

Male Circumcision for HIV Prevention: Predicting Behavioral Intention and Attitude

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Abstract

Following three landmark studies in South Africa, Kenya and Uganda that found male circumcision significantly reduced the risk of female-to-male transmission of HIV, researchers have argued that consideration should be given to the acceptability and feasibility of providing safe services for male circumcision as an HIV prevention strategy in areas of Africa where men are not traditionally circumcised. UNAIDS/WHO have recommended scaling up MC efforts and noted that it is critical that any scale up efforts include communication that is based on formative research. This study is an attempt to provide such research and uses the health belief model and the theory of reasoned action as the foundation for collecting data on Ugandan males' beliefs to explain their attitudes toward circumcision and intent to get circumcised. This study surveyed males residing in two slums in Kampala, Uganda, and found that respondents' intent to get circumcised was relatively high and their attitude towards circumcision was favorable. Results also showed that all the variables in the HBM and RAPB help to explain attitude and intent to get circumcised but that promotional efforts might want to emphasize true benefits.

Key words: male circumcision, Uganda, formative research, Health Belief Model, Theory of Reasoned Action and Planned Behavior

Introduction

This paper presents the results of a study that examines the relationships between attitude toward male circumcision (MC) and intent to get circumcised and

1. Behavioural beliefs, evaluation of behavioural outcomes, normative beliefs, motivation to comply, control beliefs and perceived power (Health Belief Model)
2. Perceived susceptibility, severity, benefits and barriers, as well as self-efficacy and cues to action (Reasoned Action and Planned Behavior Model)

The significance of the study lies in the fact that it provides both a theoretical and empirical basis for future promotional efforts to promote adoption of male circumcision. More specifically, the results of this formative research will be used to develop an intervention for use in the communities where this research was conducted. Additionally, for those working in the same general geographical area, the results could provide some guidelines for planning their interventions. Finally, HIV is a disease with significant effect on the lives of people, particularly in

Africa, and the findings about male circumcision as a preventive measure were globally welcomed and considered a major breakthrough.

Discovery of Male Circumcision as an HIV Preventive Measure

In 2000, Weiss, Quigley and Hayes published their meta-analytic examination of studies published up to April 1999 on male circumcision and the risk of HIV-1 infection in men in sub-Saharan Africa. They found that male circumcision was associated with a significantly reduced risk of HIV infection among men in sub-Saharan Africa, particularly those at high risk of HIV. The researchers argued that consideration should be given to the acceptability and feasibility of providing safe services for male circumcision as an HIV prevention strategy in areas of Africa where men are not traditionally circumcised.

A Cochrane review followed in 2003 meta-analyzing existing observational studies comparing acquisition rates of HIV-1 and HIV-2 infection in circumcised and uncircumcised heterosexual men and reported that there was "insufficient evidence to support an interventional effect of male circumcision on HIV acquisition in heterosexual men," however, that "the results from existing observational studies show a strong

epidemiological association between male circumcision and prevention of HIV, especially among high-risk groups" (Siegfried et al., 2003, p. 2). In addition, the authors noted that "observational studies are inherently limited by confounding which is unlikely to be fully adjusted for" (p. 2). It is important to note, however, that the authors did not include any randomized controlled trials (RCT) in the meta-analysis, as they noted that "three randomized controlled trials [were] currently underway or commencing shortly." The authors wrote that, "in the light of forthcoming results from RCTs, the value of IPD analysis of the included studies is doubtful" and these studies would need to be "carefully considered before circumcision is implemented as a public health intervention for prevention of sexually transmitted HIV" (p. 2).

The three RCTs in South Africa, Kenya and Uganda indicated that male circumcision significantly reduced the risk of female-to-male transmission of HIV. Auvert et al. (2005) conducted an RCT intervention trial on 3, 274 uncircumcised men ages 18 to 24 in South Africa and suggested that male circumcision may provide protection against HIV-1 infection. They noted that male circumcision provides a degree of protection against acquiring HIV that is equivalent to what a vaccine of high efficacy would have achieved, therefore making it an important means of reducing the spread of HIV infection in sub-Saharan Africa. When controlling for behavioral factors, including sexual behavior that increased slightly in the intervention group, condom use, and health-seeking behavior, male circumcision had a protective effect of 61% against HIV.

