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Review Article

HIV/AIDS stigma-reduction on VCT uptake: An adapted systematic review

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Abstract. Both qualitative and quantitative studies have shown that stigma and discrimination impact people's decisions to access voluntary counseling and testing, (VCT) and treatment services. This systematic review attempts to answer the research question: What is the impact of HIV/AIDS-related stigma reduction interventions on VCT uptake in the developing world?

This study used a systematic review. Data was collected from five major databases during 2000 – 2011, and four studies which involved 6.651 participants. The studies were assessed using the Effective Public Health Practice Project (EPHPP) quality assessment tool which addressed selection bias, study design, confounders, blinding, data collection, and withdrawals and drop-outs.

One study had a 'Strong' Global rating; one had a 'Weak' Global rating. Two had a 'Moderate' Global rating. Other results revealed that lack of stigma, HIV-related knowledge, and self-efficacy were positively related to HIV testing. Also, stigma was found to be a significant barrier to HIV testing and disclosure. In addition, reduced stigma had significant correlations to VCT use, knowing where to get tested, and willingness to disclose test results. Very importantly, positive correlations were found between exposure to a radio serial drama program (intervention) and reduced stigma as well as greater intention to obtain HIV testing.

It would appear that revising the existing knowledge about the effectiveness of stigma interventions in reducing stigma is critical to appreciate the effects of reducing HIV/AIDS stigma on VCT uptake in the developing world. More exploratory studies, similar to the study which had a 'Strong' Global rating, should be conducted.

Key words: HIV/AIDS, Systematic review, Stigma, Interventions, VCT uptake

1. Introduction

The HIV/AIDS condition

AIDS is now 30 years old. UNAIDS reported that in 2010, in excess of 34 million people were living with HIV/AIDS (PLHA); twenty-two and a half (22.5) million of these people were from sub-Saharan Africa where 30 million deaths had occurred from the time AIDS was first identified on June 5, 1981 (1). In the initial years of the HIV epidemic, Jonathan Mann (2) referred to 'stigma' as part of the 'third epidemic', now trailing rapidly increasing HIV transmissions and AIDS cases. Further, he identified stigma, discrimination, blame, and denial as extremely problematic to address, but he acknowledged that addressing them is critical to prevent HIV.

Early in the HIV/AIDS pandemic, researchers and health practitioners were aware that HIV stigma, which has now persisted for over three decades, is an important barrier to HIV prevention, treatment, care, and support. Goffman (3) in his ground-breaking work on spoiled identity defines stigma as "a dynamic process of devaluation that 'significantly discredits' an individual in the eyes of others." There are different types of stigma: perceived, enacted, anticipated, symbolic, instrumental and internalized. Perceived stigma occurs when PLHA become conscious of negative social attitudes, diminished opportunity, and negative social identity (4). Enacted stigma occurs when PLHA feel that they have experienced prejudice and discrimination from other people in the community (5). Anticipated stigma occurs when PLHA expect to experience prejudice and discrimination from other people in the community (6). In contrast, symbolic stigma occurs when groups who have relationships with

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PLHA are subject to othering, blaming and shaming (7-8). Instrumental stigma refers to measures PLHA use to protect themselves (8), and internalized stigma arises when PLHA project negative beliefs and attitudes related to HIV/AIDS on themselves (9).

For the asymptomatic, HIV voluntary counseling and testing (VCT) includes pre-and post-test counseling from which a person can learn about his/her HIV status (10-11). According to the CDC/UNAIDS guidelines, during pre-test counseling, both counselors and clients discuss how the tests are implemented; review clients' risk behaviors and coping strategies relevant to test outcomes; consider prevention options, and review decisions to take HIV tests. During post-test counseling, counselors inform clients of their HIV status/ test results, discuss risk reduction strategies as well as suggest suitable referrals for care and support. Different types of VCT (12) are categorized as follows: free-standing services in which VCT is implemented away from a health agency, integrated VCT in which VCT is part of an existing heath agency such as a STI clinic, a tuberculosis clinic, a family planning clinic or a mobile or community outreach which has a vehicle or other mobile means that can provide VCT services to hard-to-reach populations, home-based VCT (HBVCT) in which counselors provide door-to-door VCT services, routine testing and counseling (RTC) in which HIV tests are available as part of routine medical care, and diagnostic counseling and testing in which a health worker provides HIV testing and counseling as part of the diagnostic workup for patients with HIV symptoms.

Over the years, qualitative studies have shown that stigma and discrimination impact people's decisions to access VCT and treatment services (13-19). Quantitative studies have also reported similar findings (20-29). It is, therefore, not surprising that UNAIDS/WHO (30) have confirmed that stigma and discrimination continue to be major obstacles that prevent people from engaging in HIV testing. A survey of patients obtaining ART in Botswana found that 40% of the patients deferred doing the HIV test as a result of stigma. Another survey of injecting drug users in Indonesia found that 40% of this category of drug users indicated that they postponed HIV testing because of stigmatization (31). For these reasons, VCT is a critical first step to treatment, and care, and it is also a hub for HIV prevention globally (32-34). This apparent importance of VCT is also recognized by UNAIDS.

