offering smear test for healthy women if the patient had an *'unhealthy cervix'*.

'Not usually unless if she has unhealthy cervix or has a problem or if she complains of any risk factors'

Risk factors were recognized by another doctor as an indicator for doing a smear test:

'In my practice when I see women with PID (Pelvic inflammatory disease) or cervical erosion or early marriage age I always advise them to do the test, but there is no screening in Iraq'

One doctor talked about her experience in UAE:

'In UAE I was working there and in our OPD (Outpatient Department) we were doing everything and we were seeing all gynae case, so we were doing Smear test for any patient if there was any abnormality, like patient with cervical erosion or suspicious cervix immediately and if there was any abnormality we were doing colposcopy, this was all in the same department even in the same room because seven doctors were sitting in the outpatient at the same time, not like here, here is different'

This doctors described her experience with smear test saying *'I am doing it just to satisfy myself before doing cervical cauterization, but I don't think it is very helpful in early management or to decrease the risk of cervical cancer, no it is not like that'*

Other doctors described their smear test practices in their private clinics.

'Yes, in my clinic I do smear test but in health care centres I won't be able, couldn't perform it, because we have no facilities'

'Yes I do [it] every day for my patients in my private clinic and maybe in the hospital for the patients above 21 years, sometimes I do this as a routine for them and sometimes for the patients who have infection or recurrent cervical erosion or post-menopausal bleeding'

Almost all doctors agreed that cervical screening should be included as a part of their daily professional duties.

[4.5.4 Barriers to cervical cancer screening uptake](#)

This theme emerged from the interviews with both doctors and women. Besides the obvious barrier regarding lack of knowledge (described in the previous theme), barriers

related to the health system and the factors that have an impact on the cervical screening uptake among women were important issues discussed by both doctors and women.

Many doctors pointed to the lack of organized healthcare services, lack of knowledgeable leaders and lack of doctors experienced in CC as barriers to CCS uptake.

‘Our health system is not arranged and this needs a well-planned health system. So, first of all, this should be start from the GPs and the general practitioners should be well trained to perform the Smear test ’

Lack of health care professional was indicated by some doctors:

‘But you know when a doctor has a call she will be tired for the next two days and she will have outpatient calls for pregnancies three times a month and most of the women have come for Caesarean section so, I can say that we are working about 50% scientifically in the outpatient because we don’t have time and there is lack of staff. In addition to all of this I have operation list once a week’

The cost of the smear test was mentioned by two doctors and another cited the recent refugee crisis as a barrier.

‘First barrier is the cost, for example I am seeing a lot of cases in my private clinic so if she is poor I will ask her to come to the hospital to do a smear test but she might not agree to come to hospital because she can’t go out another day either because of her house and family commitments or because I will not be available at the date that she will be able to come over to hospital’

'Yes, yes there is a serious need because due to the recent crisis a huge number of refugee influx into Kirkuk, Iraq and a lot of things happened like illegal relationship. I don't know if this is due to poverty or unawareness'

Apart from this, one of the doctors mentioned women's embarrassment as a barrier. This doctor clearly felt frustrated at being unable to detect the disease earlier and so have a greater chance of treating women.

'I had three cases, with regret they passed away, they had postcoital bleeding but were embarrassed to say and then they came to us at the end stage of the disease and [we] couldn't control the disease, even though we did all the therapy including radiotherapy. Because the life survival of cervical cancer is just five years, one of these patients passed away during the first years and the other (poor her) during one and half year of the disease also, the other one passed away in the 3rd year and all three were very young'

The majority identified the lack of awareness among women and women's misunderstanding of the smear test.

R: In your experience, do women request screening?

'Never and when have I suggested it they ask is if this would be with general anaesthesia (laughing)

Lack of information and its effect on screening uptake was mentioned by another doctors:

'Never , because they don't have any information, they don't know the simplest things because we don't have any health awareness or public health education, for

instance we have here in XXX hospital a unit named ‘the unit of early detection of cervical cancer’, but when you enter the room nothing shows that is related to cervical cancer or Smear test . We see women and give them contraceptive measures or any other silly things. For instance, I have one day call every week in this unit so when I am there I want to see cases with cervical abnormality or I want to look for the cases but what happens, women or patients come and asked me to do ultrasound for them to see if they have any ovarian cyst or any other gynaecological cases, rather than cervix abnormality’

In relation to this point, one of the doctors stated that women were afraid of the test because they might think it indicated cancer.

‘When I do Smear test patients are afraid and ask if there is something wrong or if I suspect cancer, but I explain for them that this is normal and every women must present to perform to detect any abnormality’

The present theme disclosed a wide variety of obstacles to cervical screening uptake mostly related to the poor organized healthcare services, lack of qualified health care professionals and unawareness of women of the cervical screening. However, embarrassment and fear of the test among women living in Kirkuk, Iraq has also shown to have an impact on the cervical screening uptake.

4.5.5 Current country crisis impact on the risk factors to cervical cancer

The common issue raised by the doctors was that the risk for cervical cancer had increased with the recent crises in the country.

R: Do you think that more women should be encouraged to be screened?

Yes

R; Why?

'Yes, especially currently as the risk factors for cervical cancer have been increased, I mean such as, multiple partners and the risk of HPV. I think the disease was uncommon previously but currently it has become more common, we see there is an increase in both the incidence of cervical cancer and the rate of the risk factors'

Women having multiple sexual partners and travelling out of the country was mentioned by one of the doctors as increasing risk.

'Yes they should, because the cervical cancer is common in the world and our people go outside, so maybe there are multiple viruses or multiple partners'

Another doctors pointed to sexual transmitted disease (STD), use of the intrauterine contraceptive device (IUCD), divorce and multiple partners as risk factors.

'Of course women need to be encouraged for screening, those who have recurrent STD and those who have maybe a first and second husband they divorced, these problems and those who are using IUCD they are liable for many recurrent infections. So these women should be encouraged and those who have any ulcer or any erosion...'

One of the doctors indicated that cervical cancer is rare in the Iraqi culture because the main cause of cervical cancer is multiple partners, leading to presence of HPV. This doctor, whose main job is in family medicine, recently started her work as a manager of the Unit of Early Cervical Cancer Detection and she stated that the unit would reveal the undiagnosed cases.

R: Do you see patients with cervical cancer?

'Not yet, here no, but in my clinic I saw more cases, also in the primary health care centres I saw cases previously, you know the factors or the causes of cervical cancer are rare in our culture in comparison to Europe, because the main cause of this disease is multiple partners that cause HPV to be activated and also genetic

susceptibility also. 'Thank God' there is very little in our community but of course we have cases, but this unit will discover if we have cases or not, actually the hidden cases will be discovered'

The main focus of this theme was the widespread view of the doctors that the risk factors such as; sexual transmitted disease and HPV have increased with the recent country crisis.

4.5.6 Management Issues

Even though the aim of the interviews with the doctors was to explore their experience in terms of cervical cancer, smear tests and screening, many of them raised issues related to the standard treatment of cervical cancer. The lack of knowledge on managements and facilities limited the treatment they could provide when cancer was detected.

'The thing isn't just the screening, there should be a management plan for the abnormal cases, for instance if I have a patient with CIN1 or CIN2 how can I treat her because we don't have loop electrosurgical excision procedure (LEEP) here in Kirkuk city so I have to refer the patient to X City and this costs too much for the patient'

This doctor stated that currently she has a patient with CIN3 but there aren't management facilities to treat her.

'In fact I have a case now CIN3, but I am confused because we don't have good management facilities and we are not trained for the management'

Meanwhile, other doctors indicated a lack of doctors who were experienced in cervical cancer treatment.

'lack of the doctors who have experience related to cervical cancer, for instance if I diagnosed a women with cervical cancer I could not be able do anything so I will refer her to XX or if they are my relative or if they are wealthy I will advise her to go to Turkey because I am not experienced and we don't have facilities to treat CIN1 or CIN2,CIN3, so I can't venture and tell her come and I will do total abdominal hysterectomy for you and you will be cured, no I can't take this responsibility whatever happens because I don't know what will happen after that because we don't have facilities in our hospitals, so I won't be able to follow up them. So the problem is not just smear test or colposcopy, the problem is what happens if she is diagnosed with ca cervix'

This theme indicates the impact of knowledge on doctors' practices related to cervical cancer management, doctors emphasized on the need for knowledgeable leaders in terms of cervical cancer as well as the provision of management facilities.

4.5.7 Current country crisis impact on the need for a National Screening Programme in Iraq

The majority of the participants agreed on the need to establish a National Screening Programme in Iraq and a local screening programme in Kirkuk.

R: Do you consider that there is a need for a cervical-screening programme in Kirkuk?

'Yes, we have facilities I was in XX hospital and there was a very high quality medical machine but no one could use it because nobody was trained. We had a doctor there and she tried more than once to be sent for training but nobody cares, so yes I think this program is very important'

The same doctor emphasised the need for a local screening programme, as the exposure of women to risk factors for cervical cancer had increased.

Equally, two of the doctors considered establishing a screening programme important because screening was offered globally.

‘Yes, we should insist on this like European countries’

Another doctor linked a local screening programme with female problems, such as sexual transmitted disease and HPV.

‘Many problems they have, STD problems, is too much, and we are afraid of HPV and because we have no screen for this and no culture for this virus, so we are afraid and taking continuous smear test s many, many times and if we have any doubt about this problem I refer them to other cities or to neighbour countries’

In contrast, the idea of establishing a cervical screening programme wasn’t welcomed by two doctors, one was concerned that the current country crises might make establishment of a screening programme difficult.

‘Difficult because of the security situation’

Another said:

‘No, it is not helpful’

R: Why?

Why.... Because I told you

R: Prompt with deep breath:-

‘When the cancer happens and normal cell changes to cancer I think it is taking a very short time, not....that long time, this is first, the other thing because with little

cervix erosion they are doing cauterization in Iraq and that is why the cervical cancer in Iraq is very low, this is another point and this is useful, although the patients don't like it but it is beneficial for them'

Again I asked the same doctors how we could make this programme more successful.

'No I don't think it would be'

R: Could you tell me why?

'I told you because first financial burden, second to change to cancer cell it is taking a very short time, if the patient attending the outpatient every month it is better to visualize the cervix with each visit rather than doing smear test one time each year. So monthly cervix visualization is better than yearly smear test '

It is clear that most doctors demonstrated their willingness to establish a centre for cervical cancer screening in Iraq. However, variety of suggestions and recommendations has been raised regarding issues to be considered before the cervical cancer screening programme is launched in Kirkuk city.

4.5.8 Identification of future cervical cancer care needs

4.5.8.1 Raising women's awareness of screening options

As the lack of knowledge of cervical cancer and the screening programme were obvious barriers, participants were asked to recommend acceptable solutions that might help to encourage the uptake of cervical screening among Iraqi women. Educating women and raising their awareness of cervical screening were recommended by almost all the doctors to encourage women to undertake screening. They argued that the media, especially television, could play an effective role in educating women. However, one doctor also suggested making screening mandatory.

‘It would be successful if we raise the awareness of the women and insist on the women to attend to this test ‘

There was general agreement among doctors and women that talking about cervical screening in the media would encourage women to attend for screening and they claimed that this should start from the doctors in the health care centres

‘Raising women’s awareness and making advertisements on the TV, doctors could speak about the disease and the test on TV and encourage all women to attend the hospital to have the test’

‘Media and advertisement should start from the doctors in the health care centres to raise the women awareness’

One of the doctors suggested targeting the younger generation in the schools and colleges to increase awareness around cervical screening.

‘We have to rise women’s awareness and give them health tips, especially [asking] teachers to explain this to their students in the class activities and tell them not to be embarrassed to have the test’

Some doctors and number of women participants recommended using special teams to visit women at home to raise their awareness of the cervical screening

‘We should start from the health care centres or during visits to the women’s home when special teams are going to visit families home to vaccinate children against poliomyelitis’

This theme indicates the need for developing culturally appropriate interventions to enhance cervical screening uptake among those women who are less likely to be aware of the cervical screening.

4.5.8.2 Health professional education

The findings show that practical difficulties such as lack of trained staff were perceived as major barriers to establishing population based cervical cancer screening, as a result, the need for promoting the education and training of health care professionals was often expressed.

R: What do you think is necessary before a screening programme is launched in Kirkuk city for cervical screening?

‘Training courses especially for the health professionals they should be taught about the test and the requirements of the test such as, in what day of the cycle women should attend for this test and that they should be informed to avoid intercourse the day before and avoid douching. Also there should be qualified cytologist and there should be training for the cytologist also’

‘There should be training courses both theory and practice with continuous updating training every six months or annually for example and the trainers should have enough experience not only theory, I want to practice also’

The need for histopathology services was another issue raised by numerous doctors.

‘Histopathology is needed, especially we face problems with the same report whenthere is something wrong we send it to another histopathologist reader and we see another report extremely different from the previous one’

Laboratory and examination equipment were mentioned by others.

‘Facilities should be available like the laboratory and examination equipment’

In general, doctors reported the need for continuous educational strategies and training courses for the health care professionals to build up effective level of human resources to support the introduction of a cervical cancer screening programme.

4.5.8.3 Promoting cervical screening care infrastructure and care services

Despite the fact that the cervical cancer screening programme is not established yet in Iraq there was a considerable agreement among doctors in that the cervical screening should start from the health care centres.

This doctor suggested starting from the antenatal care and emphasised the family medicine role.

'...may be successful, if we start from antenatal care in the health care centres because many women are visiting there, it is near their house and family doctor is very important family medicine because if the family medicine doctors working in this field try to make their role active they try to make the screen positive and okay, we have family medicine doctors in the health care centres and they have no role, if they try to make their duty special centres for family medicine they will catch these problems earlier because it is a disaster problem, we are always seeing them in the end stage. Screening is a very good program but if we make it active according to our situation, I mean the security problems and the ignorance of women health'

In the same way other doctors who also suggested using the health care centres suggested cervical visualization at each patient visit to the health care centres.

'First of all, it should start from the health care centres and the cervix should be visualized at each visit, because most patients are poor and they cannot attend a private clinic, so a lot of sterile speculum should be available and sterile, any patient

with human papilloma virus should be send immediately for cauterization with the one of high risk for Smear test ok, so for such cases or patients, we should start from the primary centres ok, any suspicious case should be send to the hospital, and in the hospital a lot of speculum should be available, not two or three, and visualizing the case properly'

The charge for cervical screening services was also a common issue raised by most doctors. They believed that screening should be cheap or be offered free without any charge to improve women's access to the screening services.

'The screening should be offered by the health system and it should be cheap because if I suggest it in the private clinic most women won't accept to pay for the test unless she has got the disease and this I would not consider as screening'

(C,L172)

The importance of a connection between patients and health care providers was mentioned by one doctor:

R: What do you think about establishing a national cervical cancer screening programme in Iraq?

Yes indeed I agree

R: Could this be successful? How could we make it more successful?

'Why not, but we should stress on the connection between patients and health care providers and raise the health awareness among women'

The study findings show that there is high level of willingness among the doctors to establish an organized population based cervical cancer screening and doctors expressed a desire to establish a centre for cervical cancer screening:

‘I wish we could establish a centre for cervical screening and we are all willing to work on this even if it takes a long time or it is exhausting, at the end you feel that you offered some good service ‘

Whereas other doctors recommended an advanced centre for managing cervical cancer:

‘Advanced centre for managing the cervical abnormality that affects the women’s life’

A few doctors suggested starting vaccination against cervical cancer.

‘If the patient has HPV we have to do Smear test for her and we should try to bring vaccination for HPV, it is the most important especially for high risk patients because 95% of patients with cancer they have this HPV. So I think this is better than doing the Smear test ’

‘There should be knowledgeable leaders and we should start vaccination against cervical cancer’

All doctors who enrolled in this study agreed on the need to establish cervical screening services in Iraq and suggested to integration of these services with the antenatal care services which are already established in every healthcare centre in Iraq. The common presenting suggestion of the doctors was the need for establishing an advanced centre to cervical screening in Kirkuk, Iraq as well as starting vaccination against HPV for women living in Iraq.

4.6 Categorise emerged from the interviews with patients

In the following sections I describe the categories that arose from the semi-structured interviews with the patients.

Table 4.7 Categories and descriptions (from interviews with the patients)

Categories	Descriptions
Information and knowledge	Women's knowledge on cervical cancer
	Women's knowledge on cervical screening
Knowledge of the risk factors for CC	Women's knowledge on what can cause CC
Facilitators to access cervical screening services	Women's source of information
	Reasons for not attending for screening
Women's suggestions and recommendations	Women's suggestions to improve cervical screening uptake

4.6.1 Information and knowledge

When patients were asked if they had heard of cervical cancer and screening, the majority denied hearing about it or seeking any screening. Lack of knowledge was the main factor preventing them from seeking a screening test:

'No, I don't know anything about it, they told me that this is a mass and you might get bleeding from the uterus and I heard some women have had their uterus removed'

'No, [I have] not read about it and not heard from others'

Some participants had faith that cervical cancer was a punishment from God and would occur without reason.

'Don't know, I say it is from God without any reason'

'Nobody knows the real cause of cancer, even the doctors, it happens suddenly without any cause'

Almost all the women refrained from using the term cancer.

'To see if women are having that disease!'

'No, thank God we never had this disease'

I asked women participants who were attending for a smear test about their understanding of the test. Participants indicated that their doctors had given them a range of reasons for the smear test

R: What do you understand by the term 'smear test'? Why is the smear test done?

'It is a swab taken from the genital area'

'To check if there is any inflammation in the uterus, as the doctor told me'

One participant blamed doctors for not giving her information about the test:

'I heard about testing for detecting cancer in breast by doing an X-ray. We are often going to women doctors and they never told us about the disease, just in the end stage if they diagnose us as having any bad disease in the uterus, then they ask us to get rid of it'

Another participant believed that smear test was used to detect infection or check for pregnancy.

'Tests always done for every woman to check for any infection, for example, urine test or blood test to know if the woman is pregnant or not.'

Several women believed that smear tests were just for unhealthy women.

'No, I think just unhealthy women or woman with breast cancer should do this test'

However, many reported hearing about breast cancer screening, rather than cervical screening:

'Yes, I think every woman should be checked to detect any abnormality the same as checking for breast cancer.'

In a similar manner, several doctors indicated that most women were aware of breast cancer screening and mammography:

'Yes why not, for instance we see a lot of women coming to the hospitals and asking for mammography they even say the name of the screening they don't say for example x-ray for breast. So increasing the awareness of the woman for cervical screening as well is so important to be most common like breast cancer screening'

However, when women were asked about what influenced them not to have the smear test or screening, 15 out of the 18 interviewed women believed that it was not possible to have a smear test, because they were unaware of the availability of the test in the city hospitals.

R: Why do you think most women living in Kirkuk don't attend to have smear tests?

'They have no information and no one suggested it'

'[I] have no idea about it and if I had, for sure I would have done it, for instance my sister told me about breast screening so I have done it'

One of the participants who had colon cancer said:

‘Before that disease nobody has told me, but when my doctor suggested it I went to hospital and [I] have done it’

Furthermore, most of the interviewed women pointed out the negative impact resulting from doctors not informing women about cervical screening. This was seen as a barrier and was raised by all the participants.

‘Always I go to the doctors but no one suggested it’

This finding indicate that most participants have no knowledge of the risk factors for cervical cancer including those who had presented for a smear test

4.6.2 Knowledge of the risk factors to CC

When women were asked if they had ever heard of the factors that increase the risks of cervical cancer, many women believed that recurrent infection might lead to cervical cancer.

R: Have you heard of anything that could increase the chance of a woman getting cervical cancer?

‘Oh God, there are some woman get this disease because of frequently and recurrent inflammation because they ignore [it], it is important that every woman should go to the private clinic to check for any inflammation at least every two months, this is my opinion’

While more than half of women participants had no idea of the risk factors, they expressed their willingness to know more.

‘I don’t know and would like to know’

Few of the participants mentioned contraceptive measures, abortion and childbirth as risk factors.

'I think using contraceptive measures and recurrent abortion may lead to this disease '

'I think multiple childbirths may lead to this disease because my mother had this disease and had nine childbirths'

Another suggested that irregular menstrual cycle, heredity or taking medicine might have an effect:

'Maybe neglecting for instance if she has a pain and ignores it or irregular cycle, also heredity may affect, also some medicine might have an effect'

One of the participants mentioned hard work as a risk factor:

'Don't know, but I know my relative got this disease because she worked very hard in her life, she was raised in a village and worked as a farmer so this might be the cause of her disease'

Anxiety was also mentioned by one participant:

'Yes anxiety and distress increase the chance. I don't know but my sister got it because she lost her husband and her son in a car accident so the doctor told her she got the disease because of her psychological status'

This finding indicates that most participant who had and did not have ST have no knowledge on the risk factors to cervical cancer.

4.6.3 Facilitators to access cervical screening services

The findings show that the patients were not aware of the availability of cervical screening and argued that it was the health care provider's responsibility to inform them

about the test. In most cases patients also stated that they did not know about the use of smear test as a tool for early cervical cancer detection.

'Have no idea about it'

'Don't know anything about it'

R: Why do you think most women living in Kirkuk don't attend for smear tests?

'Nobody suggested it and women have no information about the availability of the test'

'Women should know everything and I prefer doctors to suggest it'

Most of the women stated that this was their first smear test, and when they were asked what influenced them to undertake a smear test, the majority indicated that recurrent infection, ulcer or polyps was the reason that their doctor had advised having a smear test.

'This is my first time; the doctor has told me because you had a uterine mass so you should go to do this test'

'My doctor asked me to do it because I have a polyp over my uterus'

Another patient indicated other reason for her attendance for a smear test.

'I have an ulcer and inflammation in the uterus since three years ago and my doctor told me to do this test'

However, one of the participants who was already diagnosed with cervical intraepithelial neoplasia1 (CIN1) stated that this was her fourth appointment to have a smear test in order to reveal any progression in the disease.

'To see if there is any progress in the abnormality of the cell and if there is any prognosis'

Another woman who had been diagnosed with colon cancer previously indicated that this was her second appointment

'Yes, but I wouldn't have done it unless the doctors diagnosed me as a patient with colon cancer'

One of the patients referred to illiteracy as a reason for not attending for screening:

'Don't know because I can't read'

Lack of information was indicated by most patients.

'Have no idea about it and if I had for sure I would have done it, for instance my sister told me about breast screen so I have done it'

One of the participants spoke about neighbour as a source of information:

'I heard from my neighbours that women goes to X or XX City to do tests but don't know the name of the test'

In Iraq, women are not individually invited to screening and no awareness campaigns have been carried out by the Iraqi Ministry of Health to raise women's awareness. These findings show that doctor's recommendation was the main source of information for women to attend smear test.

4.6.4 Women's suggestions and recommendations

Most patients emphasised the doctors' role in informing women how to access the screening services:

'Doctors must inform every woman and must emphasise that this is an important issue so doctors should tell every woman, for instance if they haven't told me about this I would never have known it'

Several patients as well as some doctors recommended developing leaflets on cervical screening; its purpose, the procedure itself and when it should be performed.

'Distribution of a leaflet among women attending the health care centres or, for example, doing the same as they do for vaccinating every child against poliomyelitis by visiting the women in their houses'

In the meantime, most women suggested doctors talk about the screening on television.

'Make advertisements on the televisions and doctors should speak about this test'

'Doctors should suggest it or talking about it on the TV. I haven't seen any doctor talk about this disease seriously'

Overall, all participants wanted to know more about cervical cancer and cervical cancer screening. The main recommendation was doctors should talk about CCS in the media.

4.7 Discussion

4.7.1 Factors impacting the access to cervical cancer screening among women living in Kirkuk, Iraq

The purpose of this study was to develop a better understanding of the factors that might affect the implementation of successful cervical cancer screening in Kirkuk. In this section I will discuss the findings of the qualitative study in the context of other literature.

To the best of my knowledge this study is the first to focus on the perspectives of women and health care professionals on cervical cancer screening in Iraq. Multiple factors were found to have had a direct or indirect influence on the women's access to cervical screening. While many factors were found to be important in the cervical screening access process, it became clear that they were actually less influential compared to the main essential central factor, which is the absence of regular organized cervical screening programme. The general practitioner whom I interviewed in the general practice centre revealed that Smear test is not available at the primary health care settings in Iraq.

