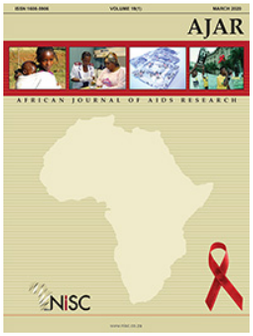

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Research Article

Intervention targets for people living with HIV and depressive symptoms in Botswana

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Background: **The prevalence of HIV in Botswana is high. Many people living with HIV (PLWH) suffer from depressive symptoms and have inadequate coping skills. Most PLWH do not receive adequate psychological treatment. Empirically based interventions for PLWH with depressive symptoms in Botswana should be developed, with a focus on improving coping skills. The present study was a first step towards this goal, by trying to identify targets for intervention. The study aimed to provide prevalence rates of depression among PLWH in Botswana, to assess their mental health treatment needs and wishes as expressed by themselves, and to study the relationships between cognitive and behavioural coping strategies and depressive symptoms.**
Method: **A cross-sectional study was conducted. The sample consisted of 291 participants (73% female) from 8 HIV treatment centres from Botswana. Participants completed standardized questionnaires on depressive symptoms (CES-D) and coping skills (CERQ, BERQ). They also answered questions regarding their mental health care needs and wishes.**
Results: **In total 43.4% of participants reported clinically significant depressive symptoms. The majority of participants indicated that they needed help with the following topics: feelings of depression, physical tension, finding new goals and coping with HIV. In addition, they indicated preferring a self-help programme in booklet format. Multiple regression analyses showed that the following coping strategies had significant relationships with depressive symptoms: rumination, catastrophising, withdrawal, positive refocusing and refocus on planning (the latter two negatively).**
Conclusion: **Almost half of the PLWH reported depressive symptoms that were clinically significant. The findings suggested that an intervention for PLWH with depressive symptoms in Botswana should preferably be a self-help programme presented in booklet format. With regard to content, the results confirmed that the intervention should focus on specific coping skills. In addition, elements like goal finding and strategies to reduce physical tension should be added.**

Keywords: Africa, coping skills, depression, goal finding

Introduction

Botswana's HIV prevalence rate ranks at the higher end globally (UNAIDS, 2017). Although Botswana has made enormous progress in providing free antiretroviral therapy (ART) to people living with HIV (PLWH), the mental health consequences of living with the disease have not been adequately addressed yet (Lewis, Mosepele, Seloilwe & Lawler, 2012).

From studies in countries other than Botswana we know that PLWH face many psychological challenges that may complicate their illness, such as depression and anxiety (Kaneez, 2016; Sikkema, Dennis, Watt, Choi, Yemeke, & Joska, 2015). Studies in sub-Saharan African countries increasingly point to depression as the leading mental illness among PLWH (Breuer, Myer, Struthers & Joska, 2011; Nel & Kagee, 2013; Abas, Ali, Nakimuli-Mpungu & Chibanda, 2014). Conclusive figures for the prevalence of depression of PLWH living in sub-Saharan Africa cannot yet be given, because they vary widely across studies. For example, a systematic review and meta-analysis on PLWH living in sub-Saharan Africa, which includes the results of 66 previous papers, reported pooled prevalence rates of depressive disorder that ranged between 9% and 32%, depending on the measurement instrument and whether or not they were on ART (Bernard, Dabis & Rekeneire, 2017). Concerning gender differences, it has been found that females were more likely to report depressive symptoms than men in this region (Nyirenda, Chatterji, Rochat, Mutevedzi & Newell, 2013; Seth et al., 2014). Only one study specifically reported on the prevalence rates of depression among PLWH in Botswana. Lawler and colleagues (2011) used two separate instruments

to investigate the incidence of depression among PLWH in Botswana. Depending on the instrument, they found that 24% (Beck Depression Inventory-Fast Screen) and 38% (Prime Mental Disorders Mood Moodle) of the participants fulfilled the criteria for depressive disorder, with women reporting higher mean depressive symptom scores than men.