The Population Council established the Horizons Program in 1997. This program was funded by the United States Agency for International Development (USAID) in collaboration with the International Center for Research on Women, the International HIV/AIDS Alliance, PATH, Tulane University, Family Health International, and Johns Hopkins University. Horizons investigated six domains of stigma: HIV-related stigma, access to antiretroviral therapy, men who have sex with men, orphans and vulnerable children, HIV and gender, and prevention of mother-to-child transmission of HIV. Investigating HIV/AIDS stigma at the individual, institutional, and governmental level became a priority throughout the decade-long Horizons Program (35). Although the Horizons program started in 1997, the impact of stigma on HIV transmissions was well known because some programs had already focused on its effect. However, there was not much knowledge of the drivers of stigma, especially the precise manner in which stigma impacts HIV outcomes. In addition, there were inadequate tools to measure stigma, and there was limited information that could shed light on which intervention design could prove useful for reducing stigma (35). Available HIV/AIDS-related stigma reduction intervention studies were few in number, and even fewer intervention studies were evaluated (36); in fact, although stigma was a barrier to successful responses to the HIV/AIDS epidemic, action to combat stigma was relegated to low program priority. Furthermore, they suggested that the complexity of HIV/AIDS stigma and discrimination may be responsible for this limited response (36). For these reasons, reducing stigma is critical for positively impacting HIV/AIDS prevention (37-39), (11), and producing VCT uptake.

While it is clear that people have to better understand stigma as a barrier to HIV testing, especially now that testing has become the 'critical gateway' for HIV prevention and treatment (40), there is a paucity of systematic review of HIV/AIDS stigma-reduction interventions. For these reasons, this systematic review attempts to fill the gap by answering the research question: What is the impact of HIV/AIDS-related stigma reduction interventions on VCT uptake in the developing world?

The developing world refers to low and middle-income countries with a score of <0.9 on the

Human Development Index (HDI) (41). Further, this study would provide recommendations to inform future research agenda of HIV/AIDS stigma reduction intervention studies.

2. Methods

2.1. Search strategy

The researcher used the Population Intervention Comparison Outcome (PICO) search strategy. To answer the question on: what is the impact of HIV/AIDS-related stigma reduction interventions on VCT uptake in the developing world?, the researcher searched five major databases between May and July 2011 for the years 2000 – 2011: Embase, PsycINFO, Medline, Web of Science, and Cochrane Reviews using key terms that included 'HIV/AIDS AND stigma'. The following search terms were used: hiv, aids, stigma, blame, shame, attitudes, prejudice, stereotyp*.mp., discrimna*.mp., reducing stigma, pamphlet*.mp., posters*.mp., skit*.mp., voluntary counsel*.mp. or exp counseling/vct.mp., one-on-one counsel*.mp., communication*.mp., voluntary counsel*.mp., peer group, peer education, health education, visual information, guided group discussions, group desensitization, support group, media advertisements (*indicates wildcard). Reference lists from included studies were tapped for other studies. Internet searches - Google Scholar - and hand searches were also conducted, using additional search terms: HIV/AIDS stigma-reduction interventions and VCT uptake. For hand searches, the researcher reviewed the following journals: AIDS, AIDS and Behavior, and AIDS Care. The WHO and UNAIDS websites were also searched to identify relevant studies and data on HIV/AIDS stigma reduction interventions and VCT uptake.

The criteria to include studies were the following: Randomized controlled trials (RCTs) pretest-posttest, and quasi-randomized clinical trials, with either multiple or one-type of intervention with a control. Observational studies with control were included when there were no RCTs or quasi-randomized clinical trials. Ideally, the study design had to be experimental or quasi-experimental with a control group, except in cases where it would have been difficult to establish a control group for ethical reasons. Observational studies had to be used because of the inadequate number of experimental studies. This systematic review had to identify an intervention with some components to reduce HIV/AIDS stigma, which produced an uptake in VCT as the primary outcome.

2.2. Selection of studies

The researcher reviewed the titles and abstracts using broad relevance criteria, inclusive of PICO. Full texts of abstracts that satisfied the relevance criteria were retrieved. The researcher also removed duplicate records, and obtained full texts of potentially relevant studies. Those full-text studies that met the criteria for inclusion were included in the review. Those studies that did not satisfy the criteria for inclusion were excluded from the review, and reasons for exclusion were recorded.

2.3. Data extraction and management

Using a modified version of the checklist for data extraction (Table 7.3.a) of the Cochrane Handbook, the researcher extracted data to include in the table created for the studies. Data included the following characteristics: source, methods, participants, interventions, outcomes, and results. Data on participants included age, sex, ethnicity, education, and co-morbid conditions. The researcher also extracted data on settings of the studies such as workplaces, family households, and health care facilities. All experimental and comparison interventions were collected, so that the characteristics could be included in the studies. Data on results focused on pre-specified outcomes. There were no ongoing studies.

2.4. Assessment of risk of bias in included studies

Quality assessment of studies with regard to detecting and reducing bias, aiding interpretations, and providing an understanding into probable comparisons is critical for a systematic review (42). In this context, the Cochrane Health Promotion and Public Health Field (43-44) recommended The Quality Assessment Tool for Quantitative Studies of the Effective Public Health Practice Project (EPHPP) to assess the methodological quality of the quantitative studies that were included in this review (45).

The quantitative tool assesses quality and allows each study included in the review to have a rating score for the following: selection bias, study design, confounders, blinding, data collection methods, withdrawals and dropouts, intervention integrity, and analysis appropriate to the question.

3. Results

To respond to the research question: What is the impact of HIV/AIDS-related stigma reduction interventions on VCT uptake in the developing

world?, the researcher selected four (4) studies that addressed HIV stigma reduction interventions and contained VCT uptake as an outcome.