Bailey et al. (2007) conducted an RCT on 2,784 men ages 18 to 24 in Kisumu, Kenya, and found similar results, reporting that male circumcision significantly reduces the risk of HIV acquisition in young men in Africa with a protective effect of 60%. Gray et al. (2007) also reported a protective effect of circumcision, reporting an estimated efficacy of intervention at 51%, based on an RCT on 4,996 uncircumcised, HIV-negative men ages 15 to 49 in rural Rakai district, Uganda. Both the Kenya (Bailey et al., 2007) and Uganda (Gray et al., 2007) studies were halted early when the evidence vastly supported protective benefits of male circumcision.

Following the completion of the three RCT studies, Weiss et al. (2008) performed a random effects meta-analysis on the results of these trials and reported a cumulative protective effect of 58%. The Cochrane Collaboration conducted a second meta-analysis and reversed the 2003 review's findings, concluding that "research on the effectiveness of male circumcision for preventing HIV acquisition in heterosexual men is complete. No further trials are required to establish this fact" (Siegfried et al., 2009). Similarly, based on a literature review, Doyle et al. (2010) concluded that "delivery of safe circumcision services where HIV prevalence is high and MC prevalence is low could save millions of lives and billions of dollars during the next 20 years" (p. 25).

The results of the three studies lead to calls for interventions. After a meta-analysis, Westercamp and Bailey (2007) concluded that because acceptability of male circumcision was quite consistent and good to high, additional acceptability studies were unnecessary and it was time for action. Baeten et al. (2009) suggested that these results should be seen as opportunities to craft "enhanced messaging about [male] circumcision" (p. 183). The criticality of communication per se in social justice arenas is not always recognized (The Rome Consensus, 2007); practitioners "subjectize the issue (i.e., "medicalize" HIV, or "engineerize" flood preparedness). But gauging knowledge, beliefs and attitudes, assessing familial and societal values, understanding cultural strengths and barriers, and using this information to design careful, clear, and comprehensive, as well as targeted, indigenously fashioned messages are imperative for public uptake of MC (Gostin & Hankins, 2008; Howson, 2006; UNAIDS, 2007). UNAIDS/WHO recommended scaling up MC efforts. It is critical that any scale up effort include messaging that is founded on formative research. This study is an attempt to provide such research.

It is also critical that male circumcision efforts be part of a comprehensive prevention package. According to UNAIDS (2007), the relationship between circumcision and HIV transmission is complex, and caution is required. While MC provides a relatively high probability of curtailing infection, it is still a probability. Thus, MC provides only partial protection (Johnson & Quinn, 2008). Further, there is the possibility of "disinhibition; feeling safe, circumcised men may engage in risky behavior. Also, circumcised men may not abstain long enough to heal, increasing the risk of infection (Kigozi et al., 2008). And, "People are used to policies that target behaviors, but circumcision is a surgical intervention—it's cold, hard steel—and that doesn't always go down well" (Katz & Wright, p. 2415). Fear of the procedure has been found to be a major inhibitor (Westercamp & Bailey, 2007).

The HIV/AIDS Epidemic

Entering its fourth decade, the global AIDS epidemic appears to have steadied with the annual number of new HIV infections steadily declining since the peak in 1999 (UNAIDS, 2010). Worldwide, the number of AIDS-related deaths and new HIV infections have decreased by 19%, and the number of people receiving HIV antiretroviral therapy has grown 13-fold to more than 5 million (UNAIDS, 2010). Although the number of new infections is decreasing, levels of new infections overall are still high, and because there have been significant decreases in AIDS-related deaths, the number of people living with AIDS has increased (UNAIDS, 2010).

In 33 countries, new HIV infections decreased by more than 25% between 2001 and 2009, with 22 of these countries located in sub-Saharan Africa (UNAIDS, 2010). Still, the majority of new HIV infections continue to occur in sub-Saharan Africa, where an estimated 1.8 million people became infected in 2009; however, this is a considerable decrease from the estimated 2.2 million infected in 2001. This reduction in new infections can be explained by several factors, including the impact of HIV prevention efforts and the natural course of the HIV epidemic

(UNAIDS, 2010).

Several regions, however, do not reflect this trend and show an HIV incidence increase of more than 25% between 2001 and 2009. This may be due to a resurgence of HIV in several high-income countries among men who have sex; additionally, in Eastern Europe and Central Asia, high rates of HIV transmission have been connected to networks of people who inject drugs and their sexual partners (UNAIDS, 2010). Interestingly, although there have been decreases both in the number of adults and children newly infected with HIV and the number of AIDS-related deaths in sub-Saharan Africa from 2001-2009, in the Middle East and North Africa in the same time period the number of new HIV infections has more than doubled and the number of AIDS-related deaths has nearly tripled (UNAIDS, 2010). At the same time, several regions show stability in the number of new annual HIV infections, including Western, Central and Eastern Europe, Central Asia and North America.