In conclusion, thus far hardly any attention has been paid to the prevalence of depressive symptoms in PLWH in Botswana, let alone for their mental health treatment needs. Some reasons for the limited attention to mental health of PLWH in Botswana include lack of a clearly defined mental health system, lack of specific diagnostic tools and lack of specific treatment programmes for the mental health problems in the HIV population (Lewis et al., 2012). Nevertheless, the figures mentioned earlier suggest that depression might be an important obstacle for PLWH in Botswana. Therefore, as a first aim, the present study will investigate the prevalence rate of clinically significant depressive symptoms of PLWH in Botswana.

From other countries we already know that depression among PLWH can be an important predictor of treatment failure, poor quality of life, disease progression and at worst mortality (Marwick & Kaaya, 2010; Breuer et al., 2011; Lewis et al., 2012; Abas et al., 2014; Sikkema et al., 2015). Treatment of depression among PLWH in Botswana is therefore important, given these potential consequences for health and well-being. A search for systematically integrated treatment programmes for depression or other mental health issues for PLWH in Botswana did not reveal any results. Looking at other countries in sub-Saharan Africa, only two examples of specific intervention programmes for PLWH were found. First, Nakimuli-Mpungu and colleagues (2015) in Uganda and Petersen, Hanass Hancock, Bhana and Govender (2014) in South Africa found that an eight-week group-based intervention for PLWH was effective in reducing depressive symptoms. Second, in Tanzania, Kaaya and colleagues (2013) found that a six-week intervention programme helped to reduce depressive symptoms among PLWH in the intervention group compared with participants in the control group. Both programmes were delivered in groups, made use of cognitive behaviour therapy techniques, focused on coping and stress/problem management, behavioural activation techniques and skills training, and used support groups to improve mental health outcomes (Kaaya et al., 2013; Petersen et al., 2014; Nakimuli-Mpungu et al., 2015). Moreover, these interventions were delivered by lay counsellors (Petersen et al., 2014) and community health workers (Sikkema et al., 2015).

If we look at Western countries, more examples of effective intervention programmes for PLWH with depressive symptoms can be found (Olatunji, Mimiaga, O'Cleirigh, & Safren, 2006; Brown & Vanable, 2008; Carrico & Antoni, 2008; Crepaz et al., 2008; Scott-Sheldon, Kalichman, Carey & Fielder, 2008; Kraaij et al., 2010; Sherr, Clucas, Harding, Sibley & Catalan, 2011; van Luenen, Garnefski, Spinhoven, & Kraaij, 2018). Most of these programmes employed techniques from the cognitive-behavioural approach, consisted of multiple sessions and were delivered face to face individually or in small groups. They generally focused on the reduction of stress and the facilitation of adaptive coping skills (including changing of maladaptive cognitions and behaviours) (Brown & Vanable, 2008; Molassiotis et al., 2002).

Given the lack of psychological intervention programmes for PLWH in Botswana, it is crucial to gain knowledge on what kind of programme would match the problems and needs of PLWH and depression in Botswana. Therefore, the second aim was to assess the treatment needs and wishes of PLWH in Botswana, as expressed by themselves. No information could be found on this topic in the literature.

Previous studies clearly showed that depressive symptoms among PLWH are often significantly related to maladaptive coping skills (Abas et al., 2014; Gore-Felton et al., 2006; Kaneez, 2016). As a consequence, coping skills have generally been included as an important target in previous psychological interventions for PLWH (e.g. Kraaij et al., 2010; van Luenen et al., 2018). The third aim of the present study was to examine which specific coping strategies are related to depressive symptoms in PLWH in Botswana. This will provide information that can help to shape the content of possible interventions.

Coping is generally defined as the conscious cognitive or behavioural strategies employed by individuals when responding to stress (Lazarus & Folkman, 1984). Cognitive coping strategies that have been distinguished in the literature are blaming oneself, rumination, catastrophising, blaming others, acceptance, planning, positive reappraisal, positive refocusing, and putting into perspective (Garnefski & Kraaij, 2007). With regard to PLWH, research evidence has shown that 'maladaptive' cognitive strategies such as self-blame, rumination and catastrophising were associated with higher levels of depressive symptoms in PLWH in the Netherlands (van der Veek, Kraaij, van Koppen, Garnefski, & Joekes, 2007; Kraaij et al., 2008). In contrast, 'adaptive' strategies such as positive refocusing, positive reappraisal and putting into perspective were associated with lower levels of depression in PLWH (Kraaij et al., 2008).