Figure 1 indicates the selection process of the four studies for this systematic review, using the PRISMA guidelines.

The electronic bibliographic databases of Embase (1980 – 2011, Week 26), PsycINFO (1806 to June Week 4, 2011), Ovid MEDLINE(R) (1948 to June Week 4, 2011), ISI Web of Science, and Cochrane Reviews provided 1689 titles (Figure 1). Ancestry and hand searches elicited 20 citations, producing a total of 1705 studies. Intensive reviews of titles and abstracts reduced the total studies to 27, excluding 1678. The researcher assessed the remaining 27 studies and found that 23 met only one of the criteria for inclusion because they contained no measurement of stigma reduction intervention, no inclusion of VCT uptake, and stigma was not a component of the intervention. The researcher, therefore, excluded the 23 studies. Four studies met all the criteria, except that only one used a quasi-experimental study with control, and three used observational study designs. Ideally, it would have been useful to include true experimental designs because they are capable of making statistical inferences on the effectiveness of interventions.

23 studies excluded in this review either did not include or measure stigma reduction intervention. Below are the excluded studies with their characteristics and rationale for exclusion:

Reason for exclusion: Stigma-reduction interventions were not included in the studies to demonstrate the impact on VCT uptake.

The studies excluded conducted the following: examined the relationships between VCT uptake and reproductive history and socio-demographic factors in North Uganda (46); used a population-based household survey and a government clinical survey in South Africa to assess the attitudes to VCT services, utilization patterns of VCT services, and relationships between HIV/AIDS-related stigma, VCT availability, and the quality of VCT usage (25); recognized psychological and structural barriers to HIV testing among MSM in China, using a self-administered questionnaire (47); conducted a random community survey of 300 rural young women in Burkina Faso to establish whether HIV/AIDS knowledge and ethnicity impact risk

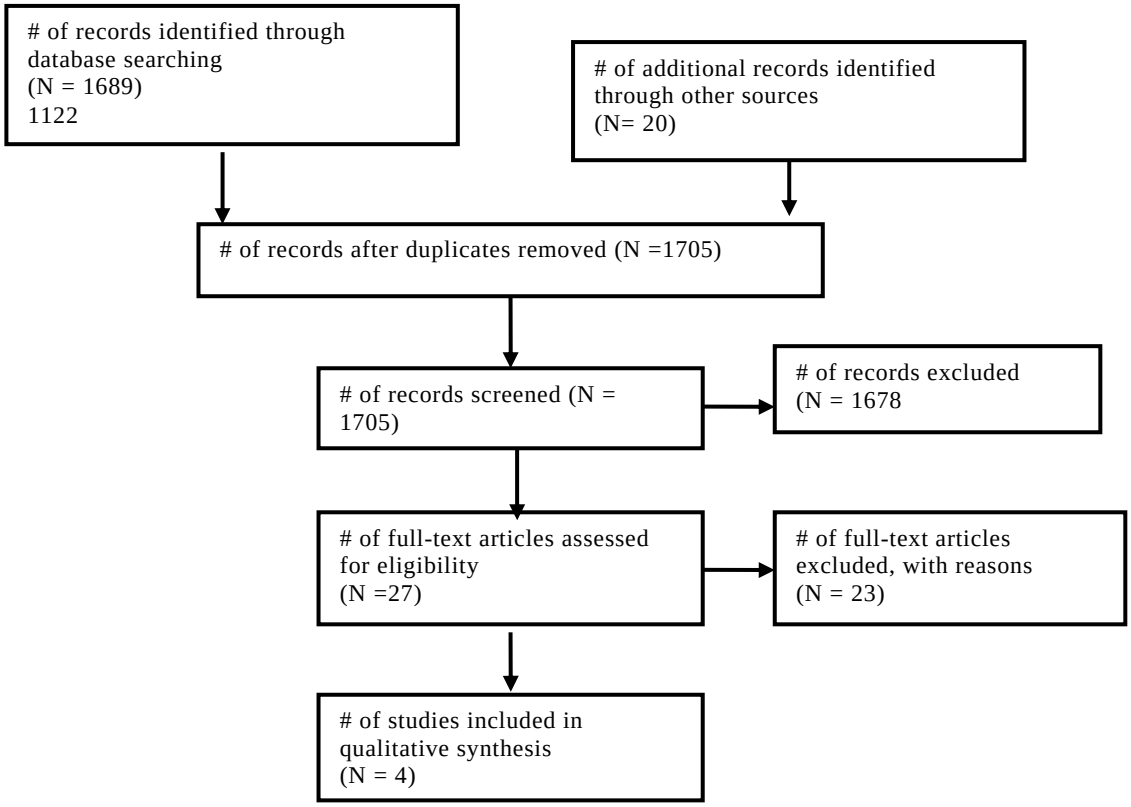

Fig. 1. Flow-Chart of Search Activities (Source: annals.org on PRISMA).

perception and willingness to do the HIV test (48); used a cross-sectional two-stage cluster sampling to gather information on adults' HIV/AIDS knowledge of VCT and attitudes toward acceptance of VCT in two communities in China, one with a comprehensive HIV/AIDS program, and the other without (49); conducted a rural clinic-based study in India by profiling adults accessing VCT (50); Sambisa, Curtis, and Mishra (20) studied the effects of AIDS stigma on VCT in Zimbabwe.