Due to unavailability of a population based cervical cancer screening programme in Kirkuk, women's stories were quite similar. In general women were very poorly aware of cervical cancer and they were unaware of cervical cancer screening unless their doctors recommended it. Studies by Hwaid and Haseeb (2013) and Saadoon *et al.* (2014) have also highlighted insufficient awareness of smear test among women in a different region in Iraq. In addition, many researchers have argued that one of the main issues of cervical cancer screening in most Arab countries is the lack of awareness among patients and health care providers (Badrinath *et al.*, 2004). So far the findings of this study provide evidence that, even though it might be expected that those patients

who had been referred for a smear test would have been aware of the purpose of the test, in fact most of them were not. There were many misconceptions about the purpose of the test. It is notable that the only respondent who was aware of the purpose of the smear test was a university graduate who had been already diagnosed with cervical cancer. The overall poor knowledge on cervical cancer and cervical cancer screening in this study may be related to the participants' level of education, as nearly 16.75% of the participants had not attended school and a further 50% had only primary school education. The finding of this study is similar to a study from Jordan by Barghouti *et al.* (2008), who reported women were more likely to be aware of cervical cancer and cervical screening if they had higher than secondary school education. Authors of a Kenyan study, who investigated the knowledge and practices about cervical cancer and smear test among patients in Kenya, reported that the illiteracy rate among cervical cancer patients (29%) was six times higher than the rate of (5%) among the general population of women aged 15-45 years (Gichangi *et al.*, 2003). This suggests that women who develop cervical cancer have not benefited from the overall increase in literacy level in Kenya. This means illiterate women are less likely to know about cervical screening. This study reported that there is no population-based cervical cancer screening programme in Kenya and that most cervical cancer cases present with advanced disease stages (Gichangi *et al.*, 2003). To attend the programme, women need to be aware of the disease and techniques of early detection and prevention. There are several studies indicating that knowledge on cervical cancer and smear test influences the uptake of cervical cancer screening services (Taylor *et al.*, 2001, Obeidat *et al.*, 2012). Roberts *et al.* (2004) have found a positive relationship between the education level and awareness of cervical cancer. Considering the educational level, studies have indicated that one of the factors that contributes to high cervical screening rates is a high level of education in women (Erbil *et al.*, 2010)

These findings confirm the importance of the interaction of the health care professionals with the women to raise their awareness on the need for cervical cancer screening, especially as women in this study stated that they would be more likely to go for screening if their doctor recommended it. This suggests that doctors have a strong part to play in encouraging women to undergo regular smear tests and women may rely more on their health professional's advice when they have little access to information themselves, either due to lack of availability or lack of literacy. Previous studies from WAMEMs have reported that the recommendation of doctors is the most acceptable (Amarin *et al.*, 2008, Obeidat *et al.*, 2012, Sait *et al.*, 2012). It has been indicated that health care providers' recommendations are powerful predictors of cervical cancer screening (Amarin *et al.*, 2008). Doctors need to offer clear explanations and identify the importance of the cervical screening in a way that is accessible for all women.

In many Arab countries, cancer screening is recommended for diagnostic purposes rather than using it as a preventive tool (Salim *et al.*, 2009). This is consistent with the findings of this study, as many of the doctors referred to ST as a diagnostic test and the majority of women interviewed believed that smear test was performed only on unhealthy women, rather than for early detection of cervical cancer. A likely explanation for this is that in the absence of organised cervical screening programme. Smear testing takes place mostly in the circumstances of gynaecological visits as a part of a consultation for another illness. The national health care delivery system in many Arab countries mainly focuses on treating symptoms rather than preventive health care, which may have a negative impact on women's health practices (Salman, 2012). Such misconceptions require an extensive public education, with an emphasis on the crucial fact that smear testing is targeted primarily at early detecting precursor lesions and thus subsequent timely treatment would disrupt progress toward invasive cancer

(Sankaranarayanan *et al.*, 2005). Arab women perceive good health to be the absence of visible signs and symptoms, which may be a barrier to early detection and may therefore lead to the progression of the disease (Khan and Woolhead, 2015). Although in this study women were willing to adopt screening and compared it to breast cancer screening, it is evident that the Iraqi community requires culturally appropriate education to raise awareness that cervical cancer could be prevented with regular screening. Educational strategies must also extend to health care providers to ensure that they are sensitized to the systematic barriers to cervical cancer screening that the Iraqi women might face. In Iraq most women visit doctor's private clinic when they or their family members are ill. Thus, the physician-initiated discussion on cervical cancer is essential and it might be the only opportunity for those women to be educated about cervical screening. According to the World Health Organization, the health care system in Iraq has been on a centralised, curative and hospital-oriented paradigm; this system has lacked the capacity to deliver the services that addresses the major health problems faced by the majority of the population in a sustainable and equitable pattern (World Health Organization , 2017b). The current structure of primary health care centres is not capable of responding efficiently to the growing health needs of the population (World Health Organization , 2017b).

Most of the women interviewed had a belief that cervical cancer was a punishment from God. In fact women often avoided the word cancer and mostly identified the disease by other words such as 'that disease' Similar findings were reported by Banning *et al.* (2009), who stated that Arab people consider cancer as a fatal disease and perceive it to be a death judgment. This negative attitude towards possible treatment for cervical cancer needs to be addressed, to counteract the lack of reproductive health awareness among women in most Middle Eastern Arab Muslim countries combined with cultural

stigma associated with the word ‘cancer’ (Ortashi and Al Kalbani, 2013). Cultural factors among Iraqi women may present a difficult challenge in establishing cervical cancer screening programme in Iraq, therefore, health care providers such as general practitioners and doctors need to do their part in promoting cervical cancer services in culturally appropriate ways to educate women about cervical cancer risks, prevention and early detection to promote their uptake of screening. In most WAMEM countries, most of gynecological cancers are diagnosed at later stages (Salman, 2012). Lack of reproductive health awareness particularly among older women combined with the cultural stigma of seeking medical advice for gynaecological symptoms typically resulted in late presentation of all gynaecological cancers (Ortashi and Al Kalbani, 2013). Most of women with post-menopausal bleeding are either not aware of the seriousness of this type of bleeding or hesitant to seek advice and treatment because most of them are embarrassed to discuss reproductive issues at this age (Ortashi and Al Kalbani, 2013). Similarly, many of young women with postcoital or inter-menstrual bleeding would not seek early advice for the same reason (Ortashi *et al.*, 2013). It has been suggested that the availability of a non-cytological screening method not requiring a vaginal speculum examination may reduce screening embarrassments (Wright *et al.*, 2000).

Self-collected screening methods may be expected to increase access to screening in many poor resources countries where there are limited numbers of clinicians trained in performing speculum examination (Wright *et al.*, 2000). Swabs, brushes, and lavage devices have been used as self-collection tools (Wright and Kuhn, 2012) and self-sampling may have significant implications in countries where cultural and programme barriers may limit access or acceptance of cervical cancer screening (Snijders *et al.*, 2013). A randomized controlled trial exploring HPV self-sampling as an alternative

strategy for cervical screening in non-respondent women found 99% of 96 returned HPV self-samples to be adequate for analysis (Szarewski *et al.*, 2011). Previous studies conducted in the UK, Canada, and Netherlands have reported benefits of HPV self-sampling, including perceived convenience and reduced embarrassment and discomfort by avoiding gynaecological examination (Cadman *et al.*, 2014). Evidence from a recent study conducted in the UK suggest that psycho-educational interventions that increase HPV- related knowledge, perceived capability to HPV self-sampling will be needed (Williams *et al.*, 2017). Review of literatures, shows that HPV self-sampling is a promising alternative for screening in under-resourced areas lacking medical services for women who are reluctant to participate in screening (Snijders *et al.*, 2013)

Although these findings indicate gaps in knowledge related to cervical screening, my findings revealed that a common view of the doctors who participated was that the risk factors for cervical cancer and sexual transmitted disease had increased with the recent crises within Iraq in general and specifically in Kirkuk. This finding is consistent with the prevalence of *human papillomavirus* in women with abnormal Smear test s in Kirkuk City. A recent study by Mohammed and Rifat (2015) investigated 55 abnormal smear test samples from women attending hospital and private clinic in Kirkuk, and found that HIR-HPV was positive in 58.2% of patients. This high figure is in sharp contrast to those in a previous study aimed at identifying factors linked to the prevalence of cervical premalignant and malignant lesions among women living in Baghdad, Iraq (Al-Ani and Al-Hadi; (2000). In this cohort study which was conducted on 302 women attending a Gynaecology and Obstetrics outpatient clinic in Baghdad, only 1.35% had pathological changes due to HPV infection. The possible explanation for this is the situation of women post country war, since the invasion of 2003, displacement actually placed women and girls in extreme danger (Al-Ali, 2005). A report by the international women's organization (MADRE) reported a sharp rise in

rapes and sexual slavery among women in Iraq (Al-Ali, 2005). However, other factors such as the population growth and different location may have played a part in the differences in rates of diagnosed HPV infection. Over the past few decades rapid demographic and epidemiological transitions have occurred in Iraq. The population of Iraq was estimated to be 32.2 million with annual growth of 2-3% in 2013 (Al Hilfi *et al.*, 2013) compare to 36.94 million in 2016 (World Health Organization , 2016). The country faces noticeable health challenges particularly in the function of health system as the political instability and violence continues after decades of war and occupation (World Health Organization , 2016).

4.7.2 Barriers to cervical cancer screening CCS uptake

The main reasons for women not attending for cervical screening were unavailability of an organized population based cervical screening and absence of interventions targeted at women to encourage the uptake of smear test . This finding is supported by a study on the gynaecology services in Arab countries in which the authors found that cervical screening in Arab countries range from opportunistic screening, at best, to no screening at all (Ortashi and Al Kalbani, 2013). There is no established cervical cancer screening in any of the Western Asia Middle East Arab countries except the Emirate of Abu Dhabi: the majority of women with cervical cancer are diagnosed in the late, advanced stages of cancer (Ortashi and Al Kalbani, 2013).

Addressing an underlying lack of promotion of screening services to target *all* sexual active women is an issue of great need, however lack of qualified health care professionals and health system related barriers were also obvious. This finding is supported by Shabila *et al* (2012), who reported poor organization of health services delivery in Iraq with poor governance and leadership in the Iraqi health system. To address these issues, changes to health policies are

required, however this may be difficult in a health service where there are clearly failures in policy processes (Shabila *et al.*, 2012). Nevertheless, these findings do suggest values, themes and potential barriers such as stigma and fear of the word of cancer that need further exploration in order to gain the necessary understanding to offer culturally acceptable cervical screening to women in this community.

4.8 Conclusion

To summarize, in this chapter I have presented the results of the qualitative study (Phase two), indicating the factors effecting the implementation of successful cervical cancer screening in Kirkuk. I have also discussed the main findings of the qualitative interviews. In the next chapter I will present the findings from phase three, with a discussion of those findings.

Chapter Five

Phase 3 -The Quantitative Study

5.1 Introduction

This quantitative study was conducted as a result of the findings arising from the qualitative analysis of interviews with health care professionals (Phase two), which indicated there was both a lack of knowledge and practical challenges facing healthcare professionals working in cervical cancer screening units. The findings were used to identify key messages from which the intervention programme was developed, to promote the use of cervical cancer screening to prevent cancer and to establish a population-based cervical cancer screening programme in Kirkuk, Iraq.

Cervical cancer screening activities in Kirkuk are carried out through a small unit established by the Ministry of Health, for the purpose of early detection of cervical cancer. At the time of this study there were just two doctors working in this Unit: one was a consultant gynaecologist who was trained on cervical cancer screening in the UK, the other a family medicine doctor (untrained on smear test or cervical screening). These doctors were supported by one non-specialist nurse. The doctors reported that commonly smear testing was performed for unhealthy women who were referred by other gynaecologists if they suspected any abnormality in the cervix, which is not consistent with the use of smear testing in a screening context (Peterson *et al.*, 2008).

As was thoroughly discussed in the first chapter of this thesis, the use of cervical cancer screening can reduce the incidence of cervical cancer (Sankaranarayanan *et al.*, 2005, Denny, 2012b). However, a report from a consensus conference on cervical cancer

screening and management by Miller *et al.* (2000) revealed that training of health care professionals on smear taking and cytology reading, as well as continuous quality control of their work, are the basic minimum requirements that must be met in order to run a screening programme. In addition, the current European guidelines have been expanded to include comprehensive updates on technical details as well as automated interpretation of smear tests and testing for HPVs (Arbyn *et al.*, 2010a) as part of the requirements of a cervical screening programme. The updated guidelines included extended instructions prepared by a multidisciplinary team of expert gynaecologists, general practitioners and cytopathologists. Significant attention has been allocated to organised, population-based programme policies which minimise adverse effects and maximise benefits of screening. It is hoped that this expanded guidelines edition will have a greater impact on countries in which screening programmes are still lacking and in which opportunistic screening has been preferred in the past. A further addition was the inclusion of the measures for monitoring programme performance and characterizing potential problems in advance (Arbyn *et al.*, 2010b).

In order to be appropriately prepared prior to this phase of the study, the researcher attended an introductory training course on cervical cancer screening at Birmingham City University (BCU) and Birmingham Women's Hospital. Subsequently, in order to promote the performance of smear tests among gynaecologists, general practitioners and nurses in Kirkuk, and with the agreement of BCU to share their training resources, a comprehensive training course was organised. This intervention, implemented over two days, was designed to deliver information on current practice in cervical cancer screening in the UK and to increase knowledge of cervical cancer screening programmes among gynaecologists, health care practitioners and nurses. The intervention was a collaboration between the BCU team, the researcher, a consultant

gynaecologist and a cytopathologist from Azadi teaching hospital, Kirkuk. Permission to conduct this intervention was given by the BCU team and the administrator of Kirkuk Health Directorate (Appendix D).

5.2 The intervention

As stated, agreement had been given by the Cervical Sample Taker Introductory Training Course team from BCU to share some of their training resources. The researcher prepared the programme for the training course and this was reviewed for appropriate content by two consultant gynaecologists, a cytopathologist from Azadi teaching hospital, two nursing experts (one from Plymouth University and one from the University of Birmingham College of Medical and Dental Sciences), along with a Biomedical Scientist from Plymouth University. Feedback from this group of professionals was used to revise and amend the program, for example by including additional information on the HPV vaccination. The key elements of the training programme are detailed in Table 5-1: these include background information on the risk factors for cervical cancer, history of cervical cancer screening, technical and practical information regarding sampling and examination of the sample, and information on the HPV vaccination.

Table 5-1 Key elements of the training and education programme (adapted with permission from Birmingham City University and the Birmingham Women’s Hospital)

General topic	Details to be included
Background information on cervical cancer and the risk factors	Viral infection-particularly HPV16,18,31,33 Smoking Immunosuppression Non-attendance for cervical screening
Recommended routine screening intervals	25 First invitation 25-49 three years 50-64 five years, 65+ Only screen those whose last three tests included an abnormal result, or women who have never been screened and request a test
Eligible women age for cervical screening	Those aged between 25 and 64
History of cervical screening	Cervical screening was introduced in England

	<p>in 1964</p> <p>1995 data was published demonstrating that cervical screening reduces the incidence of mortality of cervical cancer</p> <p>1988 computerised call and recall system was established</p> <p>1996 guidelines were published for the Quality Assurance(QA), Reporting guidelines and Colposcopy management were introduced</p> <p>2003 the screening programme switched to LBC, standardises the frequency of screening and increases age of first invitation from 20 to 24.5(In England)</p> <p>2007 Cancer Reform strategy announces that all women will receive the results of their cervical screening test within two weeks by 2010</p> <p>The area of metaplastic squamous epithelium located between the original SCJ (squamocolumnar junction) and the new SCJ)</p>
The indicators of the transformation zone	
The basic principle of performing colposcopy	Short video on the use of colposcopy to identify and treat the pre-cancerous abnormalities which histologically is confirmed as CIN
Liquid based cytology procedure and technique (how to obtain the sample)	Short videos on the liquid based cytology procedure
Elements to ensure the effectiveness of cervical cancer screening	<p>Identification and invitation of eligible women at appropriate screening intervals</p> <p>Eligible women are those aged between 25 and 64 who have a cervix</p> <p>Information for women to help them make an informed choice about whether or not to come for cervical screening</p> <p>Aim to achieve at least 80% coverage of eligible women</p> <p>A team approach to ensure continuity of care for the women</p>
Cervical cancer screening activities	<p>Call and recall services</p> <p>Send prior notification list to practice</p> <p>Invite women 6 weeks prior to test due date with appropriate leaflet</p> <p>Reminder letter sent to patient 15 weeks after invitation letter</p> <p>GPs, practice nurse sample taking, provide</p>

information
Laboratories, Sample & biopsy interpretation Colposcopy/gynaecology, further investigation/treatment
PHV vaccination program

5.3 The pre-and post- intervention assessment tool

A pre- and post-intervention assessment questionnaire based on previous literature (Badrinath *et al.*, 2004, Ganry and Boche, 2005, Maar *et al.*, 2013) was developed by the researcher to investigate the impact of the intervention on the participants. The questionnaire involved three sections. The first section (Table 5-2) contained introductory demographic characteristics (such as qualification, job title, and number of years of work as health care professionals). The second section (Table 5-2) consisted of questions on the participant's background and their existing routine regarding smear test and (HPV) DNA test performance. The third section (Table 5-3) contained questions on the participant's knowledge of the risk factors for cervical cancer; smear test techniques; screening interval; responsibility of sample takers; indicator of the transformation zone; the age at which women were eligible for the screening programme and the colposcopy recommendations.

Table 5-2 Demographic characteristics and current smear test performance

First section ----- Demographic characteristics	
Please give us some information about yourself.	
Your professional qualification:-	
How many years have you worked as a health professional since you qualified:-	
Your current job title:-	
Second section ----- Current Smear test performance	
Do you ever recommend <i>Human papillomavirus (HPV) DNA testing for your female patients?</i>	Yes, I recommend HPV DNA testing with the smear test for routine cervical cancer screening
	Yes, I recommend HPV DNA testing as a follow up test for an abnormal smear test
	No, I do not recommend HPV DNA testing at all
For female patients who are premenopausal, >= 30 years old who are HPV positive and recently had a smear test showing ASC-US (atypical squamous cells of undetermined significance), please indicate what you would typically do?	Manage in my own practice <input type="text"/>
	Refer to another practitioner (specify type) <input type="text"/>
During a typical month, for how many asymptomatic, average-risk female patients do you personally order or perform cervical cancer screening with smear testing?	1-10
	11-20
	20-30
	>30
Considering the cultural and religious context of Middle-East countries, who would you refer for cervical screening	Married women
	Non married women
	Women at risk of sexual violence and abuse
	All women Please add any information about cultural sensitivity that you think is relevant

Table 5-3 Third section questionnaire

Risk factors for cervical cancer include
Viral infection –particularly HPV16, 18, 31, 33
Smoking
Immunosuppression
Not attending for cervical screening
Use of hormone replacement therapy
Previous family history of breast cancer.
Not sure
Women eligible for cervical cancer screening are those aged between:
18-60 years
20-64 years
25-60 years
25-64 years
Not sure
The recommended routine screening interval for women aged 25-49 years is:
1 yearly
2 yearly
3 yearly
5 yearly
Not sure
The indicator of the transformation zone is:
Presence of mature metaplastic epithelial cells
Presence of immature metaplastic epithelial cells
Presence of squamous epithelium cells
Absence of squamous epithelial cells
Presence of endocervical and/or immature metaplastic cells.
Not sure
The responsibilities of the sample taker include:
Ensure the whole of the transformation zone has been sampled (cervix visualized and sampled 360 degree x 5 times)
Ensure the whole of the transformation zone has been sampled (cervix visualized and sampled 90 degree x3 times)
Ensure the whole of the transformation zone has been sampled (cervix visualized and sampled 160 degree x5

times)

Not sure

At what age would you recommend women and/or girls have the HPV vaccination?

9–10 years

11–12 years

12–18 years

13–15 years

19–22 years

Not sure

During LBC cervical screening you have to rotate the cervix brush:

2 times

4 times

5 times

3 times

Not sure

Cytobrush /endocervical (CTB) sample should be taken in

90 degree

45 degrees

80 degrees

60 degrees

Not sure

For patients over 30 years who have borderline changes and low-grade dyskaryosis you should:

Recommend a HPV test

Recommend screening again in 3 years

Recommend screening again in 5 years

Reassure the patient that these borderline changes very rarely need treatment

Not sure

Colposcopy is recommended for the patients with:

HPV+

Low grade CIN

High grade CIN

Not sure

Which cytology method is recently used most often for cervical cancer screening?

Liquid-based – specimen suspended in liquid solution

Conventional cytology – smear spread on glass slide and fixed

Other (specify)

Not sure

Indicate your level of agreement with the following statements

A 35-year-old woman with negative smear tests over the past 5 years and no new sexual partners asks whether she should continue having a regular smear test. Do you answer?

Yes, I strongly recommend she continues

Yes, if she is worried about herself

Yes, if she has any vaginal problems

No, she does not need it

No, but I would support her if she wanted to continue to have them

How effective are the following screening procedures in reducing cancer mortality in average-risk women?

Smear test (conventional cytology)	Very effective	Not effective	Not sure
------------------------------------	----------------	---------------	----------

Smear test (Liquid based cytology)

HPV DNA test with smear test

5.4 Recruitment and sample

Invitation letters from the Kirkuk Health Directorate were sent to the two main hospitals in Kirkuk city and a number of the central health care centres, asking staff from each institution to nominate candidates (gynaecologists, general practitioners, and/or nurses) to participate in the educational intervention. A sample of 27 doctors and 19 nurses participated in the intervention: 23 doctors completed the pre-post evaluation questionnaire. Because the nurses had no previous background and information on smear testing and the cervical cancer screening programme, they were not asked to complete the questionnaire and their participation was initially to prepare a cohort of nurses to be involved in the performance of smear test and cervical screening programme. They did not therefore contribute data to the study.

All participants were given a full explanation of the purpose of the study and the intervention; a pre-intervention questionnaire was distributed among the doctor participants before starting the intervention and they were given 30 minutes to complete it. Each participant had been given a number to write on the pre-intervention questionnaire and was asked to write the same on the post-intervention questionnaire. The researcher was blinded to the number allocated to each participant. All responses were completely anonymised and participants were assured of the confidentiality of their responses.

5.5 Data analysis

The data analysis was supported by the use of SPSS version 22 (IBM SPSS®). Standard descriptive analyses with McNemar's test were used. Statistical significance was set at p less than 0.05

5.5.1 Demographic data analysis

As data were only collected from medically qualified participants, from this point I will use the term ‘participants’ to refer to those who attended the course who were medical doctors. The majority of participants (n=14, 60.9%) were specialist gynaecologists, as shown in Table 5-5. Six (26.1%) were general practitioners, two (8.7%) were junior doctors and one (4.3%) was a family medicine specialist. The mean of number of years of service as a health care professional since the participant had qualified was 11.15 years, with a range of 1-30 years.

Table 5-4: Job titles of participants

Job title	Frequency	Percent
Specialist gynaecologist	14	60.9%
G.P practitioner	6	26.1%
Junior doctor	2	8.7%
Family medicine specialist	1	4.3%
Total	23	100.0

5.5.2 Current smear test practice in Kirkuk, Iraq

Participant practices related to routine Smear test performance are summarized in Table 5-6. The largest proportion (n= 10, 43.5%) of doctors recommended HPV DNA testing as a follow up test for an abnormal smear test , while less than a quarter (n=5, 21%) recommended the test with smear test for routine cervical cancer screening and eight (34.8%) did not recommend HPV DNA testing at all. As shown in Table 5-6, when doctors were asked what they would typically do for their female premenopausal patients aged less than 30 years who were HPV positive and recently had a smear test showing atypical squamous cell of undetermined significance (ASC-US), more than half of total of 23 participants doctors answered they would refer the patient to another practitioner in a neighbouring country.

Table 5-5: The rate of current Smear test performance among doctors

Questions	Frequency	Percent
Do you ever recommend <i>Human papillomavirus (HPV)</i> DNA testing, for your female patients?		
Yes, I recommend HPV DNA, with the smear test for routine cervical cancer screening	5	21.7%
Yes, I recommend HPV DNA, smear testing as a follow up test for an abnormal smear test	10	43.5%
No, I do not recommend HPV DNA, smear testing at all	8	34.8%
Total	23	100.0
For the female patients Premenopausal, ≥ 30 years old who are HPV positive and recently had a smear test showing ASC-US; please indicate what you would typically do?		
Manage in my own practice	6	26.1%
Refer to another practitioner	17	73.95%

(specify type) Neighbour country		
Total	23	100

Table 5-6: The rate of routine smear test performance among participants

During a typical month, for how many asymptomatic, average-risk female patients do you personally order for or perform cervical cancer screening with smear testing?		
1-10	15	65.2%
11-20	6	26.1%
20-30	1	4.3%
>30	1	4.3%
Total	23	100
Considering the Middle- East countries cultural context, in your opinion who would be eligible for cervical cancer screening?		
Married women	18	78.3
Non married women	0	0.0
Women at risk of sexual violence and abuse	1	4.3
All women	4	17.4
Total	23	100.0

When participants were asked for how many asymptomatic patients with an average risk of cervical cancer did they personally refer for, or perform, smear testing during a typical month, the majority had reported from 1-10 patients, with only one reporting that they ordered or performed smear testing for more than 30 patients (Table 5-7).

Considering the Middle-Eastern religious and cultural context, I asked participants to indicate which groups of women were eligible for cervical cancer screening. The largest proportion 18.78% believed only married women should be eligible, while only

17.4% expressed the belief that all women should be eligible for cervical screening and just one doctor (4.3%) cited the need to identify and refer sexually abused women (Table 5-7).

5.5.3 Comparison of knowledge pre-and post- intervention

Before making comparisons, to make sure the data were normally distributed and to confirm that a paired t-test could be carried out, the normality of the differences was tested using a Shapiro-Wilk test (Table 5-8) and the differences were found to be normally distributed $P=0.153$ (for Shapiro-Wilk test P-value should be above 0.05) (Shapiro and Wilk, 1965).

