original article

The application of intervention mapping in developing STI/HIV health education program for traditionally circumcised men in the Eastern Cape Province of South Africa

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South Africa faces challenges in reducing the incidence of human immunodeficiency virus (HIV) infections. In 2012, approximately 5.5 million persons reportedly lived with HIV, with an infection rate of 11.6% in the Eastern Cape Province (Shisana et al., 2014). Heterosexual intercourse is reported as the primary mode of HIV transmission in South Africa. Several studies demonstrated that well-designed HIV/AIDS education programmes have positive effects on reducing risky sexual behaviours among young people including delaying sexual debut, reducing the number of sexual partners, increasing condom negotiation skills and use (Gallant & Maticka-Tyndale, 2004; Johnson, Carey, Marsh, Levin, & Scott-Sheldon, 2003; Kaaya et al., 2002;).

Health promotion programs have been found to be the most effective when developed and implemented in a systematic manner following a proper planning and evaluation model. Nowadays, the commonly used planning model is Intervention Mapping (Bartholomew, Parcel, Kok, & Gottlieb, 2006). Intervention Mapping (IM) is a framework that provides a systematic approach for the development of health education programs that are based on evidence and theory and it consists of six fundamental steps (see Figure 1). IM has been used in South Africa to create health promotion interventions (Draper et al., 2014; Aaro et al., 2014; Kolbe-Alexander et al., 2012). To our knowledge, there is no STI/HIV health education program designed for men who have undergone initiation and traditional male circumcision (ITMC).

ITMC is a cultural practice that has evolved over centuries in different parts of the world including South Africa. It is practiced as a rite of passage that marks the transition from boyhood to manhood in the Eastern Cape Province. During the rite of passage, young males are taught by men who have also undergone the same ITMC processes about appropriate sexual behaviours including the dangers of promiscuity, marriage, starting a family and taking responsibility within the community (Meissner & Buso, 2007; Vincent, 2008), which contributes to the development of ethnic identity. Ethnic identity has been described as the degree to which a person identifies with and is involved socially, politically, emotionally, behaviorally or spiritually in cultural beliefs and practices of one's racial/ethnic group (Langford et al., 2010; Saylor & Aries, 1999).