Reason for exclusion: No interventions were addressed in the studies. Peltzer, Mlambo, and Phaweni (51) addressed factors related to engage and disengage in VCT at antenatal clinics in South Africa. Nuwaha's study (52) addressed factors affecting participation in VCT in Uganda. Kellerman et al. (53), in a cross-sectional study, assessed VCT behavior among high-risk persons in six States in the U.S. Maman et al. (54) studied women's deterrents to HIV-1 VCT in Tanzania. Hendriksen et al. (55) studied whether communication impacted VCT uptake in Tanzania, Zimbabwe, South Africa, and Thailand.

Reason for exclusion: No stigma-reduction interventions were addressed in the studies. Peralta et al. (56) conducted cross-sectional study that focused on barriers and facilitators influencing HIV testing of youths in Baltimore. Keane et al. (57) focused on a quantitative evaluation of HIV pre-test counseling in their study.

Reason for exclusion: Implied stigmatized factors required for 'confidentiality' and a 'testing center other than the medical clinic were included, but there was no direct measurement of stigma and stigma-reduction interventions. Fylkesnes and Siziya (58) investigated factors influencing readiness for and acceptability of VCT in Zambia.

Reason for exclusion: The study addressed the need to destigmatize HIV testing, but it did not include intervention on VCT uptake. Bokhour et al. (59) focused on understanding deterrents and facilitators for routine HIV testing at the U.S. Department of Veterans Affairs.

Reason for exclusion: There was measurement of the Health Belief Model's components, but there was no measurement of any stigma-reduction intervention. De Paoli, Manongi, and Klepp (60) conducted a cross-sectional study of pregnant women's willingness to accept VCT in Tanzania.

Reason for exclusion: The study did not address 'Stigma' as a component of mass media interventions. Vidanapathirana et al. (61) assessed mass media interventions on HIV testing.

Reason for exclusion: This study did not address 'Stigma' as a component of the intervention; there was only one study in this systematic review which did. Bateganya, Abdulwadud, and Kiene (12) assessed the impact of home-based VCT on VCT uptake.

Reason for exclusion: This study used intervention that was intended to reduce sexual risk. Exner et al. (62) examined women's perception of VCT as a preventative measure in NYC.

Reason for exclusion: In this study, the life-skills-based HIV prevention education intervention had stigma and discrimination as components in the curriculum, but there was no measurement of stigma-reduction intervention. Burnett et al. (63) focused on whether HIV education intervention can change HIV knowledge, attitudes, and HIV testing.

Reason for exclusion: The study did not address any measurement of stigma-reduction intervention, though a case was made for ~~a~~ community stigma-reduction intervention. Koku's study (64) addressed the desire for VCT and VCT uptake among Ghanaian women.

Reason for exclusion: The study did not include stigma-reduction intervention as a variable. Kalichman and Simbayi (22) reviewed HIV test history, attitudes toward HIV testing, and HIV/AIDS stigmas in South Africa.

Table 1 summarizes the four included studies according to types of interventions and study designs, without apportioning ratings. Table 2 assesses methodological quality through EPHPP.

Only one study used a quasi-experimental pre-test/post-test study/design with control was conducted in Brazil (65-66). Three studies used observational study designs (67-69). These three studies were conducted in different parts of Africa: Malawi (67), Botswana (68), and Lesotho, Malawi, South Africa, Swaziland and Tanzania (69). Two studies concentrated on male and female adolescents and adult households (67-68); one on male truckers (65-66); and one on nurses and PLHA (69). Interventions had an interval of one month to 18 months. Applying Brown, Macintyre, and Trujillo's schema of interventions (70), it was found that all three included studies used informational approaches. One study used both informational approaches and counseling and support (65). Two studies with cross-sectional designs without control would not have the capacity to demonstrate any causal relationship between radio program exposure

Table 1. Interventions and Outcomes

Study ID	Study Population	Sample size	Types of Intervention	Outcomes	Study Designs
Berendes and Rimal, 2011 Malawi	Family households – male, female adolescents and adults	890 (baseline); 881 (mid-term evaluation survey)	The Malawi BRIDGE Project: entire range of media interventions – television, radio, billboards, posters, and pamphlets	HIV-related knowledge, stigma, self-efficacy positively associated with HIV testing; positive association between knowledge exposure and HIV-related knowledge, stigma, and self-efficacy	Cross-sectional, pre- and post- without control
Pulerwitz et al, 2008; Chinaglia et al., 2007 Brazil - Uruguiana (control) and Foz do Iguacu (intervention)	Male truckers	1775 (pretests); 2415 (posttests)	The Brazilian International Borders Trucker Project: setting up a health post at the customs station to provide VCT for HIV; syndromic management of STIs; other services as blood pressure measurement and diabetes testing; outreach activities, group HIV/STI education, and condom promotion – an 18-month intervention.	Improvement in HIV testing	Quasi-experimental pre- and post-intervention evaluation, with control group
Pappas-DeLuca et al., 2008 Botswana	Family households	807	The Botswana Makgabaneng Radio Serial Project: serialized entertainment-education radio programs, utilizing fictional characters to model a change process through a number of episodes, and follow the consequences of their decisions – 18 months of exposure to the broadcast of Makgabaneng	Positive association between program exposure and stigma reduction, intention to do HIV test, talk to a partner about HIV testing; Increase in listening time related to more positive outcomes than the other measures of exposure	Cross-sectional without control; evaluation at 18 months after Makgabaneng started
Uys et al., 2009	Nurses with an interest in HIV/AIDS care, and PLHA;	The intervention team for each site comprised 10 nurses with an interest in HIV/AIDS care, and 10 PLHA; and the total intervention team for the five sites: n = 84 (Team nurses and Team PLHA) came from the following countries: Lesotho 16.6% (n = 14), Malawi 21.4% (n = 18), South Africa 20.2% (n = 17), Swaziland 17.8% (n = 15), and Tanzania 23.8% (n = 20). Average age in the five intervention teams: 37.9 years. Females: 79.8% (n=67). Setting nurses for the five sites: n = 134.	The Five African Countries' PLHA-Nurses' Project: Putting a team of PLHA and nurses to provide information and empowerment vis-à-vis workshops	HIV test; self-esteem; self-efficacy	Multiple case study without control; the case study protocols: intervention team description; duration of contact; team project; pretest and posttest data of teams (without control); team evaluation of project