Table 5-7 Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
differenc e	0.155	23	0.162	0.937	23	0.153

a. Lilliefors Significance Correction

To obtain the difference between participants' knowledge and perceptions, pre- and post-intervention responses were scored as follows: (1) was allocated for the correct answer and (0) for any incorrect answer. One sample t-tests were carried out to find the differences between scores before and after the intervention (Kinnear and Gray, 2002). Results of a paired t-test found that there were significant differences between the total scores before the training course and the total scores after training ($t=-19.742$, $df =22$, $p=0.001$) (Table 5-9)

Table 5-8: Paired samples test

	Paired Differences		95% Confidence Interval		t	df	Sig
	Mean	Std.Dev	of the Difference				
			Lower	Upper			
total_before-	-11.56522	2.80	-12.78014	-	19.7	22	0.001
total_after		950		10.35030	42		

5.5.4 Knowledge of the risk factors for cervical cancer screening

McNemar’s test was used to compare the difference in knowledge of the risk factors for cervical cancer screening among doctors, pre- and post-intervention. The quantitative findings relating to the level of the knowledge on risk factors for cervical cancer are illustrated in Table 5-10. The results revealed that largest proportion of participants (82.6%) reported viral infection (particularly HPV16, 18, 31, 33) as a risk factor before the intervention, compared with 100% following the intervention. The exact McNemar’s test determines that this difference in the proportion is statistically not significant ($p = 0.125$). The findings show significant changes in the level of knowledge on smoking as a risk factor for cervical cancer among the participants: six (26%) had reported smoking as a risk factor for cervical cancer before the intervention, while this number had increased to 23 doctors (100%) following the intervention ($p=0.001$). In addition, around a third of the participants were not aware of immunosuppression as a risk factor before the intervention, but 87% reported immunosuppression as a risk factor after the intervention ($p =0.004$). About 34.8 % of participants had selected ‘not attending for cervical cancer screening’ as a risk factor for cervical cancer, while 87.0 % of them reported the same factor was a risk after the intervention and this was statistically significant ($p=0.002$). The majority of the participants 78.3% reported the

use of hormone replacement therapy as a risk factor for cervical cancer before the intervention, compared with only 17.4 % after the intervention: a p-value of *0.001* indicates this was statistically significant. Also, 19 participants out of the 23 had reported previous family history of breast cancer as a risk factor before the intervention, compared to only two after the intervention ($p=0.001$).

Tables 5-9 McNemar's Test result and descriptive statistics for knowledge of risk factors

Questions	Before		After	
	Frequency	Percent	Frequency	Percent
Risk factors for cervical cancer include				
Viral infection –particularly HPV16, 18, 31, 33	19	82.6%	23	100.0
Not selected	4	17.4%	0.0	0.0
Total	23	100.0	23	100.0
<i>Test Statistics^a Exact Sig</i>	<i>PV=.125^b</i>	<i>^b Binomial distribution used.</i>		
^a McNemar Test				
Smoking	6	26.1%	23	100.0
Not selected	17	73.9%	0.0	0.0
Total	23	100.0	23	100.0
<i>Test Statistics^a Exact Sig</i>	<i>PV= 0.001^b</i>	<i>^b Binomial distribution used.</i>		
^a McNemar Test				
Immunosuppression	8	34.8%	20	87.0%
not selected	15	65.2%	3	13.0%
Total	23	100.0	23	100.0
<i>Exact Sig Test Statistics^a</i>	<i>PV=0.004^b</i>	<i>^b Binomial distribution used.</i>		
^a McNemar Test				
Not attending for cervical cancer screening	8	34.8 %	20	87.0%
Not selected	15	65.2 %	3	13.0 %
Total	23	100.0	23	100.0
<i>Test Statistics^a Exact Sig</i>	<i>PV= 0.002^b</i>	<i>^b Binomial distribution used.</i>		
^a McNemar Test				
Use of hormone replacement therapy	18	78.3%	4	17.4 %
Not selected	5	21.7%	19	82.6 %
Total	23	100.0	23	100.0
<i>Test Statistics^a Exact Sig</i>	<i>PV=⁰.001^b</i>	<i>^b Binomial distribution used.</i>		
^a McNemar Test				
Previous family history of breast cancer	19	82.6%	2	8.7%
Not selected	4	17.4%	21	91.3%
Total	23	100.0	23	100.0
<i>Test Statistics^a Exact Sig</i>	<i>PV=0.001^b</i>	<i>^b Binomial distribution used.</i>		
^a McNemar Test				
Not sure	5	21.7%	1	4.3 %
Not selected	18	78.3%	22	95.7%
Total	23	100.0	23	100.0
<i>Test Statistics^a Exact Sig</i>	<i>PV=0.001^b</i>	<i>^b Binomial distribution used.</i>		
^a McNemar Test				

5.5.5 Knowledge on the indicator of transformation zone for cervical cancer screening

Before the intervention three participants correctly stated that the presence of mature metaplastic squamous epithelial cells was an indicator of the transformation zone, compared to 19 who selected the correct answer after the intervention (Table 5-11). The exact McNemar's test results indicates this was statistically significant ($p=0.001$).

Table 5-10 McNemar Test and descriptive statistics for knowledge of the transformation zone

Questions	Before		After	
	Frequency	Percent	Frequency	Percent
The indicator of transformation zone				
not selected	20	87.0	4	17.4
Presence of mature metaplastic squamous epithelial cells	3	13.0	19	82.6
Total	23	100.0	23	100.0
Exact Sig	$PV=0.001$ ^b ^b Binomial distribution used			

5.5.6 Doctors' opinions on the age at which women should be eligible for cervical cancer screening

Table 5-12 shows the results regarding doctors' knowledge of the age at which women are eligible for cervical cancer screening, The number who reported the correct age rose from 39.1% (pre-intervention) to 82.6% after the intervention ($p=0.001$).

Table 5-11 McNemar's Test and descriptive statistics for the age at which women were eligible for cervical screening

Questions	Before		After	
	Frequency	Percent	Frequency	Percent
Eligible women for cervical cancer screening are those aged between				
Not selected	14	60.9	4	17.4%
25-64 year	9	39.1	19	82.6%
Total	23	100.0	23	100.0
Exact Sig	<i>PV=0.001^b</i>		<i>^b Binomial distribution used</i>	

5.5.7 Doctors' knowledge of the recommended routine screening interval for women aged 25-49 years

Before the training, only nine doctors correctly reported that the recommended screening interval for women aged between 25-49 years was every three year. However, this rose to 20 correct responses after the education programme ($p= 0.003$) (Table 5-13).

Table 5-12 McNemar's Test and descriptive statistics for the recommended routine interval for screening women aged 25-49 years

Questions	Before		After	
	Frequency	Percent	Frequency	Percent
The recommended routine screening interval for women aged 25-49 years				
not selected	14	60.9	3	13.0
3 years	9	39.1	20	87.0
Total	23	100.0	23	100.0
Exact Sig	<i>PV= 0 .003^b</i>		<i>^b Binomial distribution used.</i>	

5.5.8 Doctors' knowledge of the age at which women should be eligible for HPV vaccination

The majority of the doctors (n=16, 69.6%) were not aware before the intervention that the eligible age for HPV vaccination is from 12 -18 years, compared to 18 (78.3%) who selected the correct age after the intervention (p=0.003) (Table 5-14).

Table 5-13 McNemar's Test and descriptive statistics for doctors' knowledge on the eligible age for HPV vaccination

Questions	Before		After	
	Frequency	Percent	Frequency	Percent
At what age would you recommend women and/or girls have the HPV vaccination?				
not selected	16	69.6 %	5	21.7 %
12-18 years	7	30.4 %	18	78.3 %
Total	23	100.0	23	100.0
Exact Sig	<i>PV=0.003</i>^b ^b Binomial distribution used.			

5.6 Knowledge on the responsibilities of the sample taker during cervical cancer screening

The results presented in Table 5-15 indicate that after the intervention 19 doctors out of 23 correctly responded that the sample taker should make sure that the whole of the transformation zone was sampled, and the cervix visualized and sampled 360 degree 5 times, compared to just six doctors before the education programme. This difference was highly significant (p=0.001).

Table 5-14 McNemar's Test and descriptive statistics for the responsibilities of the sample taker for cervical screening

Questions	Before		After	
	Frequency	Percent	Frequency	Percent
The responsibilities of the sample takers include				
not selected	17	73.9	4	17.4
Cervix visualized and sampled 360 degree *5 times	6	26.1	19	82.6
Total	23	100.0	23	100.0
Exact Sig	<i>PV=0.001</i>^b ^b Binomial distribution used.			

5.6.1 Knowledge of the responsibilities of the sample taker during LBC for cervical cancer screening

As shown in Table 5-16, prior to the education programme, the majority of the doctors (82.6%) were not aware that during LBC they should rotate the cervix brush five times. Following the programme, 95.7% reported the number correctly and this was statistically highly significant ($p=0.001$).

Table 5-15 McNemar's Test and descriptive statistics for the responses concerning the responsibility of the sample takers during LBC

Questions	Before		After	
	Frequency	Percent	Frequency	Percent
During LBC cervical screening you have to rotate the cervix brush				
not selected	19	82.6	1	4.3
5 times	4	17.4	22	95.7
Total	23	100.0	23	100.0
Exact Sig	<i>PV=0.001</i>^b ^b Binomial distribution used.			

5.6.2 Knowledge on the degree of the cyto /endocervical brush

Before the intervention 78.3% of the doctors did not know that cytobrush and endocervical samples should be taken at 90 degree angle, whilst 95.7% knew this after intervention ($p=0.001$) (Table 5-17).

Table 5-16 McNemar's Test and descriptive statistics for knowledge of sampling via cyto/endocervical brush

Questions	Before		After	
	Frequency	Percent	Frequency	Percent
Cytobrush/endocervical (CTB) sample should be taken in				
not selected	18	78.3	1	4.3
90 degree	5	21.7	22	95.7
Total	23	100.0	23	100.0
Exact Sig	$PV=0.001^b$ ^b Binomial distribution used.			

5.6.3 Knowledge of current method of cytology most often used internationally

As shown in Table 5-18, the majority of the participants (78.3%) were not aware that liquid based cytology was used for the collection and preparation of cervical samples. However, the situation was reversed after the education programme, as 91.3% correctly reported LBC as the method in use ($p=0.001$).

Table 5-17 McNemar's Test and descriptive statistics for responses regarding the method of cytology currently used

Questions	Before		After	
	Frequency	Percent	Frequency	Percent
Which cytology method is recently used most often for CCS				
not selected	18	78.3	2	8.7
Liquid based	5	21.7	21	91.3
Total	23	100.0	23	100.0
Exact Sig	$PV= 0.001^b$ ^b Binomial distribution used.			

5.6.4 Doctors' opinions on how effective tests are in reducing cancer mortality in average risk women

Conventional cytology was reported to be an effective screening procedure in reducing cancer mortality in women with 'average risk' by 69.6% (n=16) of participants before the intervention, but 22 (95.7%) recognised it was not very effective after the intervention (p=0.001). Furthermore, only 56.5% (n=13) participants reported HPV DNA as an effective test before the intervention, compared to 91.3% after the intervention (p=0.002). Liquid based cytology was recognised as a very effective smear test by only 17.4% doctors before the intervention, compared to 91.3% after the intervention (p=0.001) (Table 5-19).

Table 5-18 McNemar's Test and descriptive statistics for knowledge of effectiveness of the Smear test procedures

How effective is conventional cytology screening procedures in reducing cancer mortality in average risk women?				
	Before		After	
	Frequency	Percent	Frequency	Percent
Very effective	16	69.6	1	4.3
Not selected	7	30.4	22	95.7
Total	23	100.0	23	100.0
Exact Sig	<i>PV= 0 .001^b</i>		<i>^b Binomial distribution used.</i>	
How effective is HPV DNA test with smear test in reducing cancer mortality in average-risk women?				
	Before		After	
	Frequency	Percent	Frequency	Percent
Not selected	10	43.5	2	8.7
Very effective	13	56.5	21	91.3
Total	23	100.0	23	100.0
Exact Sig	<i>PV= 0 .002^b</i>		<i>^b Binomial distribution used</i>	
How effective LBC is in reducing cancer mortality in average-risk women?				
	Before		After	
	Frequency	Percent	Frequency	Percent
Not selected	19	82.6	2	8.7
Very effective	4	17.4	21	91.3

Total	23	100.0	23	100.0
Exact Sig	<i>PV= 0 .001^b</i>		<i>^b Binomial distribution used</i>	

5.7 Participants' responses regarding management of patients over 30 years who have borderline changes and low grade dyskaryosis

When asked about management of a patient over 30 years who had borderline changes and low grade dyskaryosis, before the intervention only eight doctors (34.8 %) reported that they would recommend HPV screening, compared to 20 doctors (87%) after the intervention ($p=0.004$) (see Table 5-20)

Table 5-19 McNemar's Test and descriptive statistics regarding management of a patient over 30 years who had borderline changes and low grade dyskaryosis

Questions	Before		After	
	Frequency	Percent	Frequency	Percent
For patient over 30 years who have borderline changes and low-grade dyskaryosis you should				
not selected	15	65.2	3	13.0
Recommend HPV test	8	34.8	20	87.0
Total	23	100.0	23	100.0
Exact Sig	<i>PV= 0 .004^b</i>		<i>^b Binomial distribution used.</i>	

5.7.1 Doctors' opinions on recommendation of colposcopy

As indicated in In Table 5-21 , before the intervention only third of the doctors reported that they would recommend colposcopy for a patient with HPV+, compared to 82.6% (n=19) after the intervention ($p=0.003$).

Table 5-20 McNemar's Test and descriptive statistics for colposcopy recommendation

Questions	Before		After	
	Frequency	Percent	Frequency	Percent
Colposcopy is recommended for the patient with				
High grade CIN	15	65.2	4	17.4
HPV+	8	34.8	19	82.6
Total	23	100.0	23	100.0
Exact Sig	$PV=.0003^b$ ^b Binomial distribution used.			

5.7.2 Doctors' responses regarding reply 'When a 35-year-old woman with negative smear tests over the past five years and no new sexual partners asks whether she should continue having a regular Smear test '

In Table 5-22, the results are shown for the responses made by doctors when asked if a 35-year-old woman with negative Smear test s over the past five years and no new sexual partners should continue having a regular smear test. Before the intervention, 10 doctors (43.5%) reported they would strongly recommend that the woman continued to have smear tests, compared to 21 doctors (91.3%) after the intervention ($p=0.001$).

Table 5-21 McNemar's Test and descriptive statistics regarding intention to offer regular smear test to 35 year old woman with negative Smear test

Questions	Before		After	
	Frequency	Percent	Frequency	Percent
A 35-year-old woman with negative smear tests over the past 5 years and no new sexual partners asks whether she should continue having a regular smear test. Do you answer?				
not selected	13	58.5	2	8.7
Yes, I strongly recommend she continues	10	43.5	21	91.3
Total	23	100.0	23	100.0
Exact Sig	$PV= 0.001^b$ ^b Binomial distribution used.			

5.8 Discussion

To the best of my knowledge, cervical cancer screening in Iraq has not been given great attention by researchers in the past. In this study, which is an extension of the work reported in earlier phases of this doctoral study, an educational intervention was carried out building on the researcher updated training at BCU and the Birmingham Women's Hospital (2017). The main aim of the intervention was to address three important issues, first, to increase knowledge and practice of cervical cancer screening among health care professionals; second, to assess the current cervical cancer screening performance among health care professionals and third, investigate the influence of an education programme on the participants' knowledge and practices.

The statistical analyses of the data collected provide evidence that the current cervical cancer screening performance in Kirkuk is insufficient, as the findings show that nearly half of the doctors only recommended HPV screening after an abnormal smear test, with more than quarter (34.8%) not recommending the test at all. This practice is clearly inconsistent with the recommendations of Mayrand *et al.* (2007) who performed experimental investigations on *Human papillomavirus* DNA versus Papanicolaou screening tests for cervical cancer screening. Their analyses revealed that HPV testing has greater sensitivity for detection of cervical cancer, compared with smear testing. In the UK, according to the recommendation by the UK National Screening Committee, cervical cancer screening samples will be tested for HPV first to allow women to benefit from more accurate tests (Department of Health, 2016). Testing for HPV is used as secondary measures for samples needing further investigations. If HPV is found positive this will be a useful guide to whether abnormal cells exist and women can then be monitored more closely with any progressing abnormal cells found earlier. The test also minimizes over-treatment and anxiety if no HPV is present (Department of Health,

2016). A study by the Royal College of Obstetricians and Gynaecologists, 2016 stated that numerous researchers have indicated the potential benefits of incorporating HPV testing for high risk genotypes into cervical screening. Studies have indicated that the negative predictive value of high risk (hr) HPV testing is very high, at over 96% (Arbyn *et al.*, 2013), whereas the added risk of positive hrHPV indicates colposcopic referral without prolonged periods of repeated cytology (Arbyn *et al.*, 2013). In four European randomised controlled trials of HPV screening, all of which compared cytology with cytology combined with hrHPV testing, authors reported a significantly greater detection of CIN2+ in the first screening round, with a significantly reduced incidence of CIN2+ in subsequent screening rounds three years later (Royal College of Obstetricians and Gynaecologists, 2016). The analysis of these large trials with adequate follow-up demonstrated a reduction in the incidence of cervical cancer in those women who had had HPV screening in addition to the cytology test (Royal College of Obstetricians and Gynaecologists, 2016). The findings of the present study also provide evidence of a lack of knowledge related to the management for a patient who is HPV positive and has a smear test showing atypical squamous cell of undetermined significance, as the majority (73.9%) of the doctors stated they would refer the patient to a practitioner in a neighbouring country for specialist support. A recent study by Sankaranarayanan *et al.* (2014) has confirmed that cancer health services in most low-middle income Asian countries are not adequately developed. There are few facilities for cancer prevention, diagnosis and treatment, very limited access to essential cancer chemotherapeutic drugs, radiotherapies and surgery, with very limited awareness among the healthcare professional in terms of cervical cancer signs and symptoms, diagnosis and managements (Sankaranarayanan *et al.*, 2014). According to a report from the World Health Organisation (2012), Iraq has a population of 10.74 million women aged 15 years and above, who are at risk of developing cervical cancer. Establishment of

evidence based cervical cancer screening programmes as well as prevention strategies, management guidelines and continuing care for women with cervical cancer is therefore of crucial importance. Health policy makers need to improve facilities for cervical cancer prevention and management: in addition, long-term planning with well-developed educational foundations is required.

Findings highlighted that 60.9% of all participants did not know the appropriate age for cervical screening; however, 82.6% of them reported this correctly after the study intervention. A review study conducted by the UK Advisory Committee in 2009 on cervical screening indicated that screening in very young women was ineffective, with no evidence that cervical cancer had increased in women under the age of 25 years. The review stated that the national HPV vaccination programme is likely to reduce the risk of cervical cancer in women below 25 years. Furthermore, screening women less than 25 years would possibly be harmful rather than useful (Royal college of Obstetricians and Gynaecologists, 2016).

The results also show that more than half of the participants (65.2%) order /perform 1-10 smear tests per month for an average risk patients. However, evidence from a previous study suggests that there are an estimated 50 cases of abnormal cervical smears with low-high grade precursor lesions for every case of invasive cancer that requires attentive monitoring (Franco, 1997). Despite prior evidence, an Iraqi study on colposcopy, cervical cytology and *Human papillomavirus* detection as screening tools for cervical cancer, which involved 77 women referred for investigation of smear test abnormality, confirmed that 24% of patients were recorded with atypical squamous cells of undetermined significance (ASUS); 45% with low grade squamous intraepithelial lesion (LSIL) and 79% with high grade (HSIL) (Al Alwan (2001). Furthermore, an experimental investigation was conducted to explore the rate of abnormal cervical

smears among women visiting a gynaecology clinic in Baghdad, Iraq and the authors found an unpredicted high incidence of squamous intraepithelial lesion (77%) (Abdulla *et al.*, 2016).

The findings of this study provide evidence that the intervention increased overall knowledge on cervical cancer screening among participants, as there was a significant difference between the total knowledge scores before and after the education programme ($p=001$). Before the intervention, the majority of doctors had had a low level of knowledge on the risk factors for cervical cancer. This finding is in agreement with studies conducted in Jordan (Obeidat *et al.*, 2012) and in the United Arab Emirates (Badrinath *et al.*, 2004). Their analyses revealed that lack of awareness on cervical cancer among health care professionals is a fundamental problem with respect to use of cervical cancer screening in Arab countries. This was also confirmed by Del Refugio Gonzalez - Losa *et al.* (2009), who indicated there is limited awareness of cervical cancer and its prevention through the use of smear tests among health care professionals in developing countries. Crucially, the researcher's educational intervention improved participants' knowledge on risk factors for cervical cancer.

Accordingly, the findings show low knowledge levels among participants on the effectiveness of the LBC (17.4%), HPV DNA (56.5%) test before the intervention, this rate had increased to 91.3% after the intervention. There have been several studies in the literature reporting liquid-based cytology to increase the sensitivity of cervical cytology and the proportion of slides that are satisfactory for assessment, in comparison with conventional cytology (Ronco *et al.*, 2007). A report by Miller *et al.* (2000) presents exhaustive records on a consensus conference on cervical cancer screening and managements and suggests a direction for future developments, indicating that liquid based cytology is a promising approach that had been made to improve the efficacy of

cervical cytology. Additionally this report points out to the consideration of a triage protocol involving a combination of the liquid-based and HPV DNA test in developed countries. A further instance of this is the huge changes to the screening programme in recent years in the UK. In 2003 the decision was made to convert to liquid based cytology and the conversion is now complete (Anttila and Ronco, 2009). During recent years statistics from the screening programme indicate that the rate of inadequate smears had fallen to 2.9%, compared to over 9% unsatisfactory smears 10 years earlier. Another benefit of LBC conversion is that the test results are available to women sooner than using other methods (Anttila and Ronco, 2009).

The results of the present study also suggest that more doctors become aware of the eligible age for HPV vaccination as a result of the intervention. In 2008 the Department of Health in the UK declared the introduction of an HPV immunisation programme to routinely vaccinate girls 12-13 years with a catch-up for up to 18 years (Leinonen *et al.*, 2009). Initially the bivalent HPV 16/18 vaccine was used across the UK with the uptake rates of nearly 90% of girls eligible for the vaccine in 2010/2011 (Munro *et al.*, 2017). In September 2012, the vaccine used in national programme changed to the quadrivalent vaccine (HPV 6/11/16/18) to give additional protection against genital warts (Munro *et al.*, 2017). In Australia there are currently two vaccines used against HPV; Gardasil (HPV type 6, 11, 16, 18) which is registered for use in females aged 9-45 years and in males aged 9-24 years (Mazza *et al.*, 2014) and Cervarix, used in females aged 10 to 45 years, but not in males. Both vaccines have proven high efficacy against HPV types 16 and 18 (Mazza *et al.*, 2014). However, information on efficacy of HPV vaccine in the age group 24-45 years is limited. One study indicated that Gardasil is highly effective in preventing HPV-related disease in females aged 15-45 years (Mazza *et al.*, 2014) Doctors, like other professionals, have commitments to update their knowledge and

skills through continuing professional educational (Burnham *et al.*, 2009). However, this is challenging in Iraq as the country is facing serious deterioration in health services due to lack of resources after decades of sequential wars, administrative corruption, and poor governance (Mosawi, 2008). The health status of Iraq's population following decades of war and sanctions resulted in a critical drop in Iraq's local productivity and consequently affected public expenditure on health services (World Health Organization , 2017b). The existing system has difficulties in providing comprehensive information for evidenced-based management. Furthermore, the current ongoing conflict and poor security situation has caused more damage to the countries health infrastructure: many health care professionals have fled to abroad or neighbouring countries with the result that the population's access to the basic health services has become progressively impaired (World Health Organization , 2017b)

The nurses who attended the educational intervention were not included in the data collection. While all the participant nurses had a Bachelor of Nursing Science degree, they had not attended any training programme related to the Smear test or screening programme previously and had no experience in the Unit of Early Detection of Cervical Cancer. Informally, they expressed their strong willingness to be involved in the programme and to have the opportunities to participate in more training courses related to the smear test and sample taking procedure, although the role of nurses undertaking smears in Iraq is not established. It is becoming increasingly important to develop a health care system that considers the role of nurses and midwives in promoting the use of cervical cancer screening programme in Iraq. Unfortunately, there has been huge damage to nursing development in Iraq over that last two decades through three international wars and 13 years of economic sanctions (Garfield and McCarthy, 2005). The World Health Organisation has supported the development of training centres and

short courses for nursing leaders and much more remains to be done to restore nursing in Iraq (World Health Organization, 2006). There is an opportunity for nurses to improve care of women, in particular in relation to cervical screening, at all levels in the healthcare system in Iraq and there is global support for such initiatives (Oliver, 2009). The world health organization has identified the important contributions of nurses and midwives to global health 'as a means of achieving better health for all communities' (World Health Organization, 2006). In the 21st century, nurses who are aware of the opportunity for control of cervical cancer anticipate an expansion in the scope of their role through improvements in training and by acting as advocates for cervical cancer screening (ZechariahJebakumar *et al.*, 2014). Nurses are vital in providing health care and supporting comprehensive access to health care services and they possibly could inspire Sustainable Development Goals as leaders, researches, educators and care providers (Wilson *et al.*, 2016). In November 2016, the Global Advisory Panel on the Future of Nursing (GAP-FON) was announced to promote global nursing collaboration and improve global health (Wilson *et al.*, 2016). The participation of all nurses in global health will reinforce a platform for global nursing practice (Wilson *et al.*, 2016). Globalization expansion has raised awareness of the importance of the global health among health policy makers, students and faculty in the health professions (Wilson *et al.*, 2016) and this could be used to support developments in nursing in Iraq. For example, when nurses and midwives are trained to have sufficient understanding of cervical cancer screening techniques during graduate and post graduate education, they have been shown to have a successful role in screening programmes (Turkistanlı *et al.*, 2003) and the use of nurses to support cervical screening programmes is well-documented in other countries. There have been several studies in the literature reporting the role of the nurses in improving the cervical screening programmes, for instance in the United Kingdom 70-80% of cervical cancer smears are taken by nurses,

with 90% of nurses receiving specialized training in cervical cytology. In fact nurses perform three quarters of smear tests in health care centres settings (Holmes *et al.*, 2014). A further instance of the role of nurses in cervical cancer screening programme is the introduction of the Practice Nurse Incentive Programme in Australia in 2012 that advocates a more active role for nurses to be involved in the screening programme (Holmes *et al.*, 2014). Evidence from considerable international studies recommends that nurses proceed to improve services in poor areas with low doctors to population ratios as reviewed by Guvenc *et al.* (2013). In Sweden, the responsibility of cervical cancer prevention is shared among gynaecologists, midwives and cytopathologists. Here, as elsewhere, school nurses have a major role in the school based HPV vaccination programmes for girls aged 11-12 years (Oscarsson *et al.*, 2011). It was found that public health nurses, who work in primary health care centres have an important role in raising women's awareness about cervical cancer and prevention through making home visits (Kolutek and Avci, 2014). Aside from this, nurses have the opportunity to educate women about early diagnosis, while screening is a simple method that could protect women from cancer as long as nurses are aware of the women's cultural values, life styles and health- disease perceptions (Kolutek and Avci, 2014). Nursing as a science and body of knowledge, has other dimensions depending on the intellectual, social, cultural and philosophical tendencies of experts in theory (Sadat Hoseini *et al.*, 2013). The role of nurses is not only to be a competent sample taker but also to have a good understanding of why screening is important and what the risks of not being screened are. It is recommended that a cervical cancer sample takers update their training on a three yearly basis (NHS, 2016). Nurses play a crucial role in promoting adherence to cervical screening and they need to address women's perceptions and knowledge about screening through discussing its benefits and importance openly (Urrutia *et al.*, 2017). Cervical cancer is the reason behind the death

of increasing number of women; thus, nurses play an important role in the promotion of its detection and prevention (Urrutia *et al.*, 2017). According to King's theory of nursing, which characterises reflective interactive theories, nursing helps individuals maintain their health so they can function in their role. She has recommended the behavioural theory of sustainable interactive systems in nursing (Sadat Hoseini *et al.*, 2013).