Behavioural coping strategies that have been distinguished in the literature are: seeking distraction, actively approaching, seeking social support, withdrawal and ignoring (Kraaij & Garnefski, 2019). With regard to PLWH, previous research has shown that especially active and problem-focused coping were associated with lower levels of depressive symptoms (Kraaij et al., 2008; Kotzé, Visser, Makin, Sikkema, & Forsyth, 2013).

In summary, the present study had three main aims. First, the study aimed to provide new figures on the prevalence of clinically significant depressive symptoms among male and female PLWH in Botswana. Based on previous research, we hypothesised that between 24% and 38% of the participants would obtain scores that are indicative of clinically significant depressive symptoms, with females showing higher rates. Second, the study aimed to assess the treatment needs and wishes of PLWH in Botswana, as expressed by themselves. No hypotheses could be formulated here due to the novelty of the question. Third, the study aimed to investigate the relationships between specific cognitive and behavioural coping strategies and depressive symptoms among PLWH in Botswana, in order to find specific intervention targets. Based on previous research, we expected that coping strategies such as rumination, catastrophising and self-blame would be positively related to depressive

symptoms among PLWH in Botswana whilst adaptive coping strategies, such as positive refocusing, putting into perspective, refocus on planning and active coping, would be negatively related to depression.

Methods

Sample and procedures

A total of 306 PLWH were recruited from eight HIV treatment centres around Botswana (Princess Marina Hospital's Infectious Disease Control Centre (IDCC); Selibe-Phikwe Government Hospital; Botshabelo (IDCC); Kagiso IDCC; Tapologong clinic; Nyangabwe Referral Hospital (IDCC); Kasane Primary Hospital (IDCC); and Plateau clinic). These research sites were selected strategically, because together they serve some of the highest HIV-prevalent areas in the country (Statistics Botswana, 2017) and thereby provide a fairly representative sample of the HIV population in this country.

The inclusion criteria were PLWH aged 18 years and over and having sufficient knowledge of Setswana and/or the English language. At the treatment sites, participants were selected through the use of convenience sampling. During morning prayers, the nursing staff briefly explained the study to the participants and invited potential participants to take part in the study. It was explained that participation was anonymous and voluntary and that those who volunteered could withdraw at any point without consequences. Potential participants volunteering to participate in the study were then given more information about the study and asked to sign a consent form. Participants then completed a questionnaire in Setswana or English while waiting for their appointment or after their appointment with the doctors. During visits, patients are expected to wait in a queue before being attended to by a medical practitioner. To maintain privacy during data collection, a room was prepared for the participants at the hospital where they completed their questionnaire. Some participants, however, preferred to complete their questionnaire while queuing. Furthermore, participants who could not read or write were offered help with completing the questionnaire. To ensure that participants did not miss their turn while completing a questionnaire, the research team monitored the queue. Participants who were interested in participating but were unable to complete the questionnaire at the hospital were given contact details of the research team in order to make arrangements for them to complete the questionnaire at a different time. Four participants expressed interest, and an appointment was set for them to complete the questionnaire at the clinic/hospital the next day. However, none of them returned. The questionnaire took about 50 minutes to complete.

Measures

Demographic and clinical characteristics

Data were collected on demographic characteristics and clinical characteristics including personal information, information regarding HIV infection, medication adherence and HIV disclosure. Some of the data on information regarding HIV infection such as CD4 count and viral load were self-reported while some were collected from medical reports with participants' consent. Further, participants were asked to rate their psychological and physical health on a scale from 0 (very bad) to 10 (very good).

Needs assessment and assessment of intervention delivery mode

A needs assessment questionnaire was developed to assess the needs of PLWH in Botswana. Participants were asked to indicate for a number of areas whether they would (maybe) like to receive help or not (feelings of anxiety, feelings of sadness, physical tension, finding new goals in life, finding people to give support, finding or keeping work, coping with HIV, worrying). Also, participants were asked to indicate the preferred mode of intervention, the desired programme format and the preferred way of accessing HIV-related information.