Status of the HIV/AIDS Epidemic in Uganda

The HIV epidemic in the Republic of Uganda has a prevalence of 6.4% among adults and 0.7% among children; of the 30 million people who live in Uganda, approximately 1.1 million people are HIV-infected (UNGASS, 2010). The incidence rate far exceeds AIDS-related deaths and the number of people enrolling into chronic AIDS care. There has been a shift in new and old infections from younger to older age groups and from people in single casual relationships to those in long-term stable relationships. Women, urban dwellers and residents of the post-conflict northern Uganda region are also more disproportionately affected. Both the incidence and prevalence of Uganda's HIV epidemic stopped declining around 2000, remaining more or less stable.

It is estimated that more than 100,000 new HIV infections occur annually in Uganda, with sexual transmission contributing to 76% of new HIV infections and mother-to-child transmission contributing to 22% (UNGASS, 2010). There is also evidence of reversals in uptake and practice of preventive sexual behavior in the general population, specifically among adults and men.

Despite these findings, Uganda has confirmed its commitment to Universal Access (UA) to HIV and AIDS prevention, care and treatment in line with WHO/UNAIDS recommendations (UNGASS, 2010). In recent years, the country has intensified efforts to put vitality back into HIV prevention and has developed and adopted a road map toward accelerated HIV prevention based on the current drivers of the HIV epidemic within the country (UNGASS, 2010). Initiatives implementing comprehensive, evidence-based HIV prevention interventions on a scale commensurate with UNGASS and UA targets are outlined in Uganda's National HIV&AIDS Strategic Plan (2007/2008 – 2011/2012) and the second Health Sector Strategic Plan 2005-2010.

HIV Prevention Efforts

With the global incidence of HIV infection declining by 19% from 1999 (the year of peak incidence) to 2009, dedicated efforts to promote and support combination HIV prevention are producing clear and effective results (UNAIDS, 2010). Opportunities to improve HIV prevention knowledge and behavior are flourishing, and evidence for combination HIV prevention efforts changing the course of the epidemic continues to grow (UNAIDS, 2010).

Several structural approaches implementing social change have been reported to reduce HIV risk (UNAIDS, 2010). Those found to have a potentially significant influence on HIV risk and vulnerability include: decreasing the violence faced by people who inject drugs; combining microfinance for women with gender training and community mobilization; schooling for girls; decreasing food insecurity; and strengthening solidarity and collective action among members of marginalized groups, among others.

HIV prevention efforts continue to emphasize increasing knowledge and behavior change – goals that were set at the United Nations General Assembly Special Session on HIV/AIDS (UNGASS) in 2001. Increased correct knowledge has also been found to reduce HIV incidence and prevalence in most countries with high HIV prevalence. In 2010, UNAIDS reported that HIV prevention investments are 22% of all AIDS spending in 106 low- and middle-income countries and cited behavior change as the most important factor accounting for the declines in new HIV infections in many countries. Among young people, increased condom use, delayed sexual debut and reductions in multiple partnerships have been associated with noteworthy drops in HIV incidence. When these key behavioral indicators related to the risk of HIV infection all have positive trends, the incidence of HIV infection is substantially reduced.

Since 2001, however, "major advances in HIV prevention tools and methods have been integrated progressively into increasingly effective HIV prevention programmes" (UNAIDS, 2010, p. 80), including efforts to prevent mother-to-child transmission and to promote male circumcision. Up and coming efforts include increasing access to antiretroviral therapy, utilizing antiretroviral drugs topically in microbicides and increasing the prophylactic use of antiretroviral drugs before exposure to HIV.

Resource availability for AIDS efforts has always fallen short of what is needed, requiring national programs to ensure that program choices are effective and efficient to have the maximum impact in preventing new HIV infections and AIDS-related deaths (UNAIDS, 2010). Countries have experienced the most positive results when resources are "tailored to epidemic patterns and have followed evidence," such as treatment programs that use the most effective combination of drugs and male circumcision as a priority component of prevention in generalized epidemics (UNAIDS, 2010, p.152).