5.8.1 Strengths and limitation of this phase of the study

It is a limitation of my study that I did not survey all the general practitioners who were working in Health Care Centres and were not conducting cervical cancer screening because of unavailability of the screening in general practice in Iraq. Therefore, these findings are unlikely to represent the experience and knowledge of all GPs in the city. The findings presented here indicate it is very possible to facilitate improvements in the knowledge and practice among health care professionals who are willing to undertake this type of education and training programme. Overall, the results do highlight the need for further educational interventions. Most importantly, changes to health policies are required, after years of war and sanctions the health system in Iraq is still in a critical situation, the effect of sanctions have affected all aspects of health care. Staff of Iraqi hospitals has no access to Internet, foreign journals, and the consequences of this is outdated and under-skilled health care professionals (Akunjee and Ali, 2002, Al Hilfi *et al.*, 2013). This means that women who could avoid severe illness and death due to cervical cancer are not provided with the means or opportunity to access screening.

5.9 Conclusion

To conclude, in this chapter I have presented the findings of the phase three of this study and I have explained the study intervention with the method used to evaluate the impact of the study intervention by using a pre- and post-intervention questionnaire. This added value to the study through triangulation via a mixed methods approach to data collection and analysis. The findings of this phase of the study provide evidence that the current cervical cancer screening performance in Kirkuk/Iraq is insufficient and that the study intervention increased overall knowledge on cervical cancer screening among participants.

In the next chapter I will discuss the key findings addressing the objectives of my research project that were described in Chapter One. Additionally, I will discuss the potential implication of the research findings and the direction for future research.

Chapter six

General discussion and recommendations

6.1 Introduction

The following chapter includes a discussion of the key findings and how they have addressed the study objectives. I will present the theoretical considerations relevant to cervical screening practices in Kirkuk, Iraq, and discuss the Health Belief Model in relation to the findings. In addition to the general discussion, I will present a critique of the entire study, implications for practice and recommendations for further research.

6.2 Summary of key findings

The main aim of this study was to gather evidence regarding strategies that could be used to establish population-based cervical cancer screening in Kirkuk, Iraq. I used a mixed method approach in addition to conducting an integrative review on the studies focusing on the interventions that have been implemented in the Western Asia Middle East Arab countries and addressed the factors that have had an impact on cervical screening uptake in those countries.

To achieve the main purpose of this doctoral study, the specific objectives were:-

- To explore current cervical cancer preventive services in Kirkuk
- To investigate practical challenges that health care professionals may face when establishing a population-based cervical cancer screening programme
- To assess knowledge and practice of gynaecologists regarding a cervical cancer screening programme

- To explore women's knowledge of cervical cancer and cervical cancer screening
- To explore the factors those have impact on women's access to cervical cancer prevention services.

The thesis objectives were met through two sequential linked studies; the first consisted of a qualitative study in which grounded theory was used to analyse data collected via face-to-face semi-structured interviews with gynecologists and women attending for an appointment for a smear test. Findings that emerged from this phase of the study informed the development of the study intervention (educational training). A quantitative study was used to evaluate the impact of the educational training. In this chapter I will discuss each objective in relation to the major findings and the extent to which objective was achieved.

6.2.1 Exploration of current cervical cancer preventive services in Kirkuk, Iraq

Health services in Kirkuk are delivered through three hospitals: two main hospitals located in the city centre and one outside. At the time of this study, cervical cancer screening activities in Kirkuk were carried out through a small unit established by the Ministry of Health, for the purpose of early detection of cervical cancer in one main hospital. The doctors reported that smear testing was commonly performed as a diagnosis test for unhealthy women who were referred by other gynaecologists if they suspected any abnormality in the cervix and the largest proportion recommended HPV DNA testing as a follow up test for abnormal smear test. This is in sharp contrast with the aim of screening as a vital public health tool that saves lives and improves the quality of life through early diagnosis of serious conditions, enabling early treatment and care (Department of Health, 2015).

Additionally, the GP practitioner and the gynaecologists reported that smear test was not available in the medical health centres in Kirkuk; these findings are not consistent with the use of smear and HPV DNA testing in a screening context. However, after implementing the study intervention (education programme), doctors reported that HPV DNA test should be incorporated into the cervical screening programme.

So far, the evidence from the integrative review performed in Phase two and from the empirical data I collected in Phases three and four showed that the national health care delivery system in most WAMEM countries focuses on treating symptoms rather than preventative health care. For instance, in terms of cervical screening in most cases doctors referred to smear test as a diagnostic test rather than used as a tool for secondary prevention practices for early detection of cervical cancer. The above finding contradict a large volume of published studies describing the smear test as a screening test used world-wide in gynaecology to detect premalignant processes in the progression of endocervical cancer, enabling effective reduction of the incidence of the cervical cancer. Due to the significance of these findings on improving access to healthcare in terms of cervical screening, many strategies were suggested to be employed in the health system in Iraq. Further details on the strategies are presented in section 6.7.1.

Overall, evidence throughout the findings from Phases three and four showed that the majority of the doctors agreed on the need to establish a National Screening Programme in Iraq and a local screening programme in Kirkuk and they believed it should start from the health care centres. Doctors suggested introducing screening during antenatal care and emphasised the family medicine role.

Although there is overwhelming evidence that cervical cancer currently is almost totally preventable to a large extent through screening (Zhao *et al.*, 2016), the findings from the qualitative phase (Phase three) of this doctoral study revealed that unfortunately, this

service is not available to the general population in Kirkuk. Clearly, the current cervical cancer prevention services are not effective as they do not target all women aged between 25-65 years (Zhao *et al.*, 2016). The national health care delivery system in Iraq and most other Arab countries focuses on treating symptoms rather than prevention health care (Donnelly *et al.*, 2013): this impacts health practice of women living in this region. Because the majority of chronic diseases such as cancer are asymptomatic in early stages, individuals do not seek health care unless the disease disables their daily activities (Salman, 2012). Although opportunistic cervical screening may be more familiar to the participants, it may therefore potentially exclude some women from receiving the test, as only those women who have gynaecological issues will have the opportunity for cervical screening. Organised population-based cervical screening helps ensure equal access to cervical services and a greater possibility of reaching women at high risk of cervical cancer (Denny, 2012b). Consequently, most patients with carcinoma of the cervix will be detected earlier rather than presenting at the late stage (Denny, 2012b, Lees *et al.*, 2016).

My findings revealed that a common view of the doctors who participated was that the risk factors for cervical cancer, specifically the HPV virus, had increased with the recent crises in Iraq in general and in Kirkuk. Doctors expressed a desire to establish a centre for cervical cancer screening, but few suggested starting a vaccination programme against the HPV virus. Ministry of Health and Iraqi health policy makers need to consider long-term planning to facilitate cervical cancer prevention with efforts focused on the establishment of a population-based cervical cancer screening programme.

6.2.2 Practical challenges facing health care professionals in order to establish a population-based cervical cancer screening programme

In the preliminary study I identified that the most obvious practical challenge in the early detection of cervical cancer was the shortage of trained staff. This phase informed the development of the qualitative phase, which enabled me to obtain more detail about the experiences of gynaecologists in terms of cervical cancer and cervical cancer screening. The key factor highlighted from the qualitative study (Phase two) findings was associated with the insufficiency of the current cervical cancer screening programme in Kirkuk. The most significant factor in this situation was a shortage of trained staff (doctors and nurses), confirming the findings of Phase one. Many doctors pointed to the lack of organized healthcare services, lack of knowledgeable leaders and lack of doctors experienced in cervical cancer (CC) as barriers to cervical cancer screening (CCS) uptake. The likely explanation for this is clearly the previous and current country crisis as the armed conflicts in Iraq caused major damage to health services in many ways (Garfield *et al.*, 2003). One of the most important consequences is that the majority of skilled doctors and other health care workers fled the conflict because doctors and their families were the direct targets of violence. Other health professionals left Iraq to seek a more stable environment (Burnham *et al.*, 2012). The routine support and maintenance of health facilities may collapse in conflict situations, with shortage of medical equipment and drugs (Burnham *et al.*, 2012). When the 2003 United States invasion occurred, the Iraqi health system was already weakened from 23 years of dictatorship, the 1980-1988 Iran-Iraq war, the 1990-1991 Gulf war and 12 years of sanctions and embargoes (Al Hilfi *et al.*, 2013, Burnham *et al.*, 2012). The well-developed hospital-oriented health system existing before Saddam Hussein came to power had badly deteriorated by 1997, with substantial decrease in services it could

provide (Burnham *et al.*, 2012) and since then, the health services have been perceived as continuing to deteriorate (Al Hilfi *et al.*, 2013). A study by Burnham *et al.* (2012) reported a serious deterioration in the quality of services in the Iraqi health system. Of the sustained damage, the depletion of human capital is the hardest to replace, this damage has had an impact on the ability to train future medical practitioners, resulting in less qualified doctors (Al Hilfi *et al.*, 2013, Burnham *et al.*, 2012). Recent efforts have been made by the Iraqi government to stem the loss of doctors from the country; however, the challenges to Iraq are to restore a heavily damaged infrastructure, and rebuild administrative and support system, in addition to the replacement of the human capital (Burnham *et al.*, 2012).

Another practical challenge reported as a barrier by the doctors in the present study was the recent refugee crisis. The current crises and conflict in Iraq have reduced the personal security of citizens and restricted their access to health services (World Health Organization , 2013). Population movement and crowding in temporary shelters increases the risk of communicable disease and causes loss of lives (World Health Organization , 2013). The breakdown of public health programmes, damage to health facilities, disruption of inspection for monitoring disease and providing access to basic health care, in addition to lack of interventions and facilitators to access cancer prevention services, all lead to an increase in the level of risk factors for illnesses in Iraq (World Health Organization , 2013). The internally displaced and refugee population are at particular risk (World Health Organization , 2013). Common life-threatening diseases (e.g. cancer) that could be prevented or treated under more normal conditions are more prevalent and lead to severe suffering (World Health Organization , 2013). The WHO argued that those who are involved in conflict, as well as organizations responsible for assistance, need to collaborate with local authorities to manage the

additional risks faced by this population (World Health Organization , 2013). Therefore, more collaboration is needed to identify women and girls at risk and to help put cervical cancer preventive interventions in place.

6.2.3 Knowledge and practice of gynaecologists on cervical cancer screening programmes

The major finding from Phases 3 and 4 of this study was the lack of knowledge and practice among gynaecologists regarding a cervical cancer screening programme. This finding was not expected. Clearly though, it seems from the qualitative results that gynaecologists' knowledge was influenced by the crises in the country. With the migration of experienced doctors from Iraq, there have been concerns about the quality of health services and the ability of training facilities to replace those who are migrating, especially those with advanced specially training (Burnham *et al.*, 2012)

Obviously, screening for cervical cancer has undergone a significant evolution since the introduction of the smear test in 1941 (Obeidat *et al.*, 2012). One major advance in cervical cancer screening technology was LBC (Denny, 2012b) (see Appendix I). Based on the results of the qualitative study, I developed an educational training intervention on the cervical cancer screening programme in collaboration with the Birmingham City University (BCU) and Birmingham Women's Hospital. To investigate the impact of the intervention on the participants I performed a quantitative study using a pre- and post-intervention assessment questionnaire. One of the more important findings to emerge from this phase was the significant difference between the total knowledge scores before and after the education programme ($p < 0.001$), providing evidence that the intervention increased overall knowledge on cervical cancer screening among participants.

While we are waiting for a national screening programme to be advocated, the implementation of a comprehensive training course to deliver information on current practice in cervical cancer screening and to increase knowledge of cervical cancer screening programmes among healthcare professionals, including nurses, was so crucial. This study enabled me to assess the knowledge and training needs of the doctors and nurses who will be involved in providing smear tests. However, before launching any screening programme in Iraq, public awareness should be raised and gynaecologists should make greater use of opportunistic cervical screening. Regional cervical screening initiatives and strategies should be encouraged and the primary health care system should be supported.

6.2.4 Women's knowledge on cervical cancer and cervical cancer screening

Findings from the preliminary study and the qualitative study showed a very poor knowledge regarding cervical cancer and cervical cancer screening among women living in Kirkuk, Iraq. There were many misconceptions about cervical cancer and cervical screening: many of the women interviewed had a belief that cervical cancer was a punishment from God. The reasons for poor screening uptake were found to be lack of knowledge about the availability of the cervical screening and absence of interventions to facilitate the uptake of cervical screening in this region or country. Women in this study stated that they would be more likely to go for screening if their doctor recommended it. Of note, most of the women reported that most female cancer awareness campaigns in Iraq are mainly focused on breast cancer. The gap in knowledge concerning cervical cancer screening among women in other relevant countries has been documented in several studies (Abdullah *et al.*, 2013, Al Sairafi and Mohamed, 2009, Badrinath *et al.*, 2004, Hwaid and Haseeb, 2013). It is evident from

the literature and the current findings that there is a great need to focus on the health interventions that educate and promote awareness on cervical cancer and cervical screening among women living in this region. These findings also confirm the importance of the interaction between health care professionals and women to raise their awareness on the need for cervical cancer screening. Appropriate level of knowledge, beliefs and attitudes are key elements for adopting a healthy lifestyle, inspiring human behaviours and accepting newly introduced preventive measures (Johnson *et al.*, 2008). Although the findings of the present study are generally consistent with previous studies, the mixed method approach adopted in this study provides an additional source of information that contributes to better understanding to the topic area. For most participants it was very challenging to have regular screening because they have little or no knowledge about cervical cancer and the benefits of cervical screening practices. They did however express the view that, if information on the importance of the cervical screening was communicated to them that would have motivated them to have regular screening. This finding is important for health education programmes in Kirkuk, and more widely in Iraq and needs to be recognised by cervical cancer screening programme educators, as increasing health literacy must be an important component of support services available to women.

6.2.5 Factors that have an impact on women's access to cervical cancer prevention services

One of the objectives of this study was to better understand the personal and external factors influencing cervical cancer screening practices among women living in Kirkuk. Results from Phase one (the integrative review) and Phase two (the qualitative study) demonstrate that the main factor was the absence of an organized systematic programme. In addition, due to inadequate training of medical staff and lack of follow-up most cases

present at advanced stage (Al-Shaikh *et al.*, 2014). However, these poor outcomes might also be due to lack of awareness of susceptibility to cervical cancer with poor information, interaction and communication by the health care providers with women. Doctors' advice to uptake smear test was a crucial factor in motivating women to have cervical screening. Findings indicate the strength of gynaecologists' influence on women's health behaviour through referral or screening recommendations. The results of the integrative review (Phase one) and the qualitative study (Phase two) underscore the importance of having access to healthcare so as to emphasize the uptake of smear test. Specifically, the influence of doctors was the key factor highlighted by the participants and previous researchers (Abdullah and Su, 2010, Al Sairafi and Mohamed, 2009). Furthermore, the findings of this mixed method study reveal that there is no standardised message packaged for educating and promoting cervical screening among women living in Kirkuk.

The other factors affecting the uptake of cervical cancer screening practices included health care professionals' attitude towards screening, pain, embarrassment, stigma and sociocultural beliefs. The findings of the integrative review also found that unmarried women were not seeking reproductive health care (Salman, 2012, Sait, 2011). Given that in most Arab Muslim countries beliefs about the disease are largely affected by the culture (Salman, 2012), this again emphasises the need to education and raise awareness among women about the guidelines of the screening.

It is crucial to note that emotional barriers such as fear and embarrassment can inhibit participation in preventive screening activities; therefore it is important to consider the provision of psychological support for the purpose of motivating women. The potential for embarrassment to have an impact on women's screening decisions was mentioned by one doctor. Considering the cultural and religious factors among women living in Kirkuk and Iraq, targeting this population without exploring the cultural practices may

present a difficult challenge. Certain Middle Eastern cultural restrictions interweave to form a unique tradition and life style that shapes women behaviours, beliefs, health practices and self-care (Guimond and Salman, 2013). These beliefs may affect a women's decision to have a physical vaginal examination. However, none of the women whom I interviewed in Phases one and three of the present study reported embarrassment as a barrier. Women may have refused to uptake cervical cancer screening due to fear of potential social stigma they would suffer if they had a positive test (Sait, 2011). Furthermore, women may also choose not to seek health care or participate in secondary prevention practices (including cervical cancer screening) because they perceive themselves as healthy.

Improving relationships and communication between care providers and patients and enhancing health professionals' cultural competence may help to build trust (Douglas *et al.*, 2014). Strengthening the idea of offering cancer screening through a universal health care system may help to increase cervical screening behaviour to optimal levels among all eligible women living in Kirkuk. Future research should address promotion of culturally sensitive strategies to expand the access of Arab Muslim women to cervical cancer screening.

6.3 Theoretical considerations related to the study

Here I will discuss the theoretical and conceptual frameworks applicable to this study. Theoretical sociocognitive models of health behaviour have been widely used to explain the determinants of behaviour patterns (Glanz *et al.*, 2008). These structures confirm that, in addition to sociodemographic characteristics and knowledge, cognitive characteristics of the individual are important determinants of preventive behaviour (Azaiza and Cohen, 2006). Two conceptual frameworks, the Health Belief Model

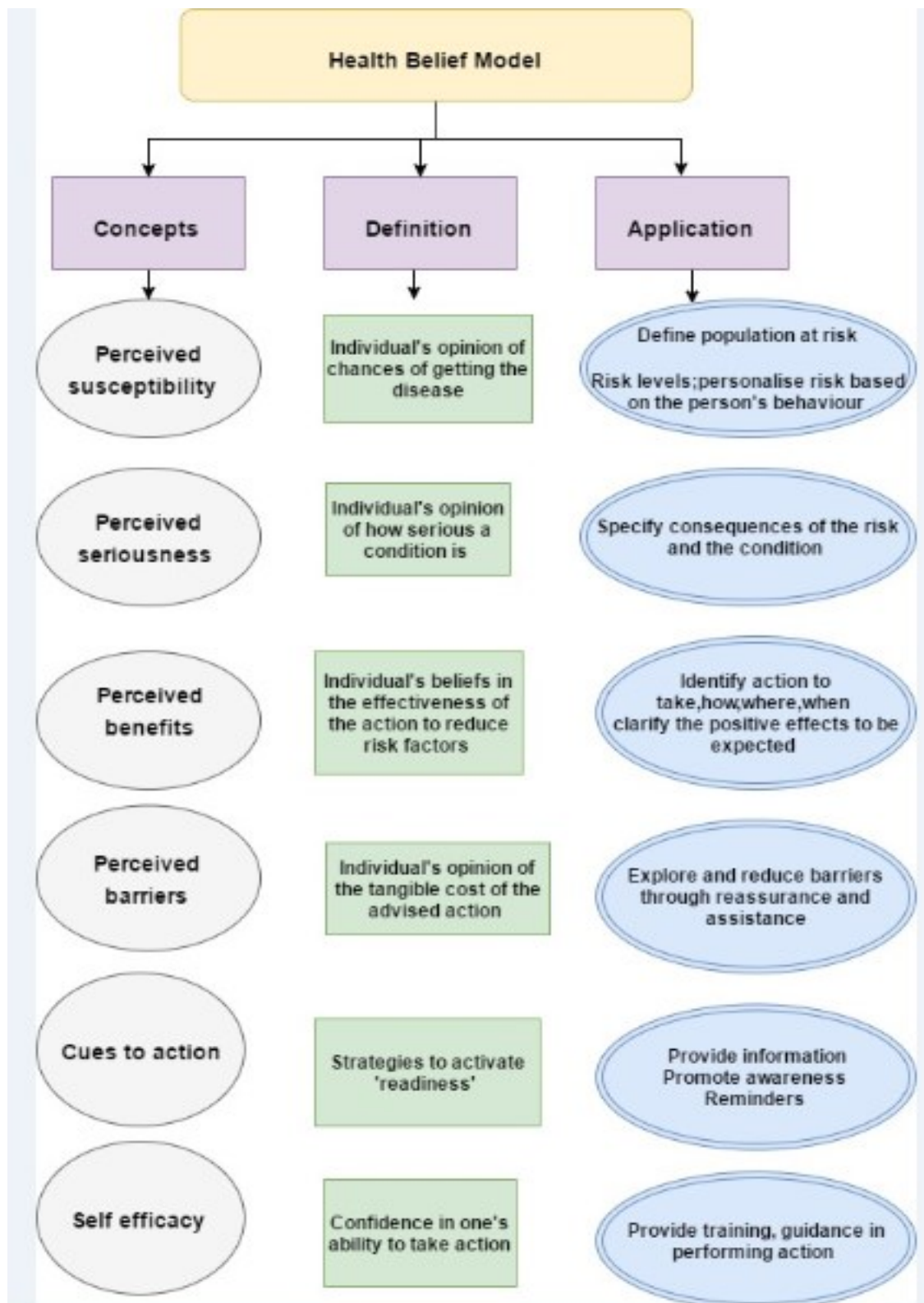
(HBM) and the Theory of Reasoned Action (TRA), have guided studies on screening (Soskolne *et al.*, 2007). The HBM is most commonly used to predict or explain health behaviours (Esperat *et al.*, 2008). I will discuss the HBM as I believe this theoretical model is best suited to the broad purpose of this research. However, there are some limitations of HBM which will be addressed.

6.4 Health Belief Model

The Health Belief Model was developed in the 1950s and is based on four main theoretical constructs: ‘perceived susceptibility’ ‘perceived seriousness’ ‘perceived benefits’ and ‘perceived barriers’ (Rosenstock *et al.*, 1988). Becker and Maiman refined this model by integrating distinct modifying factors; these include demographic characteristics such as age, sex, fundamental elements such as knowledge and prior experiences about the disease and socio-psychological factors such as social class and personality (Becker and Maiman, 1975). The definition and components of the HBM construct are presented in Figure 6-1. The model, which theorizes that individual behaviour is influenced by many interpersonal factors, such as knowledge, motivations, previous experience, and developmental history (Rimer and Glanz, 2005) has been applied to Arab women in previous studies (Azaiza and Cohen, 2006, Mikhail and Petro-Nustas, 2001). The model was adopted to better interpret the impact of early detection or screening for breast and cervical cancer. Many researchers currently utilize this model to guide the development of health interventions aimed at changing behaviours (Salman, 2012, Azaiza and Cohen, 2006, Ma *et al.*, 2013, Austin *et al.*, 2002) and it was used as a theoretical framework in this study to understand why women did not use cervical cancer screening as preventive services. In this study, all the participants were from Kirkuk/Iraq, in which the majority of citizens identify themselves as Arab, Kurdish or Turkman Muslim. Although the population is diverse, Muslim is a predominant religion as any other predominantly Muslim countries in the Middle East (Quiñones *et al.*, 2013). The term Arab is used to identify people who share the values and beliefs of an Arab culture in 22 countries including Iraq, Jordan, Yemen, Syria, Lebanon, Palestine, United Arab Emirates, Qatar, Oman, Saudia Arabia, Kuwait, Egypt, Tunisia, Maraca, Algeria, Libya and Sudan (USTDC, 2006). Citizens of

those countries share the Arabic language and follow the Islamic religion: Arab people are characterized by certain cultural beliefs, lifestyle, behaviour, values and health practices (USTDC, 2006). In terms of cervical cancer screening, authors of previous studies have reported that certain cultural and religious obligations are imposed on Arab Muslim Women and these affect their health practices, beliefs, behaviours and access to health care (El-Sayed and Galea, 2009).