Depressive symptoms

Depressive symptoms were measured using the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). The 20-item scale was developed for adults and adolescents to help identify depressive symptoms. The scale is a self-report measure with responses based on the frequency of occurrence of symptoms during the past week. It uses a four-point Likert scale (ranging from 0 = rarely/none of the time to 3 = most/all the time) and can be completed in 5–10 minutes. The possible range of scores for the scale is 0–60. The total score was attained by adding the scores of all items on the scale. The scoring for positive items (4, 8, 12 and 16) was reversed. We used the official cut-off score of 16 or higher to indicate the presence of clinically significant depressive symptoms. The scale has been reported to be a valid measure of depressive symptomatology in various populations (Radloff, 1991; Simoni et al., 2011; Vilagut, Forero, Barbaglia & Alonso, 2016; Baron, Davies & Lund, 2017). In the present study, the CES-D had an α reliability of 0.86 (Table 1).

Cognitive coping strategies

The 36-item Cognitive Emotion Regulation Questionnaire (CERQ) was used to measure cognitive coping strategies used by PLWH. The questionnaire has nine subscales, each including four items (self-blame, other-blame, rumination, catastrophising, putting into perspective, positive refocusing, positive reappraisal, acceptance, and refocus on planning) (Garnefski, Kraaij, & Spinhoven, 2001, 2002). The items were measured on a five-point Likert scale, ranging from 1 (almost never) to 5 (almost always). The subscales were scored by adding the scores on the four items of each subscale. Each subscale had a minimum score of 4 and a maximum of 20. All subscales of the CERQ have been found to have good internal reliability with alpha ranging from 0.75 to 0.87 (Garnefski & Kraaij, 2007). The CERQ subscales have been found to have good internal reliability when used in different populations (e.g. Jermann, van der Linden, d'Acremont & Zermatten, 2006; Abdi, Taban & Ghaemian, 2012). In the current study, the alphas ranged from 0.70 to 0.79 (Table 1).

Behavioural coping

Behavioural coping strategies in this study were measured using the Behavioral Emotion Regulation Questionnaire

Table 1: Means, standard deviation, ranges and reliabilities of study variables

	Mean (SD)	Observed range	Cronbach's alpha	*n*
Depressive symptoms	15.37 (10.50)	0–53	0.86	242
Self-blame	10.04 (4.48)	4–20	0.74	233
Acceptance	15.22 (4.90)	4–20	0.77	233
Rumination	10.24 (4.76)	4–20	0.70	233
Positive refocusing	13.46 (5.31)	4–20	0.79	232
Refocus on planning	14.53 (5.08)	4–20	0.78	233
Positive reappraisal	14.50 (4.67)	4–20	0.72	232
Putting into perspective	11.78 (4.95)	4–20	0.71	233
Catastrophising	8.39 (4.76)	4–20	0.79	233
Blaming others	7.80 (4.40)	4–20	0.78	233
Seeking distraction	12.01 (5.04)	4–20	0.76	231
Withdrawal	7.35 (4.23)	4–20	0.73	231
Actively approaching	13.72 (5.30)	4–20	0.84	231
Seeking social support	13.55 (4.68)	4–20	0.82	231
Ignoring	11.46 (5.52)	4–20	0.80	231

(BERQ) (Kraaij & Garnefski, 2019). The questionnaire was used to measure behaviours that PLWH use in order to cope with having HIV and consists of five subscales (seeking distraction, actively approaching, seeking social support, withdrawal, and ignoring). Each subscale consisted of four items that were measured on a five-point Likert scale ranging from 1 (almost never) to 5 (almost always). The subscales were scored by adding the scores on the four items of each subscale. Each subscale had a minimum score of 4 and a maximum of 20. All subscales of the BERQ have been found to have good internal reliability with alpha ranging from 0.86 to 0.93 (Kraaij & Garnefski, 2019). In the present study, the alphas ranged between 0.71 and 0.84 (Table 1).