Male Circumcision as an HIV Prevention Tool

Discussion of an association between HIV infection and male circumcision practices first appeared in medical literature in 1986 (e.g., Fink, 1986; Alcena, 1986). Since then, several epidemiological studies have also linked circumcision and HIV infection, and more recently,

three RCT studies (mentioned above) reported that adult male circumcision significantly reduces the likelihood of uninfected men contracting HIV from an HIV-infected female sex partner. Following the results of these three largely cited studies, WHO and UNAIDS (2007) issued a joint recommendation that “male circumcision should now be recognized as an efficacious intervention for HIV prevention” and “promoting male circumcision should be recognized as an additional, important strategy for the prevention of heterosexually acquired HIV infection in men” (p. 3).

Interestingly, in Africa, mapping of HIV prevalence and male circumcision indicates considerable overlap: HIV prevalence is highest where male circumcision is not common (Siegfried et al., 2005; Quinn et al., 2000; Katz & Wright, 2008). These are precisely the areas where impact will be greatest. If male circumcision interventions were implemented in sub-Saharan Africa, they could prevent about 5.7 million new HIV cases and 3 million deaths in the next 20 years (Male circumcision, 2007). Men in stable discordant relationships (man is HIV negative, female partner is HIV positive) might particularly benefit from MC (UNAIDS, 2007), especially if they want to begin a family (Male circumcision, 2007).

Upon reviewing nine country experiences of scaling up adult male circumcision in Southern and Eastern Africa, UNAIDS (2010) reported significant roll-out of male circumcision efforts in the Nyanza province of Kenya and substantial experience in other areas, including Uganda, which cited 5,340 circumcisions taking place from October 2008 to March 2010.

Criticism of Male Circumcision as an HIV Preventive Measure

Roll-out efforts, however, have not been without criticism, specifically those taking place in South Africa. Ncayiyana (2011) criticized scaling-up male circumcision efforts in South Africa, arguing that circumcision is more expensive, more invasive and less effective by itself in preventing the transmission of HIV/AIDS when compared to using latex condoms – a prevention tool described by UNFPA, WHO and UNAIDS (2009) as “the single most efficient, available technology to reduce the sexual transmission of HIV and other sexually transmitted infections” (n.p.). “Circumcision roll-out will divert scarce resources in money, human resources and infrastructure away from essential health services, in a system that is already severely under-provided,” (Ncayiyana, 2011, p. 775).

Similarly, Van Howe and Storms (2011) pointed out “several fundamental flaws” (p. 11) of male circumcision as a preventive measure, arguing that it takes resources away from “more effective, less expensive, less invasive alternatives” and that by “diverting attention away from more effective interventions, circumcision programs will likely increase the number of HIV infections” (p. 11).

Similarly, in 2007, the Australian Federation of AIDS Organizations reported that “correct and consistent condom use, not circumcision, is the most effective means of reducing female-to-male transmission” (p. 1). Van Howe and Storms suggested that using male circumcision as a solution may lead to risk compensation. Sidler, Smith and Rode (2008) indicated that “the use of mass circumcision to curb HIV in Africa is ill-advised, and may worsen the crisis while expending scarce resources that could be applied better for more effective preventive measures” and further that male circumcision efforts may even increase the risk of HIV by “creating a false sense of security and protection and therefore undermining safe sex practices and condom usage among men and their partners” (p. 763). While recognizing the beneficial effects of male circumcision, some researchers were concerned about whether circumcision can be provided safely to large numbers of adult men in developing countries. Bailey et al. (2008) reported that 35% of traditional circumcisions studied resulted in adverse events, with many of them being serious and permanent, and thus that “extensive training and resources will be necessary to build the capacity of health facilities in sub-Saharan Africa before safe circumcision services can be aggressively promoted for HIV prevention” (p. 675).

Criticisms are also tied to the three RCT studies themselves. Critics argue that without field-testing, the applicability and repeatability of the RCT studies cannot be predicted in real-world settings (Ncayiyana, 2011). They also point out that two of the studies were terminated early to offer circumcision to control groups, removing opportunities for long-term follow up; recent data from a long-term follow-up of the Kenyan study, however, refute this claim (Bailey et al., 2008). Some critics (e.g., Ncayiyana, 2011; Van Howe & Storms, 2011) pointed out a lack of epidemiological evidence, citing a South African demographic survey, which reported that there was no association between HIV and circumcision (roughly 12.3% each of circumcised and intact men were HIV-positive) (Connolly et al., 2008). In addition, Van Howe and Storms (2011) reported that among developed nations, the United States has the highest rate of (largely neonatal) circumcision and the highest rate of heterosexually transmitted HIV, also arguing that there is no distinct pattern pertaining to circumcision and HIV infection. Also cited as criticisms were the lack of biological plausibility showing that cutting off the foreskin prevents the transmission of HIV and the lack of knowledge about which infections were sexually transmitted in the three RCTs (Van Howe & Storms, 2011).