Figure 6-1 Components of the Health Belief Model Glanz *et al.* (2008)



Because of religious and cultural prohibition and the importance of virginity, unmarried women are not expected to seek health care by doctors; cervical cancer for young and unmarried women is not considered an important issue (Salman, 2012).

The HBM suggests that, in addition to the effect of sociodemographic background and knowledge, the chance of performing certain behaviour increases when a patient believes that she is susceptible to the disease (Mikhail and Petro-Nustas, 2001). Thus, understanding the interaction between the socio-cultural environments and health behaviours of a population is necessary to help develop a culturally appropriate and effective screening programme. Behaviour change interventions which can be defined as a systematised activities prepared to change specified behaviour are essential to improve effective practice of public health (Michie *et al.*, 2011). The process of designing behaviour change interventions involves determining the strategy that will be adopted and then working on the specifics of the intervention design (Michie *et al.*, 2011)

Three classifications of health behaviour theories have been widely used to explain behaviours at different levels: intrapersonal theory, interpersonal theory, and community/group models (Esperat *et al.*, 2008). It is presumed that, at the interpersonal level, individual behaviour and health outcomes are probably influenced by their interaction with the social environment, while in the intrapersonal level commonly the focus is on the individual as a core constituent (Esperat *et al.*, 2008). A new behaviour framework proposed by Michie *et al.* (2011) is a 'behaviour system' involving three essential conditions: capacity, opportunity and motivation. This forms the core of a 'behaviour change wheel' (BCW) which is encircled by intervention functions and policies that could enable these interventions to occur (Michie *et al.*, 2011).

The implementation of evidence-based practice requires a convenient strategy for identifying interventions and linking them to the analysis of the targeted behaviour (Michie *et al.*, 2011). In order to identify the categories that are likely to be effective, it is crucial to discuss all available options and use a rational system to determine which to use (Michie *et al.*, 2011). The process of designing behaviour change interventions usually includes deciding the strategy that will be adopted, then working on the convenient intervention design (Michie *et al.*, 2011). Guidance from the UK Medical Research Council (Institute for Government, 2010) for developing and evaluating complex interventions recommends drawing on theory in intervention design (Michie *et al.*, 2011). Previous studies using HBM as a framework have found it to be useful in predicting who will undertake a variety of preventive health behaviour, for instance breast cancer screening. However, empirical evidence related to the application of HBM to predict cervical cancer screening remains minimal (Ma *et al.*, 2013). A review of literature reported strong support for the HBM's perceived benefit and barriers, but comparatively weak support for the HBM's perceptions of the disease in predicting cervical cancer screening behaviours (Tanner-Smith and Brown, 2010). Understanding the interaction between the health behaviours of the population and the socio-cultural environment is essential to assist in developing an effective and culturally acceptable screening programme (Esperat *et al.*, 2008).

In the following sections I will discuss the findings of this study using the HBM structure as a framework.

6.4.1 Perceived susceptibility

Perceived susceptibility refers to beliefs about the possibility of being affected by the disease (Glanz *et al.*, 2008). The HBM predicts that women will be likely to adhere to

cervical screening programme if they feel that they are susceptible to cervical cancer (Glanz *et al.*, 2008). For instance, women must believe that there is a possibility of being affected by cervical cancer before they have an interest in up taking the ST (Tavafian, 2012). Individuals vary in their perspectives on the vulnerability to develop a specific health problem (Gillam, 1991). A common emerging barrier to cervical cancer screening among women living in Kirkuk is their belief that cervical screening is unnecessary or it is just for unhealthy women and they perceive it as a diagnostic investigation rather than preventive health measures. If a woman understands how seriously cervical cancer may affect her life, her perceptions of the disease may motivate her to seek screening. In this study most women reported not receiving a physician's recommendation, however such a recommendation was a strong and consistent predictor for having a smear test, possibly because a recommendation would imply that the woman was susceptible to cervical cancer. Whether offered screening or not, the majority of women did not perceive their own vulnerability to the disease and did not see themselves at risk if they had no family history of cancer or if they were asymptomatic and feeling healthy . As a result, they are at increased risk for the disease because they rely on curative practices rather than use preventive health practices.

6.4.2 Perceived severity and benefit

Perceived severity refers to the severity of the health problem, as assessed by the individual (Hayden, 2013). If a threat is considered to be present for a serious disease for which there is a real risk, behaviour is likely to change as the perception of susceptibility is combined with the severity of in the perceived threat (Hayden, 2013). Therefore, when women perceive that their susceptibility to cervical cancer is increased (e.g.in the presence of risk factors such as HPV virus or smoking), they may be more willing to undergo screening. Accordingly, if women perceive benefits of regular

screening and the importance of early detection and prevention of cancer they may adapt to new behaviours, including participation in secondary prevention practices.

Perceived benefits play an important role in the adoption of secondary prevention behaviour such as screening for cancer (Hayden, 2013). People tend to adopt a new behaviour in order to decrease the risk of developing a disease; however, women must believe there are benefits in order to change. While the perception of seriousness is often based on medical information, it may also come from the person's beliefs on the consequences an illness might have on her/him (Hayden, 2013). Health promotion activities, such as education and supportive environments create opportunities for individuals and communities to understand factors that impact health and wellbeing and to necessary actions (World Health Organization , 2009)

6.4.3 Perceived barrier

The 'perceived barrier' construct demonstrates women's perspectives of the obstacles they might face if they decide to attend for the screening. This may refer to the potential negative aspects of particular health action that may act as an obstacle when undertaking recommended behaviour (Hayden, 2013). For example, the individual may expect benefits but there may be also barriers such as high expense, negative side effects, inconvenience, and use of time or unpleasantness (Tavafian, 2012).

In this study the majority of the respondents felt less susceptibility to cervical cancer and exhibited personal barriers such as cultural based embarrassments, beliefs that the disease is a punishment from the God, lack of belief that cancer can be cured and avoidance of the discussion of cancer. Although in this study differences may be explained by socio-psychological and personality factors, such as giving low priority to self-care in the presence of competing demands, the modifying variables are factors that

influence personal perceptions such as educational level, skills and experience and certain cues to action. The role of education level has been studied in previous studies in an attempt to improve utilization of screening. Lower education was linked to lower screening behaviour in previous studies (Soskolne *et al.*, 2007). Most of the participants of this study had not attended school beyond primary level (22.2 %), and 16.75% had not attended school, while just 5.6% had graduated from university. Studies have stated that poor literacy is associated with health inequalities including poor understanding and use of preventive measures and less access to health information (Hahn *et al.*, 2007).

Factors such as cultural beliefs and faith may also affect women's attendance for screening. In this study the respondents' fear of cancer was associated with a sense of fatalism about the cancer. Most believed that cancer cannot be cured, and the diagnosis meant death: this fear leads to avoidances of any discussion of cancers. If respondents believe that there is nothing one can do to prevent cervical cancer, this powerlessness may account for the anxiety associated with cervical cancer. In order for a new behaviour to be adopted, a person needs to believe the benefits for the new behaviour exceeds the consequences of continuing the old behaviour (Hayden, 2013). Culturally competent care (Figure 6-3) is based on the principles of social justice and culturally competent nursing care contributes to the reduction of health disparities through integrating of cultural beliefs into patient care and expanding access of vulnerable groups to healthcare services (Douglas *et al.*, 2014). Within the context of healthcare delivery, social justice is grounded in the belief that every individual is eligible to equal opportunities for healthcare and promoting culturally competent healthcare, which is a dynamic, lifelong learning process within the social justice framework (Douglas *et al.*, 2014). Human rights protects the people's right to access quality care and to be assured

of safe health care, which includes prevention of harmful traditional practices (Douglas *et al.*, 2014). The modifying variables must be seriously considered and policymakers and health care providers should pay more attention and allocate more resources to prevent poor outcomes.

Figure 6-2 Guidelines for the practice of culturally competent nursing care taken from Douglas *et al.* (2014)

Guideline	Description
1. Knowledge of Cultures	Nurses shall gain an understanding of the perspectives, traditions, values, practices, and family systems of culturally diverse individuals, families, communities, and populations they care for, as well as knowledge of the complex variables that affect the achievement of health and well being.
2. Education and Training in Culturally Competent Care	Nurses shall be educationally prepared to provide culturally congruent health care. Knowledge and skills necessary for assuring that nursing care is culturally congruent shall be included in global health care agendas that mandate formal education and clinical training, as well as required ongoing, continuing education for all practicing nurses.
3. Critical Reflection	Nurses shall engage in critical reflection of their own values, beliefs, and cultural heritage in order to have an awareness of how these qualities and issues can impact culturally congruent nursing care.
4. Cross-Cultural Communication	Nurses shall use culturally competent verbal and nonverbal communication skills to identify client's values, beliefs, practices, perceptions, and unique health care needs.
5. Culturally Competent Practice	Nurses shall utilize cross-cultural knowledge and culturally sensitive skills in implementing culturally congruent nursing care.
6. Cultural Competence in Health Care Systems and Organizations	Health care organizations should provide the structure and resources necessary to evaluate and meet the cultural and language needs of their diverse clients.
7. Patient Advocacy and Empowerment	Nurses shall recognize the effect of health care policies, delivery systems, and resources on their patient populations, and shall empower and advocate for their patients as indicated. Nurses shall advocate for the inclusion of their patient's cultural beliefs and practices in all dimensions of their health care.
8. Multicultural Workforce	Nurses shall actively engage in the effort to ensure a multicultural workforce in health care settings. One measure to achieve a multicultural workforce is through strengthening of recruitment and retention efforts in the hospitals, clinics, and academic settings.
9. Cross-Cultural Leadership	Nurses shall have the ability to influence individuals, groups, and systems to achieve outcomes of culturally competent care for diverse populations. Nurses shall have the knowledge and skills to work with public and private organizations, professional associations, and communities to establish policies and guidelines for comprehensive implementation and evaluation of culturally competent care.
10. Evidence-Based Practice and Research	Nurses shall base their practice on interventions that have been systematically tested and shown to be the most effective for the culturally diverse populations that they serve. In areas where there is a lack of evidence of efficacy, nurse researchers shall investigate and test interventions that may be the most effective in reducing the disparities in health outcomes.

6.4.4 Self-efficacy

In 1988, self-efficacy was added to the original four beliefs of the HBM (Hayden, 2013). Perceived self-efficacy is defined as a person's assessment to their ability to organise and achieve actions required to obtain specific types of performances (Parrott,

2001). It has been proven to be a powerful predictor of disease prevention and detection behaviour (Parrott, 2001). The HMB predicts that if a woman believes a new behaviour is useful (perceived benefit), but does not think she is capable of doing it (perceived barriers) predictions are it will not be tried (Hayden, 2013). In this study doctors reported that some of the women believed that ST is useful but, they were facing difficulties in arranging a time for attending clinic because of family commitments. A prior study reported family responsibilities might be a powerful obstacle from taking part in these types of health behaviours (Gillam, 1991). People believe that the ability of organizing their own behaviour has a critical role in predicting whether to participate in or to continue any kind of health promotion activity (Bandura, 1997). Self-efficacy as a predictor of health outcome shows positive relationships between self-efficacy and other variables, such as knowledge, barriers to performance and perceived social norms (Bandura, 1997).

Health communication specialists have specified that perceived self-efficacy is a crucial element of successful behaviour change (Parrott, 2001). Promoting women's self-efficacy through education and support may enhance changes in their behaviour. However, a study by Michie *et al.* (2011) reported that the HBM does not address the crucial roles of self-control, habits and associative learning and this study proposed 'behaviour change wheel' as a method for designing behaviour change interventions. A recent study by Abolfotouh *et al.* (2015), who used the HBM to predict the breast self-examination among Saudi women, reported high perception of self-efficacy increased the level of breast self-examination. However, few studies have been conducted on breast and cervical cancer screening among AMW and authors of none of these studies have investigated women's perceptions using HBM (Abolfotouh *et al.*, 2015).

6.4.5 Cues to action

Readiness to take action (based on perceived susceptibility and benefits) could be enhanced by other factors, especially by cues to promote action (Glanz *et al.*, 2008). For instance, women would be more likely to have preventive behaviour like up taking smear test if they are reminded by their health care providers. Previous studies reported recommendations by GPs as well as written and oral information as cues to action for cervical cancer screening (Tavafian, 2012). In this study most participants attended the unit of early cervical cancer detection as a result of their doctor's advice. So, doctors were proactive in encouraging women to uptake smear test. A study from another Arab country by Abdullahi *et al.* (2009) found that participants responded to verbal information better than written. Written cues were considered unsuitable cues to action by some because of a low level of literacy, even though others found it helpful. Many studies identified positive cues to cancer screening. These involved; physician recommendation, health workers advice, media and written materials (Tavafian, 2012) and authors of several studies reported that the involvement of the community was effective in the development, planning and the delivery of the screening services (Austin *et al.*, 2002).

Community outreach strategies are a common method of health promotion. This includes the use of appropriate language material, involvement of health workers and presentations at the workplace settings (Sharma, 2016). Other researchers found specific educational materials such as brochures, newspapers and media messages (TV, radio) to be an effective cues of action if delivered and implemented in a culturally meaningful and sensitive manner (Tavafian, 2012), and women in this study certainly mentioned television as a source of information for them. If perceived susceptibility or perceived

severity is low, and then a very intense stimulus is required as a cue to action, while when a perceived susceptibility or perceived severity is high, then even a minimal stimulus is sufficient (Sharma, 2016).

6.5 Strengths and limitations of the study

To the best of my knowledge, this doctoral study is the first to use mixed methods to gather evidence related to strategies to establish population-based cervical cancer screening in Kirkuk. It is also the first to include a preliminary theory on cervical cancer screening programme training among gynaecologists in Kirkuk. The thesis provides evidence of strategies to enhance the existing cervical cancer screening programme and to direct screening efforts where these are most needed. In the thesis, I further explored screening behaviour by taking an in-depth look at women's and doctors' experiences related to cervical screening in Kirkuk. By using a mixed methods approach, it was possible to investigate the experiences of the screening participants at a detailed level. Additionally, I explored the factors that have had impact on the cervical screening uptake among women in this region and the practical challenges facing healthcare professionals in order to establish a cervical cancer screening programme.

It is crucial to consider the methodological implication of this research. Combining qualitative and quantitative approaches in a single study is well accepted in health studies (Creswell *et al.*, 2011). The decision to combine qualitative and quantitative methods was based on the complex nature of the different factors that influence health and health seeking behaviours (Ivankova *et al.*, 2006). The semi-structured interviews offered the participants the chance to share their experiences and express their views in their own words. This gave a different insight and perspectives into participant's worldviews and helped me to better understand the complex issues related to topic area.

Further, an important aspect of qualitative research includes the consideration of the researcher's location and engagement in reflexivity (Corbin & Straus, 2008). My background as a female, born and bred in Iraq, where I have previous professional history, collegial relationships and aspirations for improving the health care services to the local community enabled me to gain deeper engagement and insight into participant's understanding of lived experience. However, the involvement of an Iraqi gynaecologist in the supervisory team added further meaning to the field experiences and helped in the recruitment process of the gynaecologists. More generally, I shared a history of lived experience with the women. This had a positive impact on my interaction with the participants as we share similar values which appeared to make the participants feel relaxed. Discussions related to my cultural background helped the process of gaining their trust and gave them the confidence to express their views about cervical cancer and faith-based practices related to cervical cancer. Whilst my interaction with women attending to their smear test appointments became friendly and encouraged a good discussion. I was therefore aware that the shared cultural values might also have introduced bias in to the analysis of the findings; hence it was important to be scrupulous in my interpretation and take the meaning directly from the data. During Interviews, I introduced myself and addressed the participants by their name in order to show respect. In conducting these interviews, I was aware of the lack of research conducted among women living in Kirkuk. I felt that I could add to this gap in the literature and have their voices heard. Also, I was conscious of the challenges related to the women's health literacy in terms of the formulation of the research questions. However, as much as I thought I had an understanding of cervical screening services in Iraq, I could not be completely familiar with the women's experiences, as they were from different ethnicities.

In reflecting on the method selected to analyse interview data, it is evident that the grounded theory approach worked well for the qualitative phase as it produced a basic framework for key categories to emerge from the data. Constructing an audit sequence, which included memos describing coding decisions with initial drawings of emerging linkages between themes and obtaining peer feedback on several interviews also increased the trustworthiness of the study. I classified codes and categories using phrases taken directly from participants to further ensure the emerging theory was grounded in the data. Further, this process enabled me to get an in depth understanding of the data which helped me to develop the preliminary theory regarding barriers to screening and professional gaps in knowledge, which had an important impact on achieving the objectives of my study.

Regarding the quantitative study (Phase three), I implemented an intervention (educational training programme) for the gynaecologists and nurses working in teaching hospitals in Kirkuk and one of the strengths of the study was the collaboration with experienced professionals from the Birmingham City University and Birmingham Women's Hospital.

As with all research studies, limitations exist. Although the mixed methods approach outlined here adds original methodological value to qualitative understanding of this field, it could be argued that the qualitative element in particular is less credible. Grounded theorists, for example, often require longer immersion in the field (Creswell *et al.*, 2011). In the initial Phase of this study, I conducted a cross sectional study among 25 women attending an appointment for smear test. The biggest challenge I experienced in this stage was inability of the women to engage with the research topic due to their health literacy regarding cervical cancer and cervical cancer screening. Additionally, due to the small sample size and women's health literacy, it was not

possible to statistically analyse the preliminary study data (Lancaster *et al.*, 2004). However, this preliminary study was helpful as it enabled me to develop the questionnaire of the qualitative phase (two) to explore women's experiences with the cervical cancer screening in Kirkuk, Iraq. Regarding Phase three, limitations centred on the quality of the data as most of the participants were not familiar with cervical cancer and cervical screening and most of them stated that this was the first time they attended the Unit of Early Detection for Cervical Cancer to undertake smear test. However, even discovering that women knew very little was a finding in itself.

It is a limitation of my study that in Phase three I did not survey all the general practitioners who were working in Health Care Centres and who were not conducting cervical cancer screening because of unavailability of the screening in general practice in Iraq. Therefore, the findings may not represent the experience and knowledge of all GPs in the city.

The involvement of the women and gynaecologists in this study enabled me to look at the research question from the views of both providers and users of a cervical screening service. The qualitative phase helped me to identify more detail about the lived experience of women who decided to undertake smear test. Further, the qualitative phases also captured the important challenges facing the gynaecologists and have had impact on their experiences in terms of cervical screening programme. In addition, the qualitative method gave me the flexibility to ask follow-up questions and allowed the exploration of other issues that emerged from the semi-structured interviews. Additionally, the use of grounded theory for analysing the data helped me to get an in-depth understanding of the data, which enabled the development of a preliminary theory in the data and informed the study intervention. As discussed, the triangulated approach to data collection and analysis offered breadth and depth to the study. By combining

qualitative and quantitative methods in this doctoral study, I was able to allow an emergent theory to develop around the challenges facing the healthcare system in Kirkuk in order to establish the cervical cancer screening programme; each method was used as in an iterative fashion as a basis for the following phase. My data suggest that the gap in knowledge among gynaecologists and nurses on cervical cancer screening programme, together with lack of the capacity and infrastructure impacts upon the establishment of population based cervical screening programme in Kirkuk. Further, women's health literacy and their perception of cervical cancer with the stigma around the word 'cancer' may have further impact on cervical screening programme. The mixed method approach used in this study can be adopted by others to acquire breadth and depth of evidence in similarly complex health care situations in Iraq.

6.6 Implication of the study

The findings from this study have potential implication for health promotion and screening interventions in Iraq. Results from all phases highlight the importance of initiating population-based cervical screening among women in Kirkuk, with a considerable need for implementing interventions targeting the eligible women aged 25-64 years. It is important to start with the promotion and delivery of cervical screening at a targeted population-level. Not only this, but we also need interventions to raise the awareness of targeted women about cervical cancer and cervical cancer screening to start to address their barriers to screening. It was clear that having a doctor's recommendation to have smear test was important to women. Therefore, it is imperative to publicise the supportive and educational role of the gynaecologists, nurses and other health professionals. Findings of this study revealed that nurses are not involved in the smear test process in this country. Nurses represent the largest sector of health professionals; therefore, providing adequate training on cervical cancer screening

for nurses could also be effective in improving women's awareness and performance. Training programmes for nurses and health education programmes about smear test and screening would be beneficial to reduce the lack of women's awareness regarding cervical cancer and cervical screening. Health education programmes which are effective not only in increasing knowledge, but also in bringing about positive effects on health literacy in women related to smear test, should be organized to increase smear test uptake among women living in Kirkuk.

Health promotion efforts and interventions should consider the cultural barriers that influence the screening behaviour among women living in Kirkuk and Iraq. Findings of this study suggest that improving knowledge about cervical cancer screening and cervical cancer among healthcare professionals may increase screening utilization. Thus, tailoring public health messages and interventions to the targeted women is crucial for uptake of smear test and should take into account the health literacy levels of the targeted population. For example, cervical cancer screening messages targeting women should incorporate images with written messages, and use of videos would enable women who are not literate to receive the message. Women participants also communicated their interest in learning more about smear test and disseminating knowledge on the purpose and importance of cervical screening. They argued that talking about cervical screening in the media; especially television could play an effective role in educating women. They also recommended using special teams (of health professionals) to visit women at home to raise their awareness of the cervical screening. In doing so, women may be more likely to have better understanding of what to expect during the smear test.

Barriers such as embarrassment and lack of knowledge regarding smear test can be overcome through a good relationship between patient and physicians (Donnelly and

Hwang, 2015). Therefore, considering the influence doctors have on the care of women as reported by most women in this study, they should utilise their relationship with women to promote this important preventive healthcare practice. Furthermore, high attention needs to be given to patient-centred competent healthcare. Training for healthcare professionals must strengthen cultural competent, incorporating it throughout a practitioner's medical education (MacLeod and Frank, 2010).

As the study revealed that in most cases cervical screening were opportunistic, programmes supporting equitable access to cervical screening are essential, and women who may not have the same level of access to cervical screening should be identified and supported. Public health efforts may also be directed to provide women with knowledge and practices to become proactive in their health care. It is imperative to facilitate and establish linkage between women and the health care system. Although, comprehensive organized screening programmes have yet to be established in Kirkuk, it is helpful to produce brochures/ leaflets on smear test, the process of sample taking and the benefits of the screening throughout the primary health care centres to every eligible women to motivate them to attend for cervical screening. Further, health programmes focused on delivering screening messages and facilitating the process of obtaining smear test should be continued.

This study revealed that there was agreement among the gynaecologists on the need to use the HPV vaccination in a targeted population. Gynaecologists frequently declared their need for training courses on the updating in the recent development in cervical prevention issues. Most of the gynaecologists stated that cervical screening was not part of their education and training, nor was it included in their clinical practices in the health care centres. Inclusion of these issues in the basic training and continuing

education of specialist gynaecologists is also essential to ensure new specialists are equipped to deal with screening of women.

6.7 Contribution of the study

These findings have informed the research policy; the mixed methods design enabled me to identify the gap in knowledge among gynaecologists and informed the development of an educational training intervention to promote cervical screening knowledge and practice among gynaecologists and nurses. Overall, this study has made a contribution to the understanding of the reinforcing factors impacting on the screening practices. This contribution will be useful in providing policy makers, researchers and programme managers with empirical evidence on cervical cancer screening services in Kirkuk, Iraq. Further, the findings provide some valuable data that can inform further studies seeking the improvement of the cervical cancer screening services. Clearly though, the front line are not ready yet to implement the cervical screening programme. The mixed method approach used in this doctoral study brings to the light evidence needed to support and facilitate the promotion of cervical cancer prevention services among targeted women in Iraq and provide several practical contributions to the policy makers of the Iraqi Ministry of Health. These are described in the following subsection.

6.7.1 Contribution of the study to the Iraqi Ministry of Health

As a result of my findings, I make the following suggestions for consideration by the Iraqi Ministry of Health:

- 1- Consider the implementation of a population- based cervical cancer screening programme in order promote cervical cancer prevention services among targeted women living in Iraq.
- 2- Consider the shortage of trained staff, lack of knowledge among gynaecologists and nurses and develop training courses on smear test and a cervical cancer screening programme.
- 3- Develop clear and simple educational messages on cervical cancer and the screening test that can easily be understood by the targeted women to raise their awareness regarding the importance of cervical cancer screening.
- 4- Consider the impact of the current refugee crisis on women's health and wellbeing and facilitate the process of cervical cancer screening by initiating smear testing in the primary health care centres.
- 5- Increase the focus on the health literacy programmes which include cervical cancer and cervical screening, specifically the cause risk factors of cervical cancer and the benefits of screening services.
- 6- Increase the focus on the interventions that facilitate the access to the cervical screening services, such as, invitation and follow up letters incorporated with educational leaflets on the ST and the screening process.
- 7- Provide education for cervical cancer screening providers in order to increase their cultural competence, understanding the influence of the culture on the screening behaviours.

- 8- Develop programmes that aim to create awareness among professionals Iraqi women about the self-collection sample for HPV test.
- 9- Integrate cervical screening services with the antenatal care services in primary health care centres.
- 10- Introduce the gradually introducing of systematic prophylactic HPV vaccination in all provinces of Iraq targeting girls aged 13-18 years.