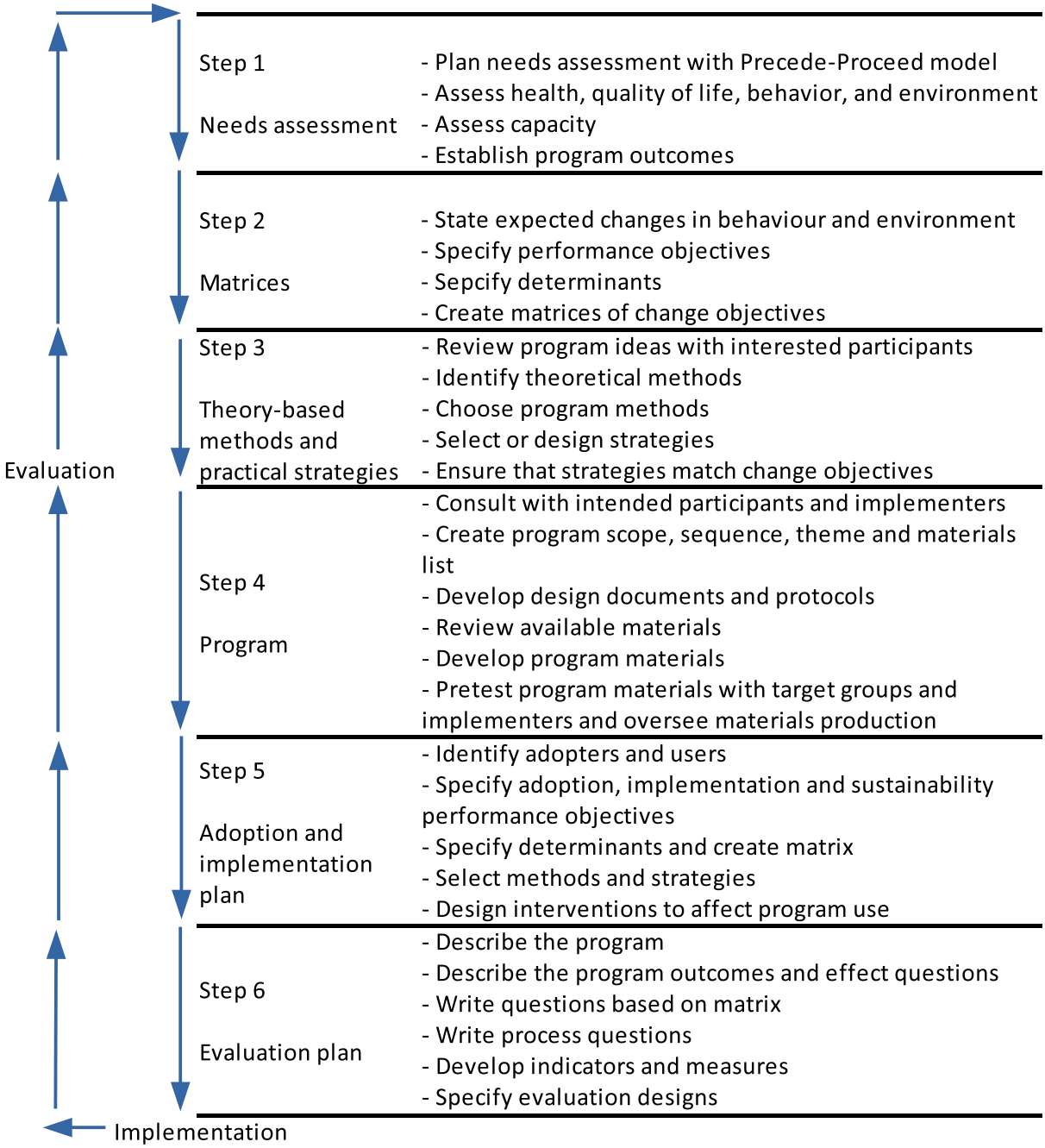
Aim

In this paper we describe the application of the IM in the development of an STI/HIV health education program, which can be integrated into the ITMC practices in the Eastern Cape Province of South Africa.

Step 1: Needs assessment

This step involves an analysis of the health problem, associated behavioural and environmental

Figure 1. Intervention Mapping Protocol



conditions, and determinants of these conditions for the population at risk. In this paper, we reviewed sexual behaviours that place traditionally circumcised men at risk of STIs/HIV. A cross-sectional study among initiates found that 79% of the participants were already sexually active before ITMC (Nyembezi at al., 2010). A study among traditionally circumcised men in Cape Town reported participants engaging concurrent sexual partnerships and unprotected sex (Eaton, et al., 2011). Nyembezi at al., (2012) study also showed that 41.4% of the participants were in concurrent sexual partnerships;

and the intention to reduce the number of sexual partners was associated with the intention to be a responsible man, attitudes towards gender based violence, attitudes towards sexual coercion, subjective norms towards gender based violence, subjective norms towards responsible man's family welfare, self-efficacy towards having one sexual partner and positive self-esteem. A cross-sectional study conducted by Nyembezi, Ruiter, et al. (2014) revealed that about 49% of the participants reported consistent condom use; which was positively associated with the knowledge of condoms, positive attitudes towards condom use with main and casual sexual partners, positive subjective norms towards condom use with the main sexual partner, perceived self-efficacy towards condom use, positive self-esteem, positive beliefs about male circumcision and STI protection, positive attitudes towards gender based violence and ethnic identity towards cultural alienation. In another study, participants who expressed high as opposed to low cultural affiliation were significantly more likely to use condoms consistently and correctly when having sex, especially if they reported to have more than one sexual partner (Nyembezi, Resnicow, et al., 2014). Low levels of HIV testing are not unusual among young men of South Africa. A study among traditionally circumcised men revealed that 35.1% tested for HIV, of those 46% reported inconsistent condom use; the intention to test for HIV was positively associated with the perceived probability of getting an STI, positive attitudes towards gender-

Figure 2. Proposed Matrix of change objectives for condom use behaviour among initiated and traditionally circumcised men in the Eastern Cape Province (continued)

Performance objectives	**Personal Determinants**					**External Determinants**
	Knowledge	**Attitudes**	**Perceived norms**	**Self-efficacy**	**Risk perception**	**Social support**
Plan high quality condom use (Government provided)	Describes the benefits of using quality condoms in preventing STI/HIV and pregnancy	Expresses feeling good for being prepared for condom use			Describes how lack of planning increase risks of STI/HIV and pregnancy	Supported by sexual partner in planning for condom use
Obtain good quality condoms	Identifies places where government provided condoms can be obtained	Expresses importance of obtaining good quality condoms		Expresses confidence in obtaining quality condoms		Sexual partner supports obtaining quality condoms
Check expiration date	Mentions that condoms deteriorate with time			Expresses confidence in checking condom expiration date before use	Recognises risks of use of bad quality condoms	
Always have quality condoms accessible	Lists effective places to keep condoms accessible and in good conditions				Describes why not having quality condoms is risky for STI/HIV and pregnancy	Sexual partner supports and checks availability of quality condoms

(continued)

Figure 2. Proposed Matrix of change objectives for condom use behaviour among initiated and traditionally circumcised men in the Eastern Cape Province (continued)