Data analyses and statistics

Statistical analysis was performed using the Statistical Package for Social Sciences software (SPSS) version 24 (IBM Corp, Armonk, NY. USA). First, box plots were made to identify outliers in the data and to examine the shape of the distributions. To describe sample characteristics regarding personal information and HIV-related information, descriptive statistics were used (mean scores, standard deviations, and range). The prevalence rate of clinically significant depressive symptoms was obtained by descriptive analyses (percentage). A cut-off score of 16 or higher on the CES-D (see measures) was used to classify a participant as having clinically significant depressive symptoms. In addition, mean depressive symptom scores and standard deviations were provided. Prevalence rates of self-reported mental health treatment needs and wishes were also obtained by descriptive analyses (percentages). To examine bivariate relationships between coping strategies and total depressive symptoms scores, Pearson correlations were calculated. To examine multivariate relationships between cognitive and behavioural coping strategies and total depressive symptom scores, three multiple regression analyses (MRAs) were performed. In the first MRA, depressive symptoms were regressed on the nine cognitive coping variables. In the second MRA, depressive symptoms were regressed on the five behavioural coping variables. In the third MRA, depressive symptoms were regressed on a combination of cognitive and behavioural strategies. In the latter analysis, only the significant coping strategies from the first two MRAs were included, as the sample size was too small to include all strategies at the same time. To control for the influence of some demographic variables, age, gender and physical health as rated by the participant were entered in the first step (method enter).

Results

Preliminary analyses

Each variable was screened for missing data, normality and outliers, and scales were tested for reliability. Missing values were screened using the option 'frequencies' in SPSS, and a small number of missing values were identified. To deal with the problem of the missing values, individual mean scores for the scales/subscales were calculated based on the available data and used to replace the missing values (Field, 2009). This was only done when not more than a quarter of the items in a (sub)scale were missing for each score. Outliers were identified through box plots and stem and leaf diagrams generated in SPSS. After careful inspection, 15 cases were deleted from the dataset as it was noted that responses from these 15 cases seemed unreliable, where the same score was given to all items in the questionnaire including reversed items. The data were screened for normality using measures of skewness and histograms. Overall skewness was insignificant in terms of compromising subsequent analysis. The inspection of histograms also did not indicate the need for any adjustment.

Sample description

A total of 306 PLWH completed the questionnaire for the present study. After removing 15 cases due to the unreliable nature of the responses, data from 291 respondents were analysed. Females made up 73.0% of the sample. The mean age of the respondents was 39.7 years (SD 9.4; range 19–74 years). Almost all (98.0%) of the participants were Batswana. The majority (53.7%) reported never having been married, 24.0% were married, 15.3% were cohabiting, 2.8% were divorced and 3.5% were widowed. The proportion of participants who indicated that they had children was 86.1%. In total, 46% of the participants indicated that their partners were also living with HIV. More than half (60.2%) thought

they were infected with HIV through having unprotected sexual intercourse. The majority (92.0%) of the respondents were on HAART. A high proportion (92.1%) reported being satisfied with HIV treatment. Participants were prescribed between one and eight pills per day and 72.6% indicated that they took their medication 100% of the time. A history of tuberculosis was reported by 15.6% of the respondents. Other infections experienced due to HIV included herpes (4.4%), pneumonia (2.9%), cancer (4.8%), meningitis (2.9%) and fungal infection (4.4%).

About half (52.8%) of the participants lived in a town, 31.1% in a village and 16.1% in a city. In terms of educational background, 21.7% of the participants had primary education, 42.3% junior school education, 17.5% senior school education, 15.4% had college or university education, and 3.1% had no schooling. About half (52.3%) of the participants had a full-time job, 10.3% a part-time job and 37.4% were unemployed.

A history of depression was reported by 18.5% of the participants. Of those with a history of depression, 9.2% indicated that they had received treatment for depression in the five years before the study. Further, 5.1% indicated that there were receiving psychological treatment at the time of data collection.

Descriptives of the study variables

Table 1 presents the means, standard deviations, ranges and alpha reliabilities of the study variables. Reliabilities for all variables were moderate to high.