6.8 Direction for future research

Literature reviews have indicated that there were no studies focusing on the barriers to establish cervical cancer screening programme in Iraq. So far, few studies have surveyed randomized samples of women to assess their knowledge on the HPV test. The findings of this study showed that in most cases the doctors only recommended HPV testing after an abnormal Smear test. Meanwhile no systematic prophylactic HPV vaccination has been introduced. Far too little attention has been paid to cervical cancer in Iraq. However, no studies have been found to explore the interventions that have been implemented to increase the uptake of smear test in Iraq. The present study contributes to the literature by providing evidence on the current cervical cancer screening services in Kirkuk, Iraq. Based on the study findings I propose the following recommendations:

- 1- Adding and offering smear test services to every primary health care centres in all Iraqi provinces and initially integrating cervical screening with the antenatal care services to facilitate women's access to the uptake of smear test.
- 2- Develop training programmes for medical staff and nurses the primary health care centres and hospitals on smear test techniques.
- 3- Create educational materials (leaflets and brochures) about smear test and cervical screening to be placed in waiting rooms and outpatient clinics of

doctors and general practitioners to raise women's awareness about cervical cancer and prevention.

6.8.1 Recommendation for further research

To inform achievable programme interventions aiming to improve the cervical cancer screening services among the targeted women in Iraq, the following recommendations have been formulated:

- 1- Extend this study on evidence –based strategies to establish cervical screening programmes in Iraq. Similar studies need to be conducted in other areas of the country to compare and generalize the findings.
- 2- Determine strategies to enhance communication and utilisation of health services to those women who are eligible for cervical screening.
- 3- Investigate knowledge of cervical cancer screening among nurses in Iraq, for example via qualitative studies.
- 4- Explore cervical cancer screening practices and the role of nurses in taking the smear test in Iraq, for example using a mixed method explanatory study.
- 5- Add to the current findings, using a qualitative study applying the Health Belief Model to investigate health seeking behaviours related to cervical cancer among women living in Iraq and their response to illness and the diagnosis of cervical cancer.
- 6- Determine the content of health education messages that should be provided to those women who are eligible for cervical screening to raise women's awareness on the cervical cancer screening and investigate the impact of written information materials provided by healthcare professionals to improve women's attendance to cervical screening in Iraq.

- 7- Investigate the impact of opportunistic cervical screening on women's health in Iraq.
- 8- Identify possible information gaps and communication challenges between women and professional health carers.
- 9- Explore HPV testing awareness and practices among healthcare professionals in Iraq.
- 10- Compare the impact of HPV testing with the smear test for primary screening of cervical cancer.
- 11- Investigate evidence based strategies to establish HPV vaccination in Iraq

6.9 Conclusion

Overall, the result of this study provides evidence of the need to enhance cervical cancer screening services to be established in Iraq, which should include *human papillomavirus* testing. Women in Iraq are more likely to be diagnosed at advanced stage of cervical cancer. Eligible women in the Iraqi population should therefore be targeted by cervical cancer screening and health education programme. Further, the findings of the study highlight the importance of initiating smear test testing in primary health care settings in Iraq. The focus should be on the policy making context, improving cervical screening infrastructure and making the service better accessible to women.

The findings revealed that there is an imminent need for developing cervical cancer intervention programmes and an awareness campaign targeting women and healthcare professionals to promote and improve cervical cancer prevention methods. Although most women participants had limited or no knowledge about cervical cancer screening and smear testing, most demonstrated their willingness to undertake the test. This

suggests that there is role for a community and culturally sensitive health education approach to raise their awareness and promote regular screening.

The study also identified the need for intensive training and periodic sessions for healthcare professionals to be more effective human resources for a cervical cancer screening programme. Taking this conclusion in to consideration, this thesis provides the evidence based strategies to implement population based cervical screening in Iraq. The implementation of this service will require training of additional nurses who are already ideally placed in primary healthcare centres. The discussions with nurses who attended the training session indicate they are willing to enhance their practice and participate in this service.

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Appendix A –Approval by Faculty Research Ethics Committee by Plymouth University [10th November 2014]



10th November 2014

CONFIDENTIAL

Suhailah Ali
PhD student
School of Nursing & Midwifery
Faculty of Health, Education and Society
Plymouth University
Portland Mews
Buckland House
3rd floor, PL4 8AA

Dear Suhailah

Application for Approval by Faculty Research Ethics Committee

Reference Number: 14/15-338

Application Title: *Barriers to cervical cancer screening in Kirkuk city.*

I am pleased to inform you that the Committee has granted approval to you to conduct this research.

Please note that this approval is for three years, after which you will be required to seek extension of existing approval.

Please note that should any MAJOR changes to your research design occur which effect the ethics of procedures involved you must inform the Committee. Please contact Sarah Jones (email sarah.c.jones@plymouth.ac.uk).

Yours sincerely

Professor Michael Sheppard, PhD, FAcSS
Chair, Research Ethics Committee - I
Faculty of Health & Human Sciences and
Peninsula Schools of Medicine & Dentistry

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Professor Michael Sheppard
CGSW BSc MA PhD FAcSS
Chair, Faculty Research Ethics
Committee

Appendix B-Approval by Iraqi Ministry of Health, Kirkuk Health Directorate [26th June 2014]

Ministry of Health
Kirkuk Health Directorate
General Director office
Training center and development
Knowledge and research unit
No\ 1555
Date \ 26/6/2014

((Together to support our brave troops to defeat terrorism))

To \Teaching Azadi Hospital
Subject \Task Facilitate

Greetings

A according to the letter that issued from Kirkuk University / College of Nursing No. 1525 in 18/06/2014

Agreement had got of the Scientific and ethics Committee of research to facilitate the task of PhD student / (Suhailah Mohammed Ali) for the purpose of completing the requirements of her research (Barriers to cervical cancer screening in Kirkuk city) and give assistance as your rules and we do not bear any financial implications and does not affect to your works

Sabah Ameen Ahmed Aldawodi
General Director
26/6/2014

Adnan Baker Ali signature

A copy
Ministry of health \minister office \ training center \administration of knowledge and researchwith respect
Kirkuk University / College of Nursingwith respect

General Kirkuk Hospital
Kirkuk first sector
Kirkuk second sector } same propose with respect



Appendix C- Updated United Kingdom (UK) criteria for appraising the viability, effectiveness and appropriateness of the screening programme GOV.UK (2015)

The condition	The condition should be an important health problem considered by its frequency/ severity and the incidence, prevalence should be understood
	There should be stringent evidence on the association between the disease marker and serious or treatable disease
	All the primary prevention interventions should have been implemented, provided that is reasonable
	If the carriers of an alteration are identified as a result of screening, the natural history of the people with this status should be understood, including psychological implications
The test	There should be a simple, safe and validated screening test
	The test should be acceptable to the target population
	There should be agreed policy on the future diagnostic investigation of individuals with a positive test result and on the choices available to those individuals
	The distribution of the test values should be known and a suitable cut-off level agreed
	If the test is for a particular mutation or set of genetic variants, the method for their selection should be clearly set out

The intervention	An effective intervention for patients identified through screening with evidence that intervention at a pre-symptomatic phase results in better outcomes for the screened individuals
	Agreed evidence based policies covering target individuals and offering the appropriate intervention
The screening programme	Evidence from high quality randomised controlled trails that the screening programme is effective in reducing mortality or morbidity. Also, the information that is provided about the test and its outcome must be understood by the individual being screened
	Evidence that the complete programme, which consists of test, diagnostic procedures, treatment and intervention, is clinically, ethically and socially acceptable to health professionals and the public
	The benefit of the screening programme should exceed the harms, for instance, from over diagnosis, overtreatment, false positives, false reassurance, uncertain findings and complications
	The cost of the whole screening programme should be economically balanced
Implementation criteria	Clinical management of the condition and patient outcomes should be optimized in all health care providers prior to participation in a screening programme
	Plan for managing and monitoring the screening programme and agreed set of quality assurance standard

	All options for managing the condition should be considered (e.g. improving treatment and providing other services)
	Adequate staffing and facilities for testing, diagnosis, treatment and programme management should be available prior to the launch of the screening programme
	Evidence –based information clarifying the objectives and the possible consequences of screening, investigations and treatment should be made available to potential participants to help them in making an informed choice
	Public pressure for widening the eligibility criteria for reducing the screening interval and for increasing the sensitivity of the testing process should be predictable. Decision about the parameters should be scientifically justifiable to the public

Appendix D– Approval by Iraqi Ministry of Health, Kirkuk Health Directorate for conducting the study intervention (education training programme) [4th August 2016]

Ministry of Health
Directorate of Kirkuk Province Health
Department of Planning & Resources Development
Center of Training & Cadres Developing
No. 16149
Date: 04-08-2016

To: University of Kirkuk
Subject: Scientific Course

Best regards...
Your book No. 949 in 19-06-2016..
We would like to inform you about executing of (Modern techniques about early detection for cervix uteri cancer) course in our directorate / Azadi Teaching Hospital for two days 18-19/07/2016 by PhD student (Suhailah Mohammed Ali) and by supervising of Dr. Ayla Khidir Ghalib and by participating of the persons in our enclosed list...

Please for knowing, with respect.

Attachments:

* List of participated names.

Dr. DARYA AHMED SAEED
From; General Manager
03-08-2016



Appendix E– Email correspondence with the manager Birmingham Cytology Training Centre (Sample Taker Introductory training Course) [18th May 2016]



Maureen Frost <Maureen.Frost@bwnft.nhs.uk>

Thu 12/05/2016, 11:21

Suhailah Ali; Louise Bradley <Louise.Bradley@bwnft.nhs.uk>; Heather Skirton; Craig Donaldson; 'Maria Tighe Clark' <m.t.clark@bham.ac.uk>

Reply all | v

Inbox

The message sender has requested a read receipt. To send a receipt, [click here](#).

Dear Suhaila,

Further to Maria's email, you are very welcome to sit in on the Sample Taker Introductory Training Course on 18th May at BCU. There will not be a charge for this and perhaps there will be an opportunity for you to share some of your experiences of screening in Iraq with the group.

Louise Bradley, course administrator will send you an application form and full details of the course.

I look forward to meeting you on 18th, but if you have any further questions, please do not hesitate to contact either me or Louise.

Kind regards,

Maureen

Maureen Frost

Consultant BMS Cytology
Manager Birmingham Cytology Training Centre
HBPC
Birmingham Women's NHS Foundation Trust
Norton Court
Edgbaston
Birmingham B15 2TG

Tel: 0121 623 6919/0121 627 2721

Fax: 0121 627 2624

E-mail: maureen.frost@bwnft.nhs.uk / maureen.frost@nhs.net

Website: <http://www.bwnft.nhs.uk/professionals/cytology-training-centre/>



Louise Bradley <Louise.Bradley@bwnft.nhs.uk>

Fri 13/05/2016, 11:18

Reply | v

STIT -BCU- Program... 376 KB
 City University Map_2... 804 KB
 City_South_Campus_... 16 KB

Show all 3 attachments (1 MB) Download all Save all to OneDrive - University of Plymouth

Hi Suhailah,

Further to your recent emails with [Maureen](#), please find attached a copy of the course programme for our Sample Taker Introductory Training Course on Wednesday 18th May 2016 together with maps/directions to the Birmingham City University.

We have decided you do not need to complete an application form as you will be observing the course.

Please do not hesitate to contact me should you require any further information.

Kind regards,

Louise

Louise Bradley
Course Administrator
Birmingham Cytology Training Centre
Birmingham Women's Hospital
Birmingham Women's NHS Foundation Trust
Norton Court
Mindesohn Way
Edgbaston,
Birmingham B15 2TG
Tel No: 0121 627 2721
Fax no: 0121 627 2624
Web site: <http://www.bwnft.nhs.uk/healthcare-professionals/courses-and-training/cytology-training-centre>

Please note my working hours are: 9.00am to 2.00pm – Monday to Friday





Maureen Frost <Maureen.Frost@bwnft.nhs.uk>

Fri 20/05/2016, 10:06



Dear Suhailah,

I'm pleased that you were able to attend the course on Monday and that you found the day useful. It was lovely to meet you.

Emily Dolphin, the nurse colposcopist at Birmingham Women's Hospital may be able to help you with being able to observe cervical samples being taken. I have copied Emily into this email so that you can contact her directly.

Kind regards,
Maureen

Maureen Frost
Consultant BMS Cytology
Manager Birmingham Cytology Training Centre
HBPC
Birmingham Women's NHS Foundation Trust
Norton Court
Edgbaston
Birmingham B15 2TG

Tel:0121 623 6919/0121 627 2721

Fax:0121 627 2624

E-mail:maureen.frost@bwnft.nhs.uk / maureen.frost@nhs.net

Website: <http://www.bwnft.nhs.uk/professionals/cytology-training-centre/>



Emily Dolphin <Emily.Dolphin@bwnft.nhs.uk>

Thu 26/05/2016, 12:10



Good Afternoon,

I have looked at the clinics for those dates you have given me on the Monday morning you are welcome to come along to colposcopy and sit in with our consultant lead Miss Byrom as she has a mixed clinic of cytology samples and treatments. However if you would like to sit in with myself I seem to have what looks like a diagnostic colposcopy clinic on the Tuesday 14th June which at the moment its filled with borderline and low grade cytological abnormalities. Please let me know if any of these clinics suit you?

Kind Regards,

Emily



Appendix F- Integrative review of cervical cancer screening in Western Asian and Middle Eastern Arab countries

Received: 17 August 2016 | Revised: 12 July 2017 | Accepted: 20 July 2017
DOI: 10.1111/nhs.12374

WILEY **Nursing & Health Sciences**

REVIEW ARTICLE

Integrative review of cervical cancer screening in Western Asian and Middle Eastern Arab countries

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Funding information

Iraqi Ministry of Higher Education

Abstract

Population-based screening programs have resulted in minimizing mortality and morbidity from cervical cancer. The aim of this integrative review was to explore the factors influencing access of women from Western Asian and Middle Eastern Arab countries to cervical cancer screening. A systematic search for studies conducted in Arab countries in those regions, and published in English between January 2002 and January 2017, was undertaken. Thirteen papers were selected and subjected to quality appraisal. A three step analysis was used, which involved a summary of the evidence, analysis of both quantitative and qualitative data, and integration of the results in narrative form. Few population-based cervical cancer screening programs had been implemented in the relevant countries, with low knowledge of, and perceptions about, cervical screening among Arab women, the majority of whom are Muslim. Factors affecting the uptake of cervical cancer screening practices were the absence of organized, systematic programs, low screening knowledge among women, healthcare professionals' attitudes toward screening, pain and embarrassment, stigma, and sociocultural beliefs. Policy changes are urgently needed to promote population-based screening programs. Future research should address the promotion of culturally-sensitive strategies to enable better access of Arab Muslim women to cervical cancer screening.

KEYWORDS

Arab countries, cervical cancer, cervical screening, Muslim women, Papanicolaou smear

1 | INTRODUCTION

The Papanicolaou (Pap) smear is a cytological cervical screening test offered to women to detect precancerous stages of endocervical cancer, enabling an approximately 75–90% reduction in the prevalence of cervical cancer (Sankaranarayanan, Gaffikin, Jacob, Sellors, & Robles, 2005). The aim of regular cervical screening is to detect abnormal cells in the cervix to facilitate early treatment and achieve more clinically-effective treatment, with greater cost efficiency (Dunleavy, 2008). It is predicted that by 2030, approximately half a million women will die from cervical cancer annually, with more than 95% of these deaths occurring in low- and middle-income countries (McGraw & Ferrante, 2014). Although it is evident that cervical cancer screening contributes to the reduction in the development of cervical cancer and the associated mortality rate, screening can also

have adverse effects, including psychological effects, such as anxiety, depression and distress associated with abnormal cytology test results (Habbema et al., 2017; Rahangdale, 2016). In addition, Habbema et al. (2017) studied adverse effects resulting from cervical cancer screening in the USA and the Netherlands, and demonstrated that treatment of precancerous lesions might lead to unfavorable consequences, including preterm delivery.

Cervical cancer screening that builds upon the use of the Pap smear examination has been implemented in developed countries, and is considered to be the main reason behind the significant reduction in rates of cervical cancer morbidity and mortality (Donnelly et al., 2013; Obeidat, Amarin, & Alzaghaf, 2012). In the UK, government response to the latest report on health screening stated that up to 5000 lives were saved every year by the use of regular cervical cancer screening (Department of Health, 2015). However, in developing countries, due

to the absence of national population-based cervical cancer screening programs, most cervical screening is administered opportunistically (Obaidat et al., 2012). Despite the fact that cytology screening programs have been introduced in several developing countries, particularly in Latin America, they do not appear to have reduced the rate of cervical cancer (Zeferino & Derchain, 2006). Sankaranarayanan, Budukh, and Rajkumar (2001) identified technical obstacles affecting the impact of such programs, for example suboptimal cytology, poor quality control, and issues concerning the follow up and management of the diagnosed women. In addition, there are problems concerning the uptake of such programs. Women might not be aware of the benefits of cervical screening due to poor public health education, while sociocultural health beliefs and gender roles have been identified as other potential barriers (Bush, 2000; Markovic, Kesic, Topic, & Matejic, 2005).

It is crucial to raise the uptake of cervical cancer screening in order to control this disease through early detection and management of the premalignant alteration prior to progressing to malignancy (Were, Nyaberi, & Buziba, 2011). It has been suggested that middle-income developing countries, where screening is inefficient, should reorganize their programs, taking into account experiences from other countries and lessons learnt from their past failures (Sankaranarayanan et al., 2001). Typically, the major barrier to cervical cancer prevention is not the cost of the screening test, which is relatively inexpensive, but the cost and complexity of providing the infrastructure required for the screening program (Wright & Kuhn, 2012). While findings from cost effectiveness analyses will impact and inform decision-making regarding healthcare interventions, national policies are needed to allocate resources for both cancer and screening program control, particularly in low-resource countries (Garrido-Cumbrera, Borrell, & Palencia, 2010). Salman (2012) stated that there is insufficient research on access to cervical cancer screening among Arab Muslim women (AMW) in Western Asia and the Middle East, and as a result, there is no consensus on how access to cervical screening services should be considered. However, screening uptake among AMW has been observed to be linked substantially with religion and culture, alongside knowledge of the clinical features of cervical cancer (Khan & Woolhead, 2015). The cultural and religious factors pertinent to AMW, such as the value placed on modesty and premarital virginity, contribute to their unwillingness to seek cervical health care (Salman, 2012).

For the purpose of this review, and building upon the geographic framework provided by Moore (2013), we used "AMW" to refer to Muslim women living in predominantly Western Asian and Middle Eastern Arab countries: Oman, United Arab Emirates (UAE), Bahrain, Lebanon, Kuwait, Syria, Qatar, Palestine, Iraq, Saudi Arabia, Yemen, and Jordan.

This review is part of a larger study entitled "Evidence-based strategies to establish population based cervical cancer screening in Iraq", with the long-term goal of improving women's health in Iraq by increasing the number of women with access to cervical screening. Unfortunately, in the past decade, there has been a dramatic lack of research on cervical cancer and cervical cancer screening in Iraq because the country has no population cervical screening program. Although it is universally acknowledged that there are considerable barriers to establishing and maintaining cervical cancer screening

programs, particularly in developing countries (Ansink, 2007), there are additional potential barriers to setting up cervical cancer screening programs in Iraq. Decades of war, sanctions, and years of Iraqi isolation and disorder have led to loss of clinical research capacity (Al Hilfi, Lafta, & Burnham, 2013), demonstrated by a lack of evidence on country-specific barriers to cervical cancer screening among this population. The vast majority of the population of this Arab Middle Eastern country is Muslim. Thus, this integrative review focused on factors that affect the access of AMW living in Western Asian and Middle Eastern Arab countries to cervical services, as well as interventions that have been implemented to increase the uptake of cervical cancer screening in those countries. The results were used to inform interventions to improve screening practices in Iraq.

2 | STUDY AIM

The aim of the review was to identify and assess evidence-based strategies to establish cervical screening programs in predominantly Western Asian and Middle Eastern Arab countries. The objectives were to:

- Explore interventions that have been implemented to increase the uptake of cervical cancer screening in Western Asian and Middle Eastern Arab countries.
- Identify factors that have had an impact on the access of AMW to cervical cancer screening services.
- Identify nursing initiatives used in the relevant countries to facilitate the development of a cervical screening program.

3 | METHODS

A systematic review involves a structured process to identify, select, and synthesize all high-quality research evidence relevant to a specific question (Bettany-Saltikov, 2012). We searched relevant databases (Joanna Briggs Institute and Cochrane Library) and could not identify previous relevant reviews of the evidence on this topic. Therefore, to answer the research question regarding factors affecting implementation and uptake of cervical screening in Western Asian and Middle Eastern Arab countries, an integrative review based on established guidance for undertaking reviews in health care by the Centre for Reviews and Dissemination (2009) was undertaken. The review focused on the interventions already implemented to increase cervical cancer screening uptake, considering all factors relating to intervention strategies for cervical cancer screening in Western Asian and Middle Eastern Arab countries.

3.1 | Data sources and searches

A systematic search for English-language studies published between January 2002 and December 2017 was undertaken. Five relevant databases were searched: CINAHL Plus, AMED, MEDLINE, Scopus, and Google Scholar.

3.2 | Keyword searches

Keyword searches centered on "cervical screening" OR "Pap'smear" AND Arab OR Muslim OR Iraq OR Kurdistan OR Jordan OR Qatar OR Saudi Arabia OR Kuwait OR United Arab Emirates OR Lebanon OR Syria OR Palestine OR Oman OR Bahrain OR Yemen were used as the primary terms. When searching Google Scholar, we also added the term "barriers".

3.3 | Inclusion and exclusion criteria

Papers were considered for inclusion if they: (i) were based on research studies undertaken using any research method; (ii) focused on cervical screening in Western Asian and Middle Eastern Arab Muslim countries; and (iii) included data on barriers or factors affecting the uptake of cervical screening.

Papers were excluded if they focused on laboratory testing or reported data on AMW living outside the regions that were the focus of this review.

3.4 | Search outcome

The study selection process is represented in a Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) flowchart (Figure 1). The initial search revealed 621 articles; 78 duplicates were removed. After reviews of the titles and abstracts, 526 articles were excluded (Figure 1). Seventeen papers were assessed as potentially relevant. Two were related to general gynecological cancer services in Arab countries (Ortashi & Al Kalbani, 2013) and general cancer control in the Gulf (Al-Othman et al., 2015). Empirical research was not reported in two papers (Al-Mandeel et al., 2016, K. Sait, Bentley, Anfinan, & Power, 2012), leaving 13 for inclusion in the integrative review.

3.5 | Quality appraisal

A quality appraisal of the 12 selected quantitative studies was undertaken by two of the authors (SA and HS) using QualSyst, the standard quality assessment criteria for evaluating original research papers from a variety of fields (Kmet, Lee, & Cook, 2004). Fourteen questions were used to appraise the methodological quality of each quantitative study, and 10 were applied to the qualitative study. Each question was allocated an outcome: not addressed, partially addressed, or satisfactorily addressed. Any disagreement about the assessment of papers was discussed until consensus was reached. Relevant remarks regarding the quality of each paper are included in Tables 1 and 2, respectively.

3.6 | Data analysis

Twelve of the 13 included studies utilized quantitative methods, and one was based on a qualitative design. It was not appropriate to conduct a meta-analysis due to disparity in design, study populations (e.g. women attending screening, women attending clinics not connected with screening, healthcare professionals) and research focus (e.g. knowledge of screening, impact of insurance coverage, training needs of professionals). For this reason, we used the guidance on analysis of diverse studies to produce an integrative review (Whittemore & Knaf, 2005). Initially, we summarized each paper (Table 3). Two researchers then independently combed each paper for relevant results or findings using a predetermined set of criteria related to the research objectives; these data were displayed in a matrix of codes (Whittemore & Knaf, 2005). We then compared the codes extracted from each paper across the total set of papers to

FIGURE 1 Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) flowchart of study selection

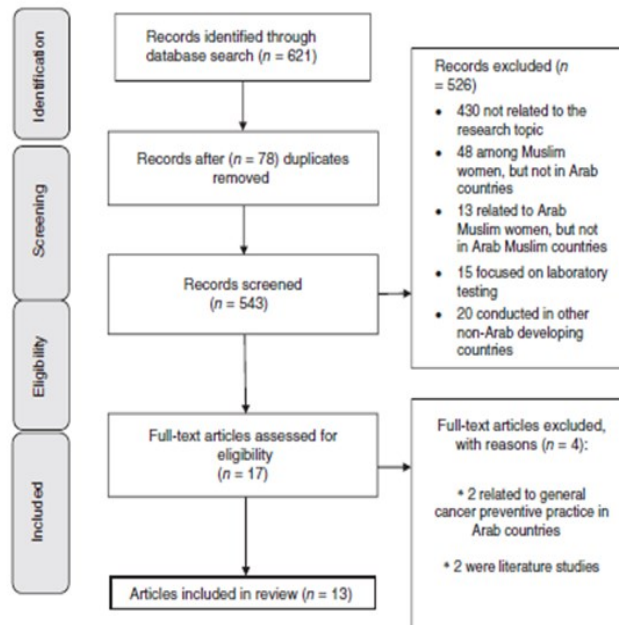


TABLE 1 Quality scoring (quantitative studies)

	Saudon et al. (2012)	Hwald (2013)	K. H. Salt (2009)	Badrinath, Ghazal-Aowad, Orman, Deemas, and Barakat (2002)	Al-Saifi & Mohamed (2007)	Obeidat et al. (2012)	Al-Meer et al. (2009)	Amarin et al. (2006)	El-Hammal et al. (2008)	Barbouth, Takraf, and Froelcher et al. (2004)
1. Question/objective clearly described?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2. Study design evident and appropriate	Yes	Yes	Yes	Partial	Partial	Yes	Partial	Yes	Yes	Yes
3. Method of subject/comparison group selection or source of information/input variables described and appropriate	Yes	Partial	Partial	Partial	Yes	Yes	Yes	Partial	Partial	Yes
4. Subject (and comparison group, if applicable) characteristics sufficiently described?	Yes	Partial	Yes	Partial	Yes	Partial	Yes	Yes	Yes	Yes
5. If interventional and random allocation was possible, was it described?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6. If interventional and blinding of investigators was possible, was it reported?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7. If interventional and blinding of subjects was possible, was it reported?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8. Outcome and (if applicable) exposure measure(s) well defined and robust to measurement/misclassification bias? Means of assessment reported?	Partial	Yes	Partial	Partial	Partial	Partial	Yes	Partial	Partial	Partial
9. Sample size appropriate	Partial	Partial	Yes	N/A	Yes	N/A	Yes	Yes	Yes	Yes
10. Analytic method described/justified and appropriate?	Yes	Yes	Yes	Yes	No	Yes	Yes	Partial	Yes	Yes
11. Some estimate of variance is reported for the main result?	Yes	No	No	No	No	Yes	Partial	Yes	Yes	No
12. Controlled for confounding?	N/A	No	No	N/A	N/A	No	N/A	N/A	N/A	N/A
13. Results reported in sufficient detail?	Yes	Yes	Yes	Partial	Yes	Yes	Yes	Yes	Yes	Yes
14. Conclusions supported by the result?	Yes	Yes	Yes	Partial	Partial	Yes	Partial	Yes	Yes	No
Score	18/20	15/20	16/20	9/20	15/20	18/20	16/20	17/20	18/20	17/20
Percentages	90%	75%	80%	45%	75%	90%	80%	85%	90%	85%

N/A, not available.