Table 2. Risk of Bias Assessment of Included Studies

	Berendes and Rimal, 2011	Pulerwitz et al., 2008	Pappas-DeLuca et al., 2008	Uys et al., 2009
A) SELECTION BIAS				
(Q1) Are the individuals selected to participate in the study likely to be representative of the target population?	Very likely; households were randomly selected in eight critical districts; the overall sample had a fair representation of youth and adult respondents.	Very likely; systematic sampling used to select truck drivers where every fourth truck driver was chosen as they arrived at the customs stations; sample representative of truck drivers passing through the Brazilian borders, but may not be representative of truck drivers in Latin America	Very likely; multistage sampling of 7 of 22 health districts which comprise about half the population of Botswana aged 15 – 49; did a systematic sampling of 60 enumeration areas from these 7 districts	Not likely; small samples of nurses conveniently selected
(Q2) What percentage of selected individuals agreed to participate?	Both pre and post-intervention: almost 100%; fewer than five who were requested to participate, refused	Pre-and post-intervention: 77%	84% (no pre/post-intervention)	Pre- and post-intervention: 100% of small samples
RATE THIS SECTION	Strong	Moderate	Strong	Weak
B) STUDY DESIGN				
Indicate the study design	Two independent cross-sectional studies – baseline and post-intervention with no controls	Quasi-experimental pre- and post intervention with control and systematic sampling	Cross-sectional study with no controls	A pilot multiple case-study design – pre-test/post-test, with no controls
RATE THIS SECTION	Weak	Strong	Weak	Weak
C) CONFOUNDERS				
(Q1) Were there important differences between groups prior to the intervention?	Yes: Age; < 18 to > 54; gender; marital status; education	Yes: Nationality; age (median age = 40); years of schooling; years working as a trucker; monthly personal income	Yes: Age (15 – 49); sex; education; language (Setswana); sexually active; age at first sex; marital status; rural or urban residence	Yes: Age (average age = 37.9); gender; geography; health care settings; PLHA; nurses
(Q2) If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?	80 – 100%: An unadjusted linear regression used to evaluate the relationship between exposure	80 –100%: Logistic regression analysis reviewed the relationships of the stigma scale and the categories	80–100%: Multivariate analyses were utilized to test for likely confounding effects of sociodemographic	Cannot tell

	Berendes and Rimal, 2011	Pulerwitz et al., 2008	Pappas-DeLuca et al., 2008	Uys et al., 2009
	and each outcome variable; then, adjustment for demographic variables was made in model 1 for each set; finally, adjustment was made for demographic variables and psychosocial variables in model 2.	of items within each factor.	variables; logistic regression was used to analyze outcomes for 'testing' and talking about testing,' multinomial regression for the 'intention to test', and ordinary least squares regression for 'stigma'; adjustment was made in the multivariate model for sex, age, education, marital status, age at first sex, and rural or urban residence.	
RATE THIS SECTION	Strong	Strong	Strong	Weak
D) BLINDING				
(Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?	Cannot tell; no control group; VCT uptake as the primary outcome is immune to detection bias.	Cannot tell; control group	Cannot tell; no control group; VCT uptake as the primary outcome is immune to detection bias.	Cannot tell; no control group; VCT uptake as the primary outcome is immune to detection bias.
(Q2) Were the study participants aware of the research question?	Cannot tell	Cannot tell	Cannot tell	Cannot tell
RATE THIS SECTION	Moderate	Moderate	Moderate	Moderate
E) DATA COLLECTION METHODS				
(Q1) Were data collection tools shown to be valid?	Yes: The instruments were a product of prior surveys by the research team and contained questions utilized by demographic and health surveys (MEASURE DHS, n.d.; Rimal et al., 2008)	Yes: The stigma scale has predictive validity; the survey contained 17 questions on stigma drawn from literature reviews, formative studies in Brazil, and discussions with USAID's Interagency Stigma and Discrimination Indicators Working Group	Yes: The survey instrument was developed in interface with the Technical Working Group for HIV-related Behavioral Surveys in Botswana; the instrument was further revised after three pilot tests	Yes: Utilizing multiple sources of data improved the construct validity of the study design; utilizing five case studies improved the external validity
(Q2) Were data collection tools shown to be reliable?	Yes: Internal consistency was shown for the variables	Yes: The stigma scale has appropriate internal consistency reliability for the stigma scale	Yes: Internal consistency was shown for six statements on stigma	Yes: Utilizing case study protocol improved the reliability
RATE THIS SECTION	Strong	Strong	Strong	Strong
F) WITHDRAWALS AND DROP-OUTS				
(Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?	Cannot tell	Cannot tell	Cannot tell	Cannot tell

	Berendes and Rimal, 2011	Pulerwitz et al., 2008	Pappas-DeLuca et al., 2008	Uys et al., 2009
(Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).	N/A	77%	N/A	Cannot tell
RATE THIS SECTION	Moderate	Moderate	Moderate	Weak
GLOBAL RATING	Moderate	Strong	Moderate	Weak

Source: EPHPP, 2009. McMaster University Faculty of Health Sciences.

and increased HIV testing with regard to reduced HIV/AIDS stigma (67-68). Outcomes from the multiple case study without control and in which posttests were administered within one month (not allowing sufficient time to assess sustainability of intervention effects) (69), were exploratory. Quasi-experimental pre- and post-intervention evaluation with control conducted showed that male truckers increased their HIV testing behavior, as an outcome of the 18-month multi-purpose health clinic intervention (65). Also, the intervention demonstrated some sustainability in its duration of just under two years.