Performance objectives	Personal Determinants					External Determinants
	Knowledge	Attitudes	Perceived norms	Self-efficacy	Risk perception	Social support
Discuss benefits (prevention of STI/pregnancy) of using quality condoms with sexual partner and peers	Mentions importance that sexual partner and peers also understands benefits of using condoms					
Negotiate condom use with sexual partner	Lists steps on negotiating use of quality condoms	Recognises negotiating condom use as important for responsible man		Expresses confidence in negotiating condom use with sexual partner		Sexual partner reacts positively when discussing condom use
Demonstrate correct use of condoms	Names all steps in correct use of condoms	Recognises safe outcomes of correct use		Feels confident in showing correct condom use	Describes how incorrect condom use increase risks of STI/HIV and pregnancy	Sexual partner helps in correct use of condoms
Consistent condom use for every sexual encounter	Describes why correct condom use with every sexual contact is needed	Feels good towards using quality condom every time when having sex	Expects that sexual partner, peers and significant others want you to use condoms every time when you have sex	Feels confident in using quality condom with sexual partner every time when having sex	Mentions risks of inconsistent condom use	Sexual partner peers and significant others support decision of using quality condom every time when having sex

based violence, received general teachings about being a responsible man and highest grade passed (Nyembezi at al., 2013). This evidence provides justification for the development an STI/HIV health education program. Behavioural objectives should focus on promoting the delay of sexual intercourse, reducing multiple concurrent sexual partnerships, increasing consistent and correct condom use for those who are already sexually active and increasing HIV testing.

Step 2: Matrices

In this step, the problem-increasing behaviors and environmental conditions are transformed into problem-reducing behaviours and environmental conditions. This step requires a specification of objectives that include explicit descriptions of the targeted population's behaviour, performance objectives and the personal and external determinants of those behaviours. In this paper, we will provide an example of performance objectives for condom use. We developed a matrix by combining eight performance objectives for condom use and associated determinants to create change objectives (see Figure 2 for a proposed matrix).

Step 3: Methods and applications

In step 3, change objectives should be linked to

practical strategies derived from theoretical methods for behavioural change. A method is a general theory-based technique to accomplish change in behavioural determinants; a practical strategy is the specific application of a method, in such a way that it fits the targeted group and the intervention in context. In the last three decades, social cognitive theories have been developed to understand the determinants of health behaviours, among which the Theory of Planned Behaviour (Ajzen, 1991), Social Cognitive Theory (Bandura, 1986), and Protection Motivation Theory (Rippetoe & Rogers, 1987) are the most commonly used frameworks to explain health behaviour (for integrative approaches, see Fishbein et al., 2001; Montano & Kasprzyk, 2008). For example, the Theory of Planned Behavior proposes that individual behaviour is determined by intention. The strength of intention in turn is determined by attitude, subjective norms and self-efficacy.

Step 4: Program development

The product of step 4 is the actual development and delivery of the program on the basis of the preceding steps. The planners should specify the scope and sequence of the components as well as channels of delivery (interpersonal), delivery system (a lesson delivered during the ITMC processes), program materials and language. This program should be fully designed in close collaboration and consultation with the House of Traditional Leaders, health promoters, research institutions and popular opinion leaders such as chiefs, traditional surgeons, traditional guardians, initiates and men that have undergone the rite of passage, striving for cultural sensitivity. All components of the intervention should be pilot tested for effectiveness before final production and implementation.

Step 5: Adoption and implementation plan

This step requires the planner to delineate what decision makers need to do to assure program adoption and what individuals who are implementing the program need to do to assure reliable and appropriate implementation. The traditional guardians could be chosen as implementers of the program (i.e. teach messages aimed to promote consistent and correct condom use) because of the pivotal role they play in teaching traditionally circumcised men essential responsibilities and appropriate sexually behaviours. The best way to improve appropriate adaptation and implementation of the intervention would be working with a linkage system, collaborating with traditional guardiansfrom the start of the planning process. All the implementers should be trained. The program should be piloted to determine the feasibility and also to allow the implementers to gain experience.

Step 6: Evaluation plan

The objective of this step is to design an evaluation plan that focuses on process and effect of the program. Information from the previous steps can be used to develop questions and measurement instruments. The evaluation should be based on research methods and instruments that will be useful for examining the fidelity and completeness of the program implementation. It should also evaluate the impact on behavioural determinants, environmental conditions and quality of life outcomes. The team might decide to use mixed research methods such us in-depth interviews and survey among implementers and targeted groups to evaluate the program. The effectiveness of the program and implementation could be evaluated in a randomised control trial. One group can receive specific teaching and training on condom use whilst undergoing ITMC, while the other continues with the normal teachings taught to every traditionally circumcised man.

Conclusion

This paper highlights some important aspects about sexual behaviours that put young people at risk of STIs/HIV. As South Africa works to consolidate gains in STI/HIV prevention, it is vitally important that men who have been undergone ITMC are fully involved. We propose that the STI/HIV health education program development should be based on sound theoretical models, use an IM framework and be designed in collaboration with the various stakeholders.

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