TABLE 2 Quality scoring (qualitative studies)

Quality assessment	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7	Question 8	Question 9	Question 10
	Objective clearly described?	Design evident and appropriate to answer study question?	Context for the study is clear?	Connection to a theoretical framework/writer body of knowledge?	Sampling strategy described, relevant and justified?	Data collection methods clearly described and systematic?	Data analysis clearly described, complete, and systematic?	Use of verification procedure(s) to establish credibility of the study?	Conclusions supported by the results?	Reflexivity of the account?
Khan and Woolhead (2013)	Yes	Yes	Yes	Yes	Partial	Yes	Partial	Partial	Yes	Partial
United Arab Emirates										
Score	16/20									
Percentage	80%									

synthesize the data from the whole range of studies (Whitemore & Krafi, 2005). The results were then presented in a narrative form (Centre for Reviews and Dissemination (CRD), 2009). This analytical process is illustrated in Table 4.

4 | RESULTS

A narrative summary of the data extracted from the individual papers is presented in Table 3. Of the 13 studies that met the inclusion criteria, two were undertaken in Iraq, four in Jordan, two in Kuwait, one in Saudi Arabia, three in the UAE, and one in Qatar. The target populations in the majority of these studies included AMW living in these countries. However, the author of one study from Iraq collected data from female physicians and nurses who worked in a maternity/pediatric hospital (Hwaid, 2013), and in another study from the UAE, data were collected from female physicians from Abu Dhabi and physicians offering women's welfare clinics in Dubai, which represent 65% of the UAE population. Cross-sectional methods were applied in all but one of the included studies, in which authors adopted a qualitative method. Sampling techniques varied, although in nine papers, the researchers used a random sampling technique (Al-Meer et al., 2011; Al Sairafi & Mohamed, 2009; Amarin et al., 2008; Bakheit & Haroon, 2004; Barghouti et al., 2008; Hwaid, 2013; Maaita & Barakat, 2002; Saadoun et al., 2014; K. H. Sait, 2009). In one study, randomized cluster sampling was used, and in three studies purposive sampling was used (Badrinath et al., 2004; Khan & Woolhead, 2015; Obeidat et al., 2012). The data for the studies were gathered from medical facilities (Al-Meer et al., 2011; Al Sairafi & Mohamed, 2009; Amarin et al., 2008; Badrinath et al., 2004; Barghouti et al., 2008; Hwaid, 2013; Obeidat et al., 2012; K. H. Sait, 2009) and educational environments (schoolteachers) (Bakheit & Haroon, 2004; Saadoun et al., 2014).

The sample sizes ranged from 13 women in the qualitative study to between 187 and 760 participants in studies based on quantitative methods; all participants were aged 17 years or over. All but two studies included Arab women, school teachers, and/or students, while two involved female physicians, nurses, and midwives who worked in gynecology clinics (Badrinath et al., 2004; Hwaid, 2013). Several determinants were found to influence cervical cancer screening practices among AMW in Western Asian and Middle Eastern Arab countries: absence of organized, systematic, population-based cervical cancer screening; lack of women's knowledge about screening; healthcare professionals' attitudes toward screening; pain and embarrassment; and cultural beliefs. The findings of the thematic analysis are presented under each theme.

4.1 | Absence of organized, systematic, population-based cervical cancer screening

Most of the included studies reported the absence of a screening program, and therefore, attendance for cervical cancer screening was mainly opportunistic. However, opportunistic screening relies on women's knowledge. El-Hammami et al. (2009) reported that women were generally inadequately informed. Approximately 42% of the women who participated in their study were told about cervical

TABLE 3 Characteristics of included studies

Author(s), year and country	Sample	Method	Study purpose	Method of analysis	Main findings	Kmet et al. score (2004) and quality issues
Al-Meer et al. (2011) Qatar	500 women at 5 randomly-selected primary healthcare centers in Qatar	Cross-sectional interview based study	To determine the knowledge, attitudes, and practice of Qatari women regarding cervical screening	Data were analyzed using SPSS, mean score for knowledge was calculated comparing demographic characteristics by Bonferroni test for multiple comparisons	Inadequate knowledge and practice of cervical screening among women <30 years and those with low educational level	Score = 16/20 = 80% Method of sample selection and source of information were appropriate and well described, but the design and the analytic methods were not justified
Al Salemi and Mohamed (2009) Kuwait	300 married Kuwaiti women randomly selected from those who visited clinics in five health regions: Capital, Hawail, Farwani, Jabra, and Ahmedi, irrespective of reasons for the visit	Cross-sectional study. A structured questionnaire was administered during face-to-face interviews with women who visited the clinics	To assess knowledge, attitudes, and practice regarding cervical cancer screening among Kuwaiti women	χ^2 test was used to assess the association between 2 qualitative variables and multiple logistic regression analysis was used to estimate the risk of different factors	Only 52.3% of women had adequate knowledge about the test Well-designed health education program on cervical cancer and benefits of screening would increase the awareness among Kuwaiti women	Score = 15/20 = 75% Study design was not clearly identified, the data-collection methods were not completely described, and some of the conclusions are unsupported by the data
Amarin et al. (2008) Jordan	Survey of 760 women attending general obstetrics and gynecology clinics in Irbid, Jordan	Questionnaire based cross-sectional study	To investigate attitudes and beliefs that affect a woman's decision to undergo cervical smear tests.	Data were analyzed using descriptive statistics (mean, standard deviation)	~95% of women in the sample had never had a cervical screening test. Major barriers to screening included inadequate knowledge	Score = 17/20 = 85% Study objectives sufficiently described, but the input variables not clearly identified
Badrnath et al. (2004) United Arab Emirates	All female physicians from Abu Dhabi and physicians offering women's welfare clinics in Dubai and 2 other smaller emirates were involved in the study	Cross-sectional survey using a self-administered questionnaire was distributed among female physicians	To assess the knowledge, attitudes, and practice of United Arab Emirates female primary care physicians regarding cervical screening To identify the physicians' training needs	Data were analyzed using χ^2 tests	Only 40% of female primary care physicians had ever performed a Pap smear, and staff were not yet ready to implement a cervical cancer screening program	Score = 9/20 = 45% Design was not completely described. Demographic information was not reported, and outcome measures were not well defined
Balhet et al. (2004) United Arab Emirates	350 female, married school teachers in Shajah city participated in the study	Cross-sectional, descriptive and analytic study based on questionnaire distribution	To determine the level of knowledge and attitude of the target population, and preparedness to undergo cervical screening To identify factors influence women's participation in the screening program	Data were analyzed using frequency distributions, cross-tabulations, χ^2 tests	Teachers had good knowledge of cervical screening, but were not commonly practicing it because of their belief that it might be painful or embarrassing No statistical relationships between age, husbands' education, marriage duration, and women's knowledge about, and attitude toward, cervical screening	Score = 15/20 = 75% Selection methods were not completely described. Description of the interview content was incomplete
Barghouti et al. (2008) Jordan	674 female patients aged >17 years and attending Family medicine clinics at Jordan University Hospital	Cross-sectional study, questionnaire based	To describe and estimate the effect of 5 sociodemographic variables and insurance status on awareness of Pap smear	Cross tabulations and Chi-squared tests were used to describe the sample and multivariate logistic regressions were performed to estimate the	1-40.3% reported having had a Pap smear, while 45% of them had a Pap smear specifically within the previous 3 years Women were less likely to be aware of cervical screening if they were older than 35 years	Score = 17/20 = 85% Study characteristics sufficiently described and appropriate sample size, but means of assessment not clearly reported

(Continues)

TABLE 3 (Continued)

Author(s), year and country	Sample	Method	Study purpose	Method of analysis	Main findings	Kmet et al. score (2004) and quality issues
El-Hamraoui, Samir, Kettaneh, Al-Fadi, and Thalib (2009)	Cluster sampling of 299 women attending gynaecology clinics in Kuwait (2009)	Descriptive, cross-sectional study using multistage cluster sampling	To estimate the influence of sociodemographic characteristics, health insurance and knowledge score on having a Pap smear test.	Factors that influence awareness of screening.		
Kuwait			To estimate the lifetime prevalence of Pap smear uptake among women in Kuwait To assess women's knowledge about, and attitudes toward, screening	Data were analyzed using descriptive statistics (% frequency) and χ^2 tests to assess the association between variables	Lifetime prevalence for cervical screening was 37%. Of those who had cervical screening, 44% had a smear once only during their lifetime	Score = 18/20 = 90% Study design appropriate and clearly identified, analytic methods distinctly described, but input variables not clearly described
Hwaiid (2013)	Sample of 198 women aged between (17–60) years divided in to two groups students and female physicians and nurses who worked in a Maternity and Children Teaching Hospital	A cross sectional study using questionnaire adopted from previous studies.	To evaluate knowledge and awareness about human papillomavirus (HPV) and cervical cancer among women	Data were analyzed using Chi-squared tests.	Inadequate levels of knowledge and awareness about (HPV), cervical cancer, and Pap smear tests.	Score = 15/20 = 75% Selection strategy was not completely described, with poorly-defined inclusion criteria. There was no information regarding estimate of variance
Musaiba and Barakat (2002)	600 women attending gynecology clinics at King Hussein Medical Centre, Amman, Jordan	Cross-sectional, descriptive study.	To assess Jordanian women's knowledge about cervical cancer screening To assess factors influencing Jordanian women's decisions to have screening	Data were analyzed using frequencies and percentages	75% of women had never had cervical screening, and 77% were not aware of causes of cervical cancer	Score = 10/20 = 50% Study design is not explicit. Target population is mentioned, but sampling strategy is unclear. Description of the interview content is incomplete. Analysis methods not well described
Obaidat et al. (2012)	187 female healthcare workers: 53 physicians, 92 nurses/midwives, 42 other	Cross-sectional study	To investigate Jordanian female healthcare workers' awareness, practice, and attitudes toward cervical cancer screening	Data were analyzed using descriptive statistics and logistic regression analysis	47.2% of participants were not aware that cervical screening was available. Healthcare professionals had negative attitudes toward screening	Score = 18/20 = 90% Appropriate study design, and objectives clearly identified, but exposure measures not distinctly described
Saadoun, Amin, and Jaboo (2014)	Sample of 222 teachers aged 20–63 years residing in Diyala city	Cross-sectional study, self-administered survey using multistage sampling technique	To assess factors influencing Pap smear practice among married primary teachers in Diyala city	Data were analyzed using descriptive statistics (e.g. frequency and % distribution) and χ^2 tests	The study showed very low rate (12.6%) of cervical screening practice among participants. Study found that only the husbands' encouragement influenced women's decision to undergo screening	Score = 18/20 = 90% Study characteristics and analytic methods clearly identified, but means of assessment not distinctly reported
K. H. Salt (2009)	600 randomly-selected women from different groups in Jeddah, Saudi Arabia	Cross-sectional study involving the distribution of 600 questionnaires to randomly-selected women	To assess the knowledge, attitudes, and practices related to cervical cancer screening and its	Data were analyzed using χ^2 tests	Only 14.8% of selected women had undergone cervical screening, and the main	Score = 16/20 = 80% Appropriate sample size and study design, but the input variable not well described

(Continues)

TABLE 3 (Continued)

Author(s), year and country	Sample	Method	Study purpose	Method of analysis	Main findings	Kmet et al. score (2004) and quality issues
Khan and Woolhead (2015) United Arab Emirates	13 women through the use of purposive and snowball sampling techniques	Qualitative study using in-depth, semi-structured interviews	To explore: Muslim women's underlying etiology and preventive measures among women living in Saudi Arabia To explore: Muslim women's perspectives toward cervical screening in Dubai To promote cervical cancer screening uptake	Thematic analysis was applied with comparative analysis between and within groups	Several factors related to cultural, religious, and sexual behaviors were found to affect educated Muslim women's perceptions of cervical cancer screening Current opportunistic approach to screening is ineffective	Score 16/20 = 80% Sample not a maximum variation sample, therefore saturation might not have been reached Researchers could have been more reflexive regarding their impact on the study

Pap, Papanicolaou smear.

screening by their physicians, and approximately 22% had never heard about it.

Furthermore, most previous studies from other Arab communities have indicated similar results. For example, a report by Sait (2009) noted that 67.6% of participants who reported that they heard about cervical cancer screening from media or doctors also stated it is predictable that targeted women participate in opportunistic screening during their attendance at healthcare facilities, because no population-based screening program has been implemented in Arab Muslim countries.

Amarin et al. (2008) found that 85.7% of women from Jordan who participated in their study had never had cervical screening. Of the 109 (14.3%) who had ever had a Pap smear, all but five had been the result of opportunistic screening. In a study designed to assess factors influencing cervical screening practices among married primary school teachers in Diyala city (Iraq), Saadoun et al. (2014) reported that medical advice was the most important reason cited by (60.7%) of participants for undergoing the test. The study found two factors that were significantly associated with cervical screening practice: encouragement by the husband ($P < .001$) and history of gynecological examination ($P = .008$). Al-Meer et al. (2011) reported that relatives and friends (21.6%) were the main sources of information about cervical screening in their Qatar study. In their UAE study, Badrinath et al. (2004) stated that more than 90% of physicians expressed a need for a cervical screening program.

4.2 | Lack of women's knowledge about screening

The findings identified a lack of knowledge with low cervical screening uptake among AMW in Western Asian and Middle Eastern Arab Muslim countries. For instance, in Iraq, Saadoun et al. (2014) found that of 222 teachers who participated in their study, only 32.4% had satisfactory knowledge about cervical cancer and screening, and only 12.6% underwent screening tests. Among those who had screening, more than two thirds (71.4%) had a smear on only one occasion, compared to 17.9% who had undergone screening twice. In another study from Iraq, Hwaid (2013) concluded that women had very limited knowledge about, and awareness of, the cervical screening test; only 57 (28.79%) of a total of 198 women in the study knew that the purpose of the Pap smear was to detect abnormal cervical cells. In their study, Khan and Woolhead (2015) found that some of the beliefs of the educated women who were interviewed were inaccurate; for instance, they considered poor hygiene (mostly through the use of public toilets) to be the cause of cervical cancer. Furthermore, those authors showed that most participants were unaware of the risks of cervical cancer and the existence of screening until it was suggested by their doctors. Of the 500 women who participated in Al-Meer et al.'s (2011) Qatar study, only 40% had had a Pap smear, although more than 85% were aware of cervical cancer, and 79% of the screening test.

In Jordan, only 50.9% of the 187 female healthcare workers participants were aware of cervical screening in Obeidat et al.'s (2012) study. Al Sairafi and Mohamed (2009) reported similar figures in Kuwait, where only 52.3% of their 300 female participants had adequate knowledge of the test. The only significant feature that was

TABLE 4 Development of themes from original data

What are the data indicating?	Studies addressing these issues (source)	Which objectives do these data relate to?	What is the relationship between what the data are indicating and the objectives (themes arising from thematic analysis)?
Poor knowledge of availability and purpose of screening Majority of women in studies had not had cervical screening Women in general were inadequately informed	Amatin, Badria, and Obeldat (2008), El-Hammari et al. (2009), Hwald (2013), Khan and Woolhead (2015), Maaita and Barakat (2002), Saadon et al. (2014) and K. H. Sait (2009)	Factors that have had an impact on the access of Western Asian Middle Eastern Arab Muslim women to cervical cancer screening services	Access to cervical cancer screening
Participants who were aware of cervical screening had obtained their information from the media or doctors			
No population-based screening program has been implemented in Arab Muslim countries			
Opportunistic screening			
Medical advice was the most important reason cited			
Belief that screening not indicated if feeling healthy Women >35 years less likely to know about screening Limited knowledge about, and awareness of, the cervical screening test	Bakheit and Heroon (2004), Maaita and Barakat (2002), Barghouti et al. (2008), Khan and Woolhead (2015), Hwald (2013), Saadon et al. (2014), Obeldat et al. (2012) and Al-Meer, Aseel, Al-Khalaf, Al-Kuwari, and Ismail (2011)	As above	Women's knowledge about screening
Some educated women were unaware of the risks of cervical cancer and existence of screening			
Level of education was the only significant factor independently associated with inadequate knowledge and attitudes toward cervical screening			
Concern about pain or embarrassment No influence of husband's age or profession on a woman's attitudes Husband's influence on whether a woman has smear test	Bakheit et al. (2004), Khan and Woolhead (2015), Maaita and Barakat (2002) and Saadon et al. (2014)	As above	Sociocultural issues
Intentions regarding cervical screening are influenced by cultural norms, such as female modesty			
Fear of cancer diagnosis as the most common perceived barrier			
Provider's negative attitudes and limited access to female doctors Main reason for not having screening was that it was not suggested by the doctor	Obeldat et al. (2012), Al-Saraf and Mohamed (2009) and Badrinath et al. (2004)	As above	Health professionals' impact on screening
Few physicians not willing to take the responsibility of the screening program			
No interventions reported		Interventions that have been implemented to increase the uptake of cervical cancer screening in Western Asian and Middle Eastern Arab countries	
No initiatives reported		Identify nursing initiatives used in the relevant countries to facilitate development of a cervical screening program	

independently associated with insufficient knowledge about cervical cancer screening was level of education.

4.3 | Health professionals' attitudes toward screening

Barriers to cervical screening involve lack of knowledge about Pap smear testing, limited access to female doctors, and negative attitudes of health professionals (Obaidat et al., 2012). Female healthcare workers' awareness, practice, and attitudes toward cervical cancer screening were studied by Obaidat et al. (2012), who reported that despite the availability of cervical cancer screening facilities, the uptake of cervical cancer screening was poor. Of the 187 female healthcare worker participants in their study, 34 (47.2%) were not aware that screening was available. In a Kuwaiti study, Al Sairafi and Mohamed (2009) identified that the main reason women did not present for screening was because they had not been referred by their doctor. In another study conducted in the UAE, Badrinath et al. (2004) designed a self-administered questionnaire to assess the knowledge, attitude, and practice of UAE female primary care physicians regarding cervical screening. Among the 98 doctors who participated in the study, only 38 (40%) reported ever having performed a Pap smear; while 42 (72.4%) were willing to take on this new responsibility, five (8.6%) were not, and 11 (19%) were undecided (Badrinath et al., 2004).

4.4 | Pain and embarrassment

In their study, Bakheit and Haroon (2004) explored individual views about, and experiences with, cervical cancer and screening strategies in the UAE. They surveyed 1638 teachers (all married female teachers in Sharjah, UAE). Of the 350 respondents from 48 schools, the majority of teachers (84%) had good knowledge of cervical screening, but did not have Pap smears themselves. In general, the most common reason for non-attendance to cervical screening was the belief that it might be painful (representing 42% of the population), whereas embarrassment was reported as the second most common reason (Bakheit & Haroon, 2004). These results were confirmed by Khan and Woolhead (2015), who reported fear and embarrassment in those who had never been screened. In another study from Jordan, Maaita and Barakat (2002) found that 22% of the 600 women who participated were embarrassed about having a cervical screening test.

4.5 | Cultural beliefs

Data on stigma and beliefs were identified in a study by Maaita and Barakat (2002), who reported that 30.2% of their 600 participants had felt healthy, and therefore, thought it unnecessary to have cervical screening. In the UAE, Bakheit and Haroon (2004) also found that 17% of their 350 participants had not had cervical screening because they felt healthy. In Kuwait, El-Hammasi et al. (2009) reported that 14% of their 299 participants reported fear of a cancer diagnosis as the most common perceived barrier. A study by Khan and Woolhead (2015) revealed that intentions regarding cervical screening are influenced by cultural norms, such as female modesty. Furthermore, they stated that Emirati women declared their preference to be

accompanied by a family member while visiting a doctor, a request based on socially-acceptable cultural practices. They also demonstrated their willingness to obtain the approval of their husbands for screening.

5 | DISCUSSION

The aim of this review was to explore factors influencing access of AMW to cervical cancer screening in Western Asian and Middle Eastern Arab countries. All included studies were conducted in similar settings in these countries, although the hospitals where recruitment took place varied on whether or not they had established population-based cervical screening programs. Our review demonstrates that, in these countries, the attendance of AMW for cervical cancer screening was mainly opportunistic; there were few intervention strategies being employed (Sait, 2009). Previous studies have demonstrated that opportunistic screening results in overscreening of women at low risk might not enable sufficient screening of women at high risk, and could be characterized by a large variance in the quality of Pap testing (Borneux et al., 2004). This is in contrast to the use of organized, population-based screening in many Western countries, whereby strategies to improve screening uptake include invitation letters, followed by recall letters and follow up, as well as phone reminders as an effective intervention strategy (Everett et al., 2011). For example, current practice in the UK and a number of developed countries involves sending invitation letters from both general practitioners (healthcare centers) and local health authorities (Everett et al., 2011).

Over three decades ago, Eardley et al. (1985), who examined the reasons behind the failure of cervical cancer prevention, established the principles for a population-based screening program. They recommended that the program should be "provider initiated and user-oriented" to ensure complete uptake by the targeted eligible women, with direct invitation to attend screening. Furthermore, a careful health-education approach is required, considering matters associated with the effectiveness and acceptability of the test, and seeking to address women's fears and anxieties within the invitation (Eardley et al., 1985). Among the 13 included studies, we found evidence to suggest that awareness of cervical cancer among AMW in Western Asian and Middle Eastern Arab countries is far behind other developed countries represented in this review.

The international findings from developed countries provide a useful background for understanding the recruitment strategies that are likely to increase the uptake of cervical testing among AMW. Most studies included in the review emphasized the need for well-designed, community-based, health-education programs to increase AMW awareness of disease prevention and treatment. The most effective public health intervention to increase screening in any nation could be targeted interventions designed to meet the needs of different socioeconomic or ethnic groups (Dunn & Tan, 2010). The provision of appropriate educational literature is important in increasing informed uptake by outlining important aspects of the screening process. The UK Government's Department of Health has produced an information leaflet emphasizing the risks and benefits of screening.

It is recommended that this is included with every invitation for screening (Everett et al., 2011).

The findings from three studies based in the UAE (Badrinath et al., 2004), Jordan (Obaidat et al., 2012), and Iraq (Hwaid, 2013) have brought to light some important findings related to healthcare professionals' awareness and attitudes toward cervical screening. These findings raised several concerns about the awareness of cervical cancer screening and its prevention among healthcare professionals. It demonstrated limited awareness on cervical screening by the use of Pap smears, in addition to negative attitudes toward such screening. In the absence of a systematic screening program, the burden is on healthcare staff to offer women opportunistic screening. The review confirms that it is desirable to train midwives and nurses to carry out screening tests for cervical screening (Sherigar, Dalal, Durd, Pujar, & Dhumale, 2010). Providing essential information through well-organized health-promotion activities and communication advocated by nursing professionals are considered to be essential in motivating awareness and reducing barriers for women to utilize cervical screening (Guwenc, Akyuz, & Yenen, 2013). Another example of this is illustrated through the developing role of general practice nurses in the delivery of cervical screening in the UK and Australia. In the UK, authorized training in cervical screening techniques is provided through Marie Curie Cancer Care, family planning courses, and through postgraduate study (Holmes, Mills, & Chamberlain-Salaun, 2014). The UK National Health Service Cervical Screening Programme requires each primary care center to have a designated individual who is responsible for implementing the national guidelines (Holmes et al., 2014). The cervical screening programme guidance refers to the crucial role of both doctors and nurses when discussing the smear test (National Health System, 2004). In their study, Holmes et al. (2014) stated that in the UK, 72–82% of Pap smears were carried out by practice nurses.