The Malawi BRIDGE Project was expected to reduce stigma and produce increased knowledge and self-efficacy levels among the people generally (67). There was a positive relationship between exposure to the BRIDGE Project and HIV-related knowledge ($B=2.08$, $p<0.001$). There was a significant relationship between exposure to the BRIDGE Project and HIV-related stigma ($B=-0.08$, $p<0.001$). When adjusting for possible demographic variables, those persons who had exposure to the BRIDGE Project through several intervention channels showed reduced stigma toward the PLHA ($B = -0.08$, $p<0.001$). This association was sustained even when HIV knowledge and self-efficacy were incorporated in the model ($B = -0.06$, $p<0.001$). When adjusting for demographic predictors, those persons who had exposure to the BRIDGE Project had increased levels of self-efficacy ($B=0.07$, $p<0.001$). This association was still significant when HIV knowledge and stigma were incorporated as control variables ($B=0.05$, $p<0.001$). The results support the hypothesis that exposure to the BRIDGE Project produced increased HIV-related knowledge and self-efficacy, and facilitated HIV testing uptake.

Logistic regression analysis was applied in the The Brazilian International Borders Trucker Project (65-66) to determine the association between stigma and service utilization for HIV testing and disclosure of HIV test results. The results showed that with each unit of the stigma score, the odds of ever accessing HIV testing decreased by 4% (OR=0.96; 95% CI:0.94, 0.97). In addition, the odds of knowing locations for free HIV testing also decreased by 4% (OR = 0.96; 95% CI: 0.94, 0.98). The odds of disclosing test results decreased by 4% (OR=0.96; 95% CI: 0.93, 0.99). Each unit increase in stigma raised the odds of not disclosing by 7% (OR = 1.07; 95% CI: 1.05, 1.09).

When those persons who reported listening to Makgabaneng (68) once or twice weekly were compared with those persons who reported listening infrequently and not at all, the former group was twice likely (adjusted odds ratio (AOR) = 1.8) to have inclinations for HIV testing. When comparisons are made with those who listened for less than one year or did not listen at all, longer-term listeners (1 year or more) were twice likely (AOR = 2.1) to have inclinations to do the HIV testing in the next three months. When those persons who listened for one year or more were compared with those persons who listened for a lesser duration or not at all, those who listened for one year or more were more than twice likely (AOR = 2.45) to discuss HIV testing with their partners.

In The Five African Countries' PLHA-Nurses' Project (69), nurses who were exposed to the stigma reduction intervention showed no change in stigma, but a large number of them accessed HIV testing by the time the project expired ($X^2 = 12.18$, $df = 1$, $p<0.001$).

3.1. Assessment of Methodological Quality

3.1.1. Risk of bias in included studies

The Cochrane Health Promotion and Public Health Field (42-43) suggested The Quality Assessment Tool for Quantitative Studies (45) to be a useful tool to evaluate methodological quality of quantitative studies. The researcher used this EPHPP quality assessment tool to determine risk of bias in the studies that were

included in this systematic review. The component ratings comprise selection bias, study design, confounders, blinding, data collection methods, and withdrawals and drop-outs. Table 2 shows the risk of bias assessment of the studies included through EPHPP.

One study used a quasi-experimental design with control (65-66). Three of the study designs were observational with no controls (67-69). Three studies used random sampling (67); (65-66), (68), and one study used convenience sampling (69).

3.1.2. Selection bias

Participants in the BRIDGE Project study (67) were somewhat likely to be representative of the target population because the sample from cross-sectional baseline survey was drawn from eight critical districts in Malawi – Balaki, Chikwawa, Kasungu, Mangochi, Mulanje, Mzimba, Ntcheu, and Salima.

By virtue of the systematic sampling used in the quasi-experimental study with control in Brazil (65-66) truck drivers as participants were likely to be representative of truck drivers driving through Brazil, but they may not be typical of truck drivers of the entire South America region. Also, most of the participants were Brazilians (73%), Argentines (13%), and Paraguayans (10%). Brazil, Argentina, and Paraguay are only three of the 13 countries that comprise South America. There were significant differences in stigma among these three nationalities; for instance, Paraguayan truck drivers were more likely than Brazilian and Argentine truck drivers to believe that they would be summarily dismissed if they contracted HIV, and that HIV-infected people should not be given employment. It is difficult to ascertain from this study whether stigma differences existed among the other South American countries, and whether the intervention utilized could be effective elsewhere in the region. For these reasons, truck drivers in this study may not be representative of a target population of truck drivers of the South American region.

Participants in the Makgabaneng study (68) were somewhat likely to be representative of the target population because the sample was selected from 22 health districts that comprised about half the population of Botswana, and the sample had a fair representation of youth and adults.