Prevalence of clinically significant depressive symptoms

In total 43.4% of participants had a score of 16 or higher, which is indicative of clinically significant depressive symptoms. By gender, 45.0% of females and 38.7% of males scored 16 or higher. This was not a significant difference. The mean score obtained for total depressive symptom score was 15.36 (SD 10.50, range 0–53). There was no statistically significant difference in mean scores for total depressive symptom scores between males ($M = 15.18$, SD = 10.10) and females ($M = 15.43$, SD = 10.66).

Needs assessment

The participants in the study indicated the need for help with various mental health issues (Table 2). Respondents especially indicated a need for help with anxiety, depression, physical tension, finding new goals in life and coping with HIV. A proportion of 60.7% of the participants indicated a preference for a self-help programme. In terms of the preferred mode of interventions or programmes, 50.5% would prefer programmes that involve small groups of PLWH, 17.1% individual programmes and 32.4% a combination of both individual and group programmes. Overall, 75.0% of the participants would prefer for the intervention to be in the format of a booklet, while 25.0% would prefer an online version. About half (52.2%) of the participants indicated that they had internet access. Participants preferred accessing the internet through their cellular phones (37.7%), computer (14.3%) and tablet (2.7%).

Table 2: Needs of PLWH in Botswana and feasibility of an intervention

Needs of PLWH	Indicated need for help (%)	*n*
Feelings of anxiety	72. 3	224
Feelings of sadness	70.2	225
Physical tension	64.5	220
Finding new goals in life	74.4	219
Finding people to give support	70.1	224
Finding or keeping work	70.9	220
Coping with HIV	71.2	222
Worrying	68.8	224
Preferred mode of intervention		216
Face-to-face counselling/therapy	38.0	
Self-help programme	60.7	
Other	1.3	
Desired programme format		216
Small groups of PLWH	50.5	
Individual programme	17.1	
Combination of individual and group programmes	32.4	
Preferred way of accessing HIV-related information		223
Booklet	75.0	
Internet	25.0	

Relationships among study variables: Pearson correlations and MRAs

Table 3 presents the Pearson correlations between all study variables. Findings indicate that the CERQ subscales catastrophising, refocus on planning, rumination, positive reappraisal, positive refocusing, self-blame, blaming others, and acceptance correlated significantly with depressive symptoms. The BERQ subscale withdrawal was the only one with a significant correlation with depressive symptoms.

Tables 4, 5 and 6 present the results of the three hierarchical multiple regression analyses (MRAs) with regard to depression and coping strategies, controlling for age, gender and self-rated physical health. Table 4 presents the results of the MRA with cognitive coping strategies as the independent variables and depressive symptoms as the dependent variable. After controlling for age, gender, self-rated physical health and the other cognitive coping strategies, the cognitive coping strategies rumination and catastrophising were significantly positively correlated to depressive symptoms whilst positive refocusing and refocus on planning had a significant negative relationship with depressive symptoms. All nine cognitive coping strategies and control variables together explained 34% of the variance.

Table 5 presents the results of the MRA with the behavioural coping strategies as the independent variables and depressive symptoms as the dependent variable. After controlling for age, gender, self-rated health and the other behavioural coping strategies, the behavioural coping strategy withdrawal was still significantly related to depressive symptoms. All behavioural coping strategies and control variables together explained 14% of the variance.

In Table 6, all the variables that had a significant relationship with depressive symptoms from the first and