Health Belief Model (HBM)

The Health Belief Model (HBM) model is a widely used theoretical framework for health behavior studies and interventions. A total of 64% of all studies in the Medline database between 1974 and 1994 used the HBM as the main theoretical framework (Clarke et al., 2000, p. 369). This makes it by far the most frequently used theoretical framework in health education and health promotion (Glanz, Rimer & Lewis, 2002). HBM “has been used both to explain the change and maintenance of health-related behaviors and as a framework to guide health behavior

interventions" (Rosenstock, 2000, p. 79).

The HBM evolved over time and became a theory aiming to explain why the public accepts (or rather rejects) healthcare programs. The foundational ideas for the HBM, a cognitive theory that places value on thinking and anticipating, date back to the 1950s when researchers were surprised and concerned by the public's failure to make use of health care offers. The HBM is part of the value-expectancy theory, wherein a person's behavior depends on the subjective value of an outcome, as well as on the subjective expectation that a certain action will lead to that outcome (Rosenstock, 2000; Lewin, Dembo, Festinger, & Sears, 1944). Thus, a person will adopt a certain behavior (the dependent variable) only through manipulation of expectations (independent variables) (Bandura, 1977). The theory evolved to include more than just the independent variable of expectations or value of the outcome (i.e., the benefits); thus, in its evolved form, HBM theorized that likelihood of adopting a behavior depended on *perceived benefits* and *perceived barriers*, *perceived severity of* and *perceived susceptibility to* the health issue, and modifying factors such as *cues to action* and *demographic variables* (Kim, 1991), and sometimes *self-efficacy*. In addition, for this study, an additional dependent variable, attitude toward the behavior, was included because the hierarchy of effects model, used often in behavior adoption models of consumer behavior, posits that beliefs influence attitude, which in turn influences behavior (Smith, Chen & Yang, 2008).

Perceived benefits refer to beliefs about the effectiveness of the available treatments. They can be objective facts, as well as subjective beliefs about the effectiveness of the counter-acting behavior in dealing with the disease. On the other hand, perceived barriers are circumstances that impede adopting the counter-acting behavior. Typically such barriers are pain, cost, inconvenience or embarrassment (Rosenstock, 2000; Clarke et al., 2000) and some researchers believe they have the largest influence on adoption of the behavior (Janz & Becker, 1984).

Perceived susceptibility is the individual's perception of his or her risk of getting the disease. While susceptibility is generally underestimated by the general population, some consider it the most powerful motivator to engage in health-promoting behavior (Rosenstock, 2000; Clarke et al., 2000;

Chen et al., 2007; Belcher et al., 2005). This is not always the case, however. In Lewis and Malow's 1997 study of college students who perceived themselves at high risk for HIV because they did not use contraception, the students did not adopt preventive behavior (Lewis & Malow, 1997). Perceived severity refers to the subjective evaluation of the consequences of a disease in terms of morbidity and mortality associated with the disease. Perceived severity may reference the subject's actual medical knowledge or the myths and beliefs held by the subject about the disease.

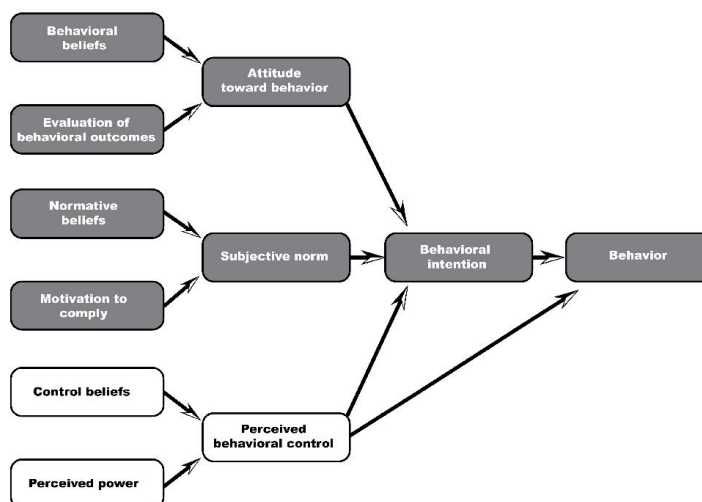
Cues to action are events, people, or actions that trigger the recommended behavior, and can range from an occurrence such as a sneeze to an outside stimulus, such as recommendations from physicians or family members (Rosenstock, 2000; Clarke et al., 2000). Self-efficacy is oftentimes included in the HBM, especially in studies that require the person to acquire a certain skill (e.g., breast self-examination), and refers to a person's belief in their ability to engage in the behavior (Rosenstock, 2000; Bandura, 1977).