Participants in the case study of stigma intervention in Lesotho, Malawi, South Africa, Swaziland, and Tanzania (69) were not likely to be representative of the target population of nurses and PLHA in those countries because the sample of nurses was based on convenience sampling.

3.1.3. Study design

Only The Brazilian International Borders Trucker Project (65-66) had a strong study design, using a quasi-experimental design with control. Both The Malawi BRIDGE Project (67) and The Botswana Makgabaneng Project (68) had weak study designs because they used cross-sectional designs without control. The Five African Countries' PLHA-Nurses' Project (69) also had a weak study design because it used a multiple case study without control. Any study that is not a RCT, CCT, or quasi-experimental, cohort, or case-control study is given a rating of 'weak' study design' (44).

3.1.4. Confounders

The Brazilian International Borders Trucker Project (65-66), The Malawi BRIDGE Project (67), and The Botswana Makgabaneng Project (68) had 'strong' ratings for controlling confounders. In The Brazilian International Borders Trucker Project, confounders were controlled at the analysis stage through logistic regressions, which reviewed the associations of the stigma scale with items from each factor in conjunction with the key study outcomes. The Malawi BRIDGE Project also controlled for confounders; unadjusted and adjusted regression models were calculated with HIV testing as the outcome variable and psychosocial variables as the predictors or explanatory variables. The Botswana Makgabaneng Project controlled confounders, too, through use of unconditional logistic regression for analyzing outcomes of testing, talking about testing, multinomial regression for the intention to test, and ordinary least squares regression for stigma. Subsequently, each multivariate model was adjusted for sex, age, education, marital status, age at first sex, and rural/urban residence. The Five African Countries' PLHA-Nurses' Project (69) had limited control of confounders.

3.1.5. Blinding

There was moderate blinding in all four studies.

3.1.6. Data collection methods

Data collection tools were found to be both valid and reliable.

There was, on the whole, a quality rating for each of the four studies. The Brazilian International Borders Trucker Project (65-66) was the only study that had a "Strong' Global rating. Two of the four studies had a 'Moderate' Global Rating: The Malawi BRIDGE Project (67) and The Botswana Magkabaneng Project (68).

The Five African Countries' PLHA-Nurses' Project (69) carried a 'Weak' Global rating.

4. Discussion

This systematic review returns to the issue concerning the accessibility of HIV/AIDS stigma-reduction interventions to impact VCT uptake. It is well known that stigma poses a significant barrier to people accessing HIV testing. This review has significance for public health because it assessed whether stigma reduction interventions resulted in any enhanced change in VCT uptake.

The researcher assessed the quality of the four studies included in this review by rating their selection bias, study design, confounders, blinding, data collection methods, and withdrawals and dropouts. The researcher then provided an overall rating for each of the four studies. The four studies in this review (65- 68) showed limited prospects of HIV/AIDS stigma-reduction interventions impacting VCT uptake, but they all showed some effectiveness in reducing stigma.

In this systematic review, only The Brazilian International Borders Trucker Project (65-66) had a 'Strong' Global rating. Sengupta et al. (71) found that only two of 14 effective studies had 'good' quality ratings. In this researcher's review, only one of four studies had a 'Strong' Global rating. Sengupta et al. (71) concluded the following in their systematic review:

"The paucity of good quality studies within the last 20 years identified in this review reveals the current gaps in evidenced-based interventions to reduce HIV/AIDS stigma. These gaps include (1) not enough interventions targeting HIV/AIDS stigma, (2) using disparate and inadequate measures to evaluate HIV/AIDS stigma reduction…"

Although there is a link between HIV stigma and HIV prevention, treatment, care and support with regard to HIV testing, there is a paucity of systematic reviews of stigma-reduction intervention studies (70-72). Very importantly, these three studies showed that stigma can be reduced.

The number of studies included in this review is small, but 23 studies were excluded because they either did not include or measure stigma reduction intervention. The Malawi BRIDGE Project (67), The Brazilian International Borders Trucker Project (65-66), The Botswana Makgabaneng Project (68), and The Five African Countries' PLHA-Nurses' Project (69) used disparate and inadequate measures of stigma. These measures ranged from a 5-point scale on positive and negative attitudes to PLHA (67); a 6-point scale in 2000 on the 17 items on stigma with regard to the USAID Interagency Stigma and Discrimination Indicators Working Group, UNAIDS (68); a 19-point scale for nurses where nurses experienced stigma and where nurses stigmatized patients, and a 33-point scale focusing on six items of stigma for PLHA (verbal abuse, negative self-perception, health care neglect, social isolation, fear of contagion, workplace stigma), including perceived stigma (69).

The researcher acknowledges that the quality assessment tool (EPHPP) component rating on study design is biased in favour of RCTs and CCTs, a cohort analytic study, cohort, or a case-control study, so that any other study design is attributed a 'weak' rating. Reeve (73) noted that the existing dominant mode of science embraces positivist realism which has its own study designs that approximate the truth, and what is referred to as the hierarchy of evidence or truth. Meta-analysis, systematic reviews, RCTs, and CCTs come closest to the golden standard of truth, with cohort and case-control studies relegated to the middle order of the hierarchy, and cross-sectional, case series, and case study designs downgraded to the bottom of the hierarchy of evidence. This positivist view is not universally accepted, and the fact that there are different methods of reviewing the same thing would suggest that no one perspective should be credited with superior status and accorded the status as the sole source of truth. Knowledge is not something that people discover, as the positivists believe; it is something that people make (73). Quality assessment of anything must focus on the total processes and assumptions reinforcing its creation, which involves reviewing many different perspectives (74). Nevertheless, the EPHPP's methodology accepts the assumptions of the hierarchy of evidence, with one dominant mode of science, and in which RCTs have top billing at the highest levels of the hierarchy of evidence.