Table 3: Pearson correlations between all study variables (Sample sizes range from 231 to 290 for pairs of variables)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Age	–																	
2. Self-rated health	0.01	–																
3.Gender	−0.08	0.01	–															
4. Depressive symptoms	−0.11	−0.15*	0.01	–														
5. Self-blame	0.05	0.01	0.00	0.27***	–													
6. Acceptance	−0.02	0.01	0.08	−0.14*	0.31***	–												
7. Rumination	−0.05	0.00	−0.09	0.32***	0.57***	0.28***	–											
8. Positive refocusing	0.13	0.09	0.02	−0.30***	0.24***	0.49***	0.20**	–										
9. Refocus on planning	0.12	0.18***	−0.05	−0.35***	0.12	0.42***	0.19**	0.61***	–									
10. Positive reappraisal	0.24***	0.11	0.05	−0.31***	0.19***	0.45***	0.14*	0.57***	0.62***	–								
11. Putting into perspective	0.05	0.09	0.08	0.27	0.30***	0.19**	0.26***	0.29***	0.37***	0.36***	–							
12. Catastrophising	0.02	−0.02	−0.09	0.36***	0.50***	0.17**	0.50***	0.07	−0.03	0.05	0.27***	–						
13. Blaming others	0.04	−0.10	0.03	0.19**	0.42***	0.10	0.36**	0.14*	0.06	0.09	0.22***	0.47***	–					
14. Seeking distraction	0.15	−0.03	−0.04	−0.12	0.20**	0.14*	0.21**	0.33***	0.27***	0.24***	0.20**	0.05	0.08	–				
15. Withdrawal	0.03	−0.09	−0.01	0.27***	0.18**	−0.07	0.31***	−0.12	−0.10	−0.02	0.21**	0.27***	0.21**	0.24***	–			
16. Actively approaching	0.08	−0.03	−0.02	−0.12	0.23**	0.25***	0.30***	0.28***	0.29***	0.36***	0.23***	0.18**	0.11	0.55***	0.21***	–		
17. Seeking social support	0.06	0.04	−0.00	−0.09	0.27***	0.32***	0.33***	0.51***	0.40***	0.39***	0.17**	0.15*	0.22***	0.34***	0.08	0.53***	–	
18. Ignoring	0.09	−0.07	−0.04	−0.05	0.19**	0.20**	0.08	0.31***	0.22***	0.19**	0.15*	−0.03	0.05	0.46***	0.13*	0.33***	0.36***	–

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

second MRA (rumination, positive refocusing, refocus on planning, catastrophising and withdrawal) were entered in the third MRA (in the second step) of the model with age, gender and self-rated physical health entered in the first step (method enter). The coping strategies that kept a significant relationship with depression were rumination, positive refocusing, refocus on planning, and catastrophising. All coping strategies and control variables together explained 33% of the variance.

Table 4: Regression analyses: cognitive coping strategies on symptoms of depression with control variables (n = 205)

Study variable	Depression (ß)
Age	−0.02
Gender	0.07
Self-rated health	0.08
Self-blame	0.15
Acceptance	−0.07
Rumination	0.23**
Positive refocusing	−0.16*
Refocus on planning	−0.18*
Positive reappraisal	−0.15
Putting into perspective	0.07
Catastrophising	0.21**
Blaming others	−0.03
Adjusted R^2	0.34***
	$F(12,192) = 9.57$

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table 5: Regression analyses: behavioural coping strategies on symptoms of depression with control variables (n = 204)

Study variable	Depression (ß)
Age	−0.08
Gender	−0.12
Self-rated health	0.08
Seeking distraction	−0.12
Withdrawal	0.36***
Actively approaching	−0.16
Seeking social support	0.01
Ignoring	0.01
Adjusted R^2	0.14***
	$F(8,195) = 5.07$

***$p < 0.001$

Table 6: Regression analyses: significant cognitive and behavioural coping strategies from MRAs 1 and 2 on symptoms of depression with control variables (n = 200)

Study variable	Depression (ß)
Age	−0.03
Gender	0.07
Self-rated health	−0.07
Rumination	0.23**
Positive refocusing	−0.19*
Refocus on planning	−0.23**
Catastrophizing	0.24***
Withdrawal	0.12
Adjusted R^2	0.33***
	$F(8,191) = 13.11$

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$

Discussion

In the present study, we found that 43.4% of the participants reported depressive symptoms that were clinically significant. This is even higher than the prior study in Botswana (Lawler et al., 2011), where prevalence rates of 24% and 38% for depression were found. Possibly this has to do with the fact that in the current study more people lived in a village or town than in the study by Lawler and colleagues. It could be that living with HIV and related stigma is even more difficult in a town or village compared with a city, leading to higher depression rates. Compared to findings from (other) sub-Saharan countries, where the pooled prevalence estimates ranged from 9% to 32% (Bernard et al., 2017), the prevalence of depressive symptoms among PLWH in Botswana is also quite high. Contrary to our hypothesis, no gender differences were found in the present study. Therefore, the findings of the present study seem to confirm the severity of the problem of depressive symptoms for both men and women living with HIV in Botswana. Depressive symptoms among men and women living with HIV in Botswana seem to be a problem that should be addressed.