However, the transferability of Western nursing strategies to Arab Muslim countries is challenging. The cultural acceptability of routine, population-wide cervical cancer screening for AMW in Iraq has yet to be determined. As a first step, our review confirmed that there are significant socio-cultural barriers to cervical screening organization and uptake in Arab countries. Personal embarrassment and modesty seem to be strong barriers. Modesty and shyness are social characteristics expected of AMW with respect to physically visualizing personal or private information about the female body. Shyness about the body is reported, and could prevent necessary professional discussion about cervical cancer as a private or sensitive health issue. Marital relationships and family planning are considered very private issues and are less likely to be discussed with other people, especially men, including husbands (Salman, 2012). This issue must be addressed, and more research is needed to establish what strategies are culturally acceptable to AMW in Western Asian and Middle Eastern countries.

Finally, the most significant challenge noted by authors of most of the included studies was women's fear of cancer and their low participation in cervical cancer screening, which could be effectively addressed with culturally-appropriate interventions focused on increasing awareness of the disease. Many Arab people understand cancer as a fatal disease and consider it to be a death judgement.

AMW often avoid the word "cancer", and more likely identify the disease by words such as "that malignant disease" (Guimond & Salman, 2013). This supports the early sociological literature on cancer, which suggests that disease is a taboo worldwide, for as long as little is known about the cause of illness and in contexts where it is perceived to be incurable (Sontag & Broun, 1977). As global awareness of disease prevention and the prospects of cure improve, cervical cancer is becoming less stigmatized. Nonetheless, it would appear that most AMW in the studies reviewed considered cervical cancer as a fatal disease, and did not anticipate any recovery, even when detected early (Salman, 2012). Indeed, the cervical cancer statistics in Western Asian and Middle Eastern Arab Muslim countries suggest stark health inequalities. Screening is unavailable in Arab countries generally, while socio-cultural stigma relating to the disease is relevant; some literature suggests AMW consider a cervical cancer diagnosis to be a punishment from God for previous wrongdoings or as a test of their faith and patience that they have to accept (Matin & LeBaron, 2004). In most cases, it should be noted that the underlying beliefs and perceptions of health among AMW are greatly influenced by their culture and religion. Because of the importance of virginity, unmarried women are not expected to seek out gynecological health care (Matin & LeBaron, 2004). When beliefs, such as destiny and fear of cancer, are mixed with mortality, they can act as significant barriers to preventative health-seeking practices among AMW in the Middle East (Donnelly et al., 2013).

In this integrative review, we synthesized the findings of studies on cervical cancer prevention programs, which we believed would be fundamental for guidance on introducing such a program in Iraq. However, most included studies were descriptive and focused on knowledge, attitudes, and practices of AMW regarding cervical cancer and screening, with little attention to barriers related to provider perspectives or healthcare service delivery in the included countries. Moreover, the studies presented here have been characterized by noticeable disparities in the description of the methods. For instance, in E-Hammami et al.'s (2009) study, the design was clearly identified and analytic methods were distinctly described, whereas Badrinath et al.'s (2004) study did not elucidate the design well, demographic information was not reported, and outcome measures were not well defined. Furthermore, the authors of all but one study adopted a quantitative approach. Qualitative evidence can allow contextual understanding of an event because of the exploratory nature of the research (Abadir, Lang, Klein, & Abernethy, 2014). Moreover, qualitative studies on women's health issues have been used effectively with demonstrable impact on public health evidence-based practices (Khan & Woolhead, 2015).

5.1 | Strengths and limitations

Articles were restricted to those conducted in Western Asian and Middle Eastern Arab countries, and published in the period from January 2002 to January 2017. A factor that could have biased paper selection was that the search was restricted only to English-language papers, which excluded any primary research reported in other languages. Also, all of the included papers were conducted in different Arab countries, with varied cultural beliefs and healthcare systems; this could have influenced factors related to AMW access to cervical

screening. However, a strength of the review was that our findings were not restricted to one cultural context. A further limitation of this review was the methodological quality of two of the papers, where the overall scores were 50% (Maata & Barakat, 2002) and 45% (Badrinath et al., 2004), respectively. However, Whittmore and Kraff (2005) suggested that comparing scores of diverse studies might not be appropriate, and in a field where evidence is scarce, we decided to include these papers. The findings of those papers should, however, be viewed with some caution. Our integrative review revealed that 12 of the 13 quantitative studies included were cross-sectional surveys, with data analysis using descriptive statistics. However, while quantitative approaches are useful, the design might not enable attention to be focused on participants' perspectives within their own environmental contexts.

6 | CONCLUSION

Promoting cervical cancer screening uptake among AMW is an important issue to be considered by public health policy makers. Our systematic review highlighted significant health inequalities for AMW, in that no population-based cervical cancer screening programs have been implemented in most of Western Asian and Middle Eastern Arab countries. The implications for practice include the need for:

1. nursing strategies to influence policy with regard to the establishment of equitable cervical screening programs for AMW,
2. the education of healthcare professionals working in Arab countries to ensure that they understand the purpose of cervical screening, and the potential to reduce morbidity and mortality from cervical cancer using such screening,
3. the introduction of culturally-appropriate approaches to provide cervical screening for AMW, and
4. the education of AMW regarding the potential benefits of cervical screening

It should be noted that limited studies are available on cervical cancer screening among Muslim women; this indicates a need for further research. The current evidence suggests that an organized screening program might be more effective than an opportunistic approach. Future research should focus on developing culturally-sensitive innovation in cervical screening strategies to promote global population-based screening and to increase evidence-based cervical screening uptake among AMW in Arab countries.

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AUTHOR CONTRIBUTIONS

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Appendix G- A systematic review of cervical cancer screening in Western Asia and Middle East Arab countries


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 <p>Suhailah ali GICHNDM1609055</p>	<p>A systematic review of cervical cancer screening in Western Asia and Middle East Arab Countries</p> <p>Suhailah ali School of Nursing and midwifery/ Faculty of Health and Human Sciences/Plymouth University/UK</p> <p>ABSTRACT</p> <p>Population-based screening programmes have reduced mortality and morbidity from cervical cancer. The aim of this integrative review was to explore Western Asia and Middle East Arab Muslim woman's access to cervical cancer screening. A systematic search for studies conducted in Western Asia and Middle East Arab Muslim countries and published in English between January 2002 and December 2014 was undertaken. Twelve papers were selected and subjected to quality appraisal. A three step analysis involved: narrative summary of quantitative evidence, thematic analysis of qualitative data and integration of the result for presentation in narrative form. Few population-based cervical cancer screening programs had been implemented in Western Asia and Middle East Arab countries, with low levels of awareness and uptake of cervical screening among Arab Muslim women. Factors influencing cervical cancer screening practices were: absence of organized systematic programmes, low screening knowledge amongst women, health care professionals' attitude towards screening, pain and embarrassment, stigma and sociocultural beliefs. Policy changes are urgently needed to promote population-based screening programmes. Future research should focus on developing culturally sensitive strategies to increase cervical screening uptake among Arab Muslim women and improve early detection of cervical cancer.</p> <p>Key words: Arab Muslim countries; cervical cancer; cervical screening; barriers to screening; Papanicolou test; smear test.</p>
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Appendix H- Poster presentation at the Annual Research Student Conference, Plymouth University Peninsula Schools of Medicine and Dentistry and School of Biomedical and Healthcare Science Research Students [October 2014]




Barriers to Cervical Cancer Screening In Iraq



A project of A PhD study in Maternal and Child Health Nursing
Suhailah M. Ali


Introduction

- Cervical cancer is a disease in which malignant cells form in the tissues of the cervix.
- 2nd most common cancer among women globally.
- Developed countries implemented sophisticated cervical cancer detection programs based on Papanicolaou (Pap) testing in 1970
- 75% decrease incidence mortality in developed world.
- Higher cervical cancer mortality in developing countries due to lack of effective screening programs (WHO, 2010)



Aims of the study


- To explore barriers to cervical screening among married women
- Develop Evidence - informed recommendations for population based cervical screening programme for Kirkuk Health Directorate



Barriers to Cervical Cancer Screening in Iraq


Poorly developed healthcare services		Women are uninformed and disempowered
The nature of the screening test		Emotional and practical barriers

Methodology

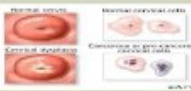


Tools for data collection :-

- A questionnaire interview form was developed to collect information from mothers about barriers. Questions assessed self-reported cervical screening attendance.
- Ethical approval obtained from Kirkuk Health Directorate.



A qualitative pilot study has been conducted. 25 women aged between 18-65 years have been interviewed.



The Gynaecologists working in the cervical cancer screening units were also interviewed to identify the barriers healthcare professionals face for establishing a successful cervical cancer screening.

Preliminary Results

- Successfully organised, population-based cervical cancer screening programmes have not yet been implemented.
- stigma about cancer present a significant challenges to cervical screening, yet discussing it remains 'taboo' and one of the biggest issues preventing women from seeking treatment or even knowing about the disease.
- Recommendation from Research Committee in Kirkuk Health Directorate to develop a screening programme.

Appendix I- Study intervention (education training programme for gynaecologists and nurses) presentation at Azadi teaching hospital, Kirkuk, Iraq [July 2016]

<p>INTRODUCTION TO THE CERVICAL SCREENING PROGRAMME</p> <ol style="list-style-type: none">1. Cervical cancer2. Background3. History of cervical Screening4. Cervical cancer screening modernisation <p>Important screening issues</p>	<p>Cervical cancer</p> <ul style="list-style-type: none">○ Cervical cancer is a type of cancer that occurs in the cells of the cervix — the lower part of the uterus that connects to the vagina. Various strains of the human papillomavirus (HPV), a sexually transmitted infection, play a role in causing most cervical cancer
<p>BACKGROUND</p> <ul style="list-style-type: none">○ Worldwide, 2nd common female cancer after breast cancer. The majority of cases occur in developing countries○ Cervical cancer ranks as the 12th In Iraq and the 10th most frequent cancer among women between 15 and 44 years of age.○ It is predicted that by 2030, cervical cancer will be responsible for the death of 4,74000 women annually with over 95% of these death expected to take place in low-and middle income countries○ 66% of women diagnosed with cervical cancer survive more than 5 years.	<p>BACKGROUND</p> <ul style="list-style-type: none">○ The Papanicolaou (Pap) smear is a screening test of asymptomatic women used world-wide to detect treatable preinvasive squamous abnormalities of the cervix. Enabling effective reduction of the incidence of the cervical cancer by 75- 90%○ The aim of regular cervical screening is to detect abnormal cells in the cervix to facilitate early treatment○ Cervical cancer screening rates are very low in Middle Eastern Arab Muslim countries

- Both incidence and mortality of cervical cancer cases have sharply decreased in developed countries following the introduction of well-run screening programmes
- According to a report of the UK National Health Screening published on the 29th October 2015 up to 5,000 deaths per year are prevented by cervical screening

RISK FACTORS FOR CERVICAL CANCER

- > Viral infection-particularly HPV16,18,31,33
 - a. -Genital HPV is generally transmitted
 - b. -HPV is rarely detected in women with no previous sexual activity
 - > Smoking

Women who smoke are about twice as likely as non-smokers to get cervical cancer
 - > Immunosuppression
 - a. Medical conditions(HIV, immunosuppressive drugs)
- Non attendance for cervical screening.

Taken from the introductory training course on cervical cancer screening at Birmingham City University

DEVELOPMENT OF CERVICAL CANCER

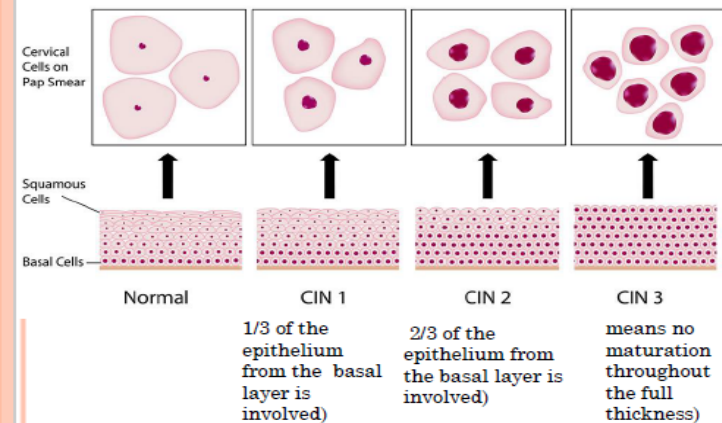
- Usually progressive
- Screening test identifies possible dyskaryosis (abnormal nucleus)

Aim of screening to treat here

CIN1	CIN2	CIN3	Cervical Cancer
Low grade means 1/3 of the epithelium from the basal layer is involved).	High grade (moderate) (means 2/3 of the epithelium from the basal layer is involved).	High grade (severe) (means no maturation throughout the full thickness).	? Cancer

Taken from the introductory training course on cervical cancer screening at Birmingham City University

Cervical Intraepithelial Neoplasia (CIN)



Taken from the introductory training course on cervical cancer screening at Birmingham City University

DEVELOPMENT OF CERVICAL CANCER

- At least 35% of patients with CIN III develop invasive cancer within 10 years, whereas lower grades of CIN often spontaneously regress
- Majority of invasive lesions are squamous cell carcinomas. Adenocarcinoma rare

WHAT IS CERVICAL SCREENING

- Invitation to women at risk of disease for screening to identify those who have indications of asymptomatic cervical abnormalities which require further investigation to avoid the possibility of developing into cervical cancer
- In other words.....**RISK REDUCTION**
Cervical screening is not a test for cancer. It is a method of preventing cancer by detecting and treating early abnormalities which, if left untreated, could lead to cancer.

Taken from the introductory training course on cervical cancer screening at Birmingham City University

HISTORY OF CERVICAL SCREENING

- Cervical screening was introduced in England in 1964
- 1988 computerised call and recall system was put in place
- 1995 data was published demonstrating that cervical screening reduces the incidence of mortality of cervical cancer
- 1996 guidelines were published for the Quality Assurance(QA), Reporting guidelines and Colposcopy management were introduced

Taken from the introductory training course on cervical cancer screening at Birmingham City University

HISTORY OF CERVICAL SCREENING

- 2000 piloting (a plan, project, etc.) before introducing it more widely. of Liquid Based Cytology(LBC) and Human papilloma virus (HPV) triage begin (The test is used when a woman has a cervical screening result of borderline or low grade squamous dyskaryosis. The HPV test is important because it allows earlier identification of women who need treatment)
- 2003 the screening programme switched to LBC, standardises the frequency of screening and increases age of first invitation from 20 to 24.5(In England)
- 2007 Cancer Reform strategy announces that all women will receive the results of their cervical screening test within two weeks by 2010

Taken from the introductory training course on cervical cancer screening at Birmingham City University

LIQUID-BASED CYTOLOGY & CONVENTIONAL CYTOLOGY

Conventional Pap smear

A spatula or brush is used to collect cells on the ectocervix and then from the endocervix. The specimen is rolled on to a slide and rapidly fixed



Taken from the introductory training course on cervical cancer screening at Birmingham City University

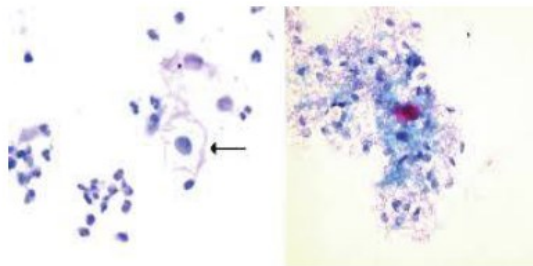
LIQUID-BASED CYTOLOGY

- Involve taking cells from the ectocervix and endocervix and placing the specimen in vials containing preservative solutions. The vials are placed in a Thin processor machine and ultimately, the cells are transferred to a slide. This technique results in a monolayer of cells on the slide which can be read more quickly than conventional cytology slides



Taken from the introductory training course on cervical cancer screening at Birmingham City University

COMPARISON OF CONVENTIONAL AND LIQUID-BASED CYTOLOGY

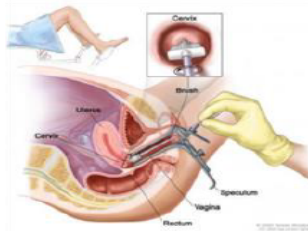


Taken from the introductory training course on cervical cancer screening at Birmingham City University

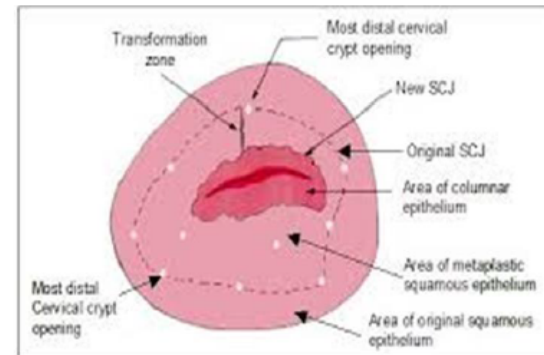


OBTAINING THE SAMPLE

- Ensure that patient is as comfortable as she can be in the lithotomy position
- Insert the speculum, ensure a small amount of lubricant is on this but not on the tip as this can impair the sample



Taken from the introductory training course on cervical cancer screening at Birmingham City University



- Visualize the whole cervix (you need to see the whole of the transformation zone TZ)
- Transformation zone is where the endocervical epithelium has been converted to squamous epithelium by a process called metaplasia. This is the area which needs to be fully sampled with your cervix brush

Taken from the introductory training course on cervical cancer screening at Birmingham City University

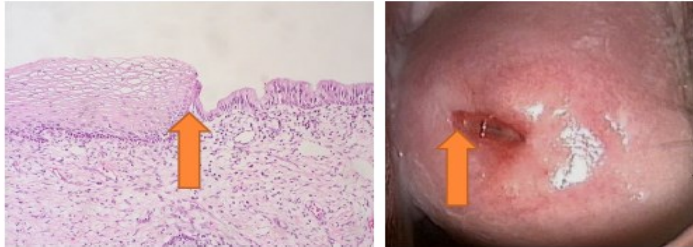
OBTAINING THE SAMPLE

- Using "Broom" Cervix brush insert the longer bristles into the cervical os, then begin to turn this in a clockwise direction
- Push towards the cervix whilst still rotating, the lateral bristles will spread out onto the ectocervix whilst the central bristles will obtain the glandular cells within the endocervical canal
- Ensure you completes 5 full rotations before removing the brush to then place in the pot
- Place the brush into the pot pushing the bristles to the bottom of the vial forcing them apart, do this 10 times
- If a cytobrush is needed insert into endocervical canal and rotate 90 degrees and place brush in same sample pot and swirl to remove cells

You may then discard the brushes place the lid on to specimen and ensure documentation is complete and send the sample.

Taken from the introductory training course on cervical cancer screening at Birmingham City University

OBTAINING THE SAMPLE



The squamocolumnar junction: marks the boundary between the squamous-lined ectocervix and the columnar-lined endocervix (arrows)

Taken from the introductory training course on cervical cancer screening at Birmingham City University

ELEMENTS TO ENSURE EFFECTIVENESS OF CERVICAL CANCER SCREENING

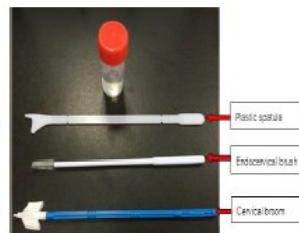
- Identification and invitation of eligible women at appropriate screening intervals
- Eligible women are those aged between 25 and 64 who have a cervix
- Aim to achieve at least 80% coverage of eligible women
- Information for women to help them make an informed choice about whether or not to come for cervical screening

A team approach to ensure continuity of care for the women.

Taken from the introductory training course on cervical cancer screening at Birmingham City University

TAKING THE SMEAR

- **CERVIX BRUSH:** Rotate 5 times 360 degree (to ensure a good endocervical component) in clockwise direction only
- **CYTO BRUSH:** Rotate 90 degrees once positioned in the cervical os to achieve endocervical sample-only in addition to cervix brush and same LBC vial for processing.



Taken from the introductory training course on cervical cancer screening at Birmingham City University

LIMITATION OF CERVICAL SCREENING

- Cervical screening can detect minor abnormalities in cervical cells which would have cleared up on their own without women ever knowing about them
- Cervical screening does not pick up every abnormality of the cervix
- Regular screening prevent 75% of cervical cancer developing but does not prevent every case.

Taken from the introductory training course on cervical cancer screening at Birmingham City University

CERVICAL SCREENING ACTIVITIES

- > Call and recall services
- Send prior notification list to practice
- Invite women 6 weeks prior to test due date with appropriate leaflet
- Reminder letter sent to patient 15 weeks after invitation letter
- Non-Responder cards
- Back to Recall

- > GPs, practice nurse
- Sample taking, provide information
- > Laboratories
- Sample & biopsy interpretation
- > Colposcopy/gynaecology
- Further investigation/treatment

Taken from the introductory training course on cervical cancer screening at Birmingham City University

RECOMMENDED ROUTINE SCREENING INTERVALS

Age group (years)	Frequency of screening
25	First invitation
25-49	3 year
50-64	5 years
65+	Only screen those whose last three tests included an abnormal result, or women who have never been screened and request a test

Taken from the introductory training course on cervical cancer screening at Birmingham City University

CEASING FROM PROGRAMME

- Cease due to
- o Absence of cervix
 - o Age
- Radiotherapy for cervical cancer

In preparation for the pap test, for 48 hours before the exam avoid

- o Vaginal medication
- o Vaginal contraceptives
- o Douches

Taken from the introductory training course on cervical cancer screening at Birmingham City University

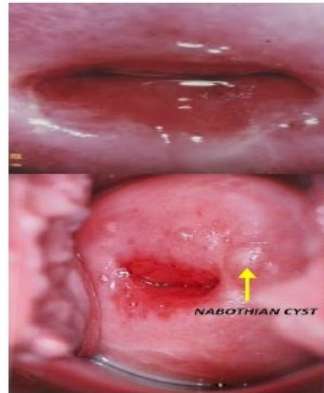
COLPOSCOPY

- o The colposcopy is the outpatient examination of the magnified cervix using a light source. It is used for both diagnosis and treatment.



THE BASIC PRINCIPLE OF PERFORMING A COLPOSCOPY

- Is there an abnormality
- Is there any HPV present?
- Is this pre-invasive disease?
- Is this cancer?



Taken from the introductory training course on cervical cancer screening at Birmingham City University

CIN1

- Observation for selected patients(low risk ,age <35)
- All immunocompromised patients should be treated
- If HPV testing available, positive result for High RISK HPV is an indication for treatment
- Observation : Repeat Pap smear +colposcopy in 6 months , treat if persist after 12 months
- All CIN2,CIN3 Cases should be treated

Taken from the introductory training course on cervical cancer screening at Birmingham City University

FOLLOW UP AFTER TREATMENT FOR CIN1

- Repeat smear in 6 months
- Repeat smear and colposcopy in 12 months
- If normal, yearly pap smear for 2 years then back to normal routine smear

Taken from the introductory training course on cervical cancer screening at Birmingham City University

CERVICAL ECTROPION (CERVICAL EROSION)

- Cervical ectropion (also known as cervical erosion and ectopy) is a common condition caused when cells from inside the cervical canal, known as glandular cells (soft cells), are present on the outside surface of the cervix.



Taken from the introductory training course on cervical cancer screening at Birmingham City University

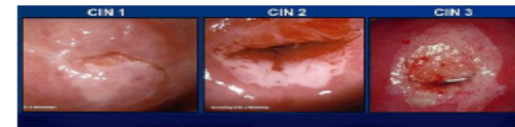
CERVICAL ECTROPION (CERVICAL EROSION)

- Cervical ectropion can be caused by hormonal changes, pregnancy and being on the pill.
- It is not linked to the development of cervical cancer or any other condition that causes cancer.

Taken from the introductory training course on cervical cancer screening at Birmingham City University

CERVICAL INTRAEPITHELIAL NEOPLASIA

- Cervical Intraepithelial Neoplasia (CIN) are cellular changes to the ectocervix
- Glandular Cervical intraepithelial Neoplasia(GNN) are changes to the cells within the endocervical cells



Taken from the introductory training course on cervical cancer screening at Birmingham City University

CERVICAL INTRAEPITHELIAL NEOPLASIA

- Persistence of the HR HPV Virus can cause CIN to develop
- Within colposcopy the cervix is examined to identify if we can see any pre cancerous abnormalities which histologically is confirmed as CIN.

HPV VACCINATION PROGRAMME

- Lunched 2008 in UK – bivalent (HPV 16&18)
- September 2012 switched to quadrivalent (HPV6,11,16,18)
- 12-13 year olds with phased catch up for 13-18 year olds
- HPV vaccines should be administered in a 3-dose schedule, with the second dose administered 1 to 2 months after the first dose and the third dose 6 months after the first dose.

Taken from the introductory training course on cervical cancer screening at Birmingham City University

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Thank You

**Appendix J- Invited presentation to the International Women’s day
2018. Plymouth University/ Peninsula Schools of Medicine and
Dentistry**

International Women’s Day 2018

Thursday March 8th

(Event scheduled for late morning-afternoon)

Speakers and Presentations:

Speaker (confirmed so far)	
Alice Inman (PUPSMMD)	Host/Compere
Sonam Zamir (School of Psychology)	Using video calls to prevent loneliness in care homes
Jo Erwin (PUPSMMD)	Kenya self-management project
Janet Richardson (School of Nursing and Midwifery)	Global Health and Climate Change Challenges for Women
Clare Pettinger (School of Health Professions)	Food as a lifestyle motivator
Avril Bellinger (School of Health Professions) Chair of Students and Refugees Together (START)	START as a contribution to women’s global health
Suhailah Ali (PUPSMMD)	Pap smear promotion among women in Iraq

Presentations will be 5-10 minutes and there will be a poster display of work/research.

Venue:

Rolle Marquee

(Devonport LT (PSQ) and Arita A booked as back up)

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