Clearly, RCTs continue to wield considerable influence on health care policy and funding.

While there is a paucity of RCT studies on HIV/AIDS stigma reduction interventions, several observational studies are available. Kalichman and Simbayi (22) using a cross-sectional study design, noted that in the black township of Capetown, HIV/AIDS-related stigma acted as a barrier against HIV testing. The findings of this study are consistent with the findings in the four studies included in this review. However, Kalichman and Simbayi (22)

found that HIV testing had no association with HIV/AIDS knowledge, quite contrary to the finding in The Malawi BRIDGE Project (67). Additionally, in a survey with multi-stage random sampling, social norms exerted an intervening influence on personal perceived stigma and readiness for HIV testing, and that in order to reduce HIV stigma, it was insufficient to aim only at individual cognitive processes (23). It was also vital to focus on social structures to change negative social norms. Two of the four studies included in the review, The Malawi BRIDGE Project (67) and The Botswana Makgabaneng Project (68) tried to do likewise by encouraging people to change their negative behaviors toward PLHA.

The literature is clear on the role of stigma as a key barrier to HIV prevention, treatment, care, and support. The four studies included in this review attempted not only to show the 'barrier' role of stigma, but also to suggest that psychosocial variables which include stigma, and other variables such as self-efficacy, knowledge, etc., are related to a person's chance of obtaining HIV testing. A population-based survey and a government clinic survey found that VCT utilization was related to reduced HIV stigma, education, age, socioeconomic status, proximity to clinics, rapid testing, and outreach services, but other than stigma, additional psychosocial variables were not used (25).

Both the population-based survey of Zimbabwe women and men (20), and The Brazilian International Borders Trucker Project (65-66) made available provider-initiated counseling and testing (PICT) services which increased testing uptake for both male truckers at the Brazilian borders, and Zimbabwe women. PICT tends to improve HIV testing uptake (75-76). Yet in Ethiopia, there was a low uptake of HIV testing among TB patients (77). Apparently, the level of education, perceived benefits of HIV PICT, knowledge of PICT, and stigma had an independent relationship with HIV testing among TB patients in Ethiopia (21). Furthermore, the Sambisa, Curtis, and Mishra study (20) noted that in the process of developing strategies to increase testing uptake, some considerations should be given to reducing stigma toward the PLHA, especially in light of The Five African Countries' PLHA-Nurses' Project conclusion that PLHA's stigmatizing experiences can be reduced.

The four studies included in this review had several limitations. These four studies addressed the primary outcome (VCT uptake), but did not address all the secondary outcomes. Pronouncements, therefore, on the effectiveness of interventions from this review would be limited, as the electronic bibliographic searches did not find any true experimental design on the impact of stigma reduction intervention on VCT uptake. The number of studies included in this review was small. Participants only expressed desire for VCT in one study (67), and in another study, participants showed intention to engage in VCT (68); nonetheless, these two studies presented no data to show that desire and intention were translated into action to engage in VCT. There were three studies without a control group (67-69), suggesting that there should be some vigilance in interpreting the findings of their studies. With no control group in a study, it is difficult to pronounce that change can be attributed to the intervention utilized. For this reason, these three studies demonstrated no significance for public health.

The Malawi BRIDGE Project (67); and The Botswana Magkabaneng Project (68) utilized a cross-sectional design, which does not allow for any causal inference to be made between stigma-reduction interventions and VCT uptake. There is also a possibility of reporting bias in face-to-face interviews in these two studies. The reporting bias arising from social desirability could have produced an underreporting of stigma and an over-reporting of willingness to engage in VCT. While the sustainability of intervention effects over time was not tested, the two-year gap between pre-test and post-test in the Berendes and Rimal study (67) would suggest that some changes could be attributed to the BRIDGE intervention, given that in this study there was, also, a desire to engage in VCT. While one study provided preliminary results (68), sustainability of intervention effects over time was not tested (67-69). Nurses and PLHA were conveniently selected, possibly incurring selection biases (69). A final limitation of this review is selection bias, resulting from the researcher administering both study selection and extracting data.

Indisputably, there is a paucity of HIV/AIDS stigma-reduction intervention studies and their impact on VCT uptake. However, it is possible that most of the assessments of methodological quality of HIV/AIDS stigma-reduction intervention studies use tools that favour RCT and CCT studies. This method largely excludes assessments of methodological quality of observational studies that also attempt to identify the most effective HIV/AIDS stigma-reduction interventions and their influence on VCT uptake. Applying this approach, however, creates a

challenge to those wedded to RCTs and CCTs and the traditional hierarchy of evidence as the sole gold standard for truth.

5. Conclusion

Revising the existing knowledge on HIV/AIDS stigma-reduction interventions is critical to appreciate how reduced stigma can impact VCT uptake and other public health outcomes. More exploratory studies, similar to the study assessed as having a 'Strong' Global rating (65-66), should be conducted. Furthermore, the researcher recommends that more observational studies be conducted on HIV/AIDS stigma-reduction interventions to add greater credibility to the traditional hierarchy of evidence because stigma might have foundations in community beliefs and practices as well as religion.

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