We also conducted a needs assessment for PLWH in Botswana. This has never been done before in Botswana or in other countries in sub-Saharan Africa. The findings showed that many PLWH in Botswana expressed the need for help with feelings of depression, coping with HIV and finding new goals. Furthermore, a self-help booklet intervention with some personal contact was preferred by PLWH in Botswana over other intervention options. Considering the lack of resources and qualified personnel in Botswana (Lewis et al., 2012), a self-help intervention programme seems more feasible than a face-to-face intervention programme. The effectiveness of group-based intervention programmes in sub-Sarahan Africa has been studied and proven before (Kaaya et al., 2013; Petersen et al., 2014; Nakimuli-Mpungu et al., 2015). However, no self-help interventions have been studied before in Botswana or other countries in sub-Saharan Africa. Some evidence for the effectiveness and feasibility of a self-help booklet intervention programme for PLWH with depressive symptoms has already been found in the Netherlands (Kraaij et al., 2010). As such a programme would also match the self-expressed needs of PLWH in Botswana, it could be interesting to study the effectiveness of such a programme in Botswana.

In addition, we studied the relationships between coping strategies and depressive symptoms in order to find suggestions for specific targets for intervention programmes in Botswana. The multivariate analyses showed that several cognitive coping strategies had significant relationships with depressive symptoms, namely rumination, catastrophising, positive refocusing and refocus on planning (the latter two negatively). This confirmed our hypotheses and is in line with previous studies in Western countries (e.g. Kraaij et al., 2008; Kotzé et al., 2013). This suggests that future intervention programmes for PLWH in Botswana could target the same cognitive coping strategies as employed in Western countries. With regard to behavioural coping strategies, the results were not as expected. In contrast to earlier studies (Kraaij et al., 2008 Kotzé et al., 2013), actively approaching was not found to be significantly related to depressive symptoms. Perhaps actively coping with having HIV might not be helpful in Botswana, due to the high stigma in that country. Coping in an active way might not have the same positive effect as it has in progressive countries like the Netherlands. Future studies should study this into more detail. The findings of the present study suggest that cognitive coping strategies may be more related to depressive symptoms than behavioural coping strategies among PLWH in Botswana. Cognitive coping strategies, therefore, seem to be important targets for intervention programmes for depressive symptoms for PLWH in Botswana.

It is important to know whether we can generalise our findings. First, the sample comprised more females than males. In Botswana, it is estimated that more women are affected by HIV when compared with men. According to the AVERT International HIV & Aids Charity report of 2017, more than half of PLWH in Botswana are women. Therefore, the gender disparity in this study could reflect a true division of males and females in terms of HIV infection. Furthermore, the sample included participants from across the country, making it more likely to represent people from various backgrounds. In conclusion, the sample might be representative of PLWH in Botswana.

A limitation of the present study was the cross-sectional design used; we cannot make conclusions regarding the direction of the relationships between coping and depression. Future research should use a longitudinal design in order to determine causality. Furthermore, we used self-report measures for all variables and this may have resulted in social desirability bias, especially given the sensitivity of the topic of HIV. Future studies should also include clinical interviews and observations.

To summarize, as the prevalence of clinically significant depressive symptoms among PLWH in Botswana seems to be high, it is important to offer psychological help. Based on the findings of the present study, intervention programmes for PLWH in Botswana could focus on coping strategies. People could be taught to use more adaptive strategies (such as positive reappraisal and refocus on planning) and to avoid using maladaptive coping strategies (such as rumination, catastrophising and withdrawal). Furthermore, based on the current study we suggest that a self-help programme in booklet format with personal contact would suit the needs of PLWH in Botswana. Future research could study the effectiveness of such an intervention programme.

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