Many people are unrealistically optimistic about their susceptibility to and the severity of the disease ;"people perceive their own personal outcomes as being more positive than those of other people in similar circumstances" (Clarke et al., 2000, p. 368). When this perceptions present among a large number of people, it is called unrealistic optimism (Clarke et al., 2000). However, when susceptibility is recognized, very often the relationship between susceptibility and action is very strong (Janz & Becker, 1984). On the other hand, the relationship between perceived severity and action is curvilinear, depending on the individual's style of coping, such that after a point, the larger the perceived severity, the less the adoption of the action (Pargament et al., 1988).

Theory of Reasoned Action and Planned Behavior (RAPB)

The RAPB theory also relates cognitions to behavior; it explains behavior from behavioral intention, which in turn is explained by attitudes toward the behavior, subjective norms and perceived behavioral control (Figure 1). The exact nature of the relationships between the elements of the RAPB is explained only vaguely (Ajzen, 1991). Still, "since its introduction 26 years ago (Ajzen, 1985), the theory of planned behavior [...] has, by any objective measure, become one of the most frequently cited and influential models for the prediction of human social behavior" (Ajzen, 2011, p. 1113).

Figure 1 Theory of Reasoned Action and Planned Behavior



Source: McNeil, n.d.

The theory of reasoned action (not inclusive of planned behavior) was the original model and did not include perceived behavioral control. It predicted behavior from intentions, which in turn were explained by attitudes and subjective norms. Attitudes refer to evaluations by the individual about how good/bad a certain behavior would be for them. Subjective norms are societal pressures to engage or not engage in a behavior. However, this theory did not take into account that some behaviors are not fully under the control of individuals and require resources (such as time, money, skills, etc.), opportunities or other people's cooperation (Sheeran & Orbell, 2000; Ajzen, 1991), and, thus, could not explain variability in behaviors over which people do not have complete volitional control.

To account for this gap, Ajzen (1985) extended the model formulating the theory of planned behavior. The combined model of reasoned action and planned behavior therefore includes behavioral control, i.e., people's assessment about whether or not they are able to perform the behavior and how easy or difficult it would be for them to do so (based on opportunities/resources available as applicable). This is the distinguishing factor between the original and revised model (Sheeran & Orbell, 2000; Ajzen, 1991). Behavioral control is most comparable to Bandura's concept of perceived self-efficacy (Bandura, 1977; Bandura, Adams, & Beyer, 1977; Bandura et al., 1980).

Ajzen's (1991) argument for this inclusion of behavioral control (as the Theory of Planned Behavior, i.e., TPB) is as follows: If intention is controlled, the effort made to adopt a certain behavior is likely to increase if perceived behavioral control increases. For example, he says, if two persons

equally motivated to learn to ski (behavioral intention) try to do so, the person with more behavioral control is more likely to persevere than the person with less behavioral control. "At its core, the TPB is concerned with the prediction of intentions. Behavioural, normative and control beliefs, as well as attitudes, subjective norms and perceptions of behavioural control are assumed to feed into and explain behavioural intentions. Whether intentions predict behavior depends in part on factors beyond the individual's control, i.e. the strength of the intention-behaviour relation is moderated by actual control over the behaviour" (Ajzen, 2011, p. 1115).

This model has repeatedly been supported in correlational surveys and has two major strengths: its parsimony and its clear guidelines on how to measure cognitions in order to ensure predictive accuracy (Ajzen & Fishbein, 1980).

In some depictions and discussions of the RAPB, behavioral control has both an indirect (through behavioral intention) and direct relationship with behavior, indicating that the variance in behavior may also be directly predicted from intentions and behavioral control apart from the indirect influence of behavioral control on behavior, through behavioral intention (Figure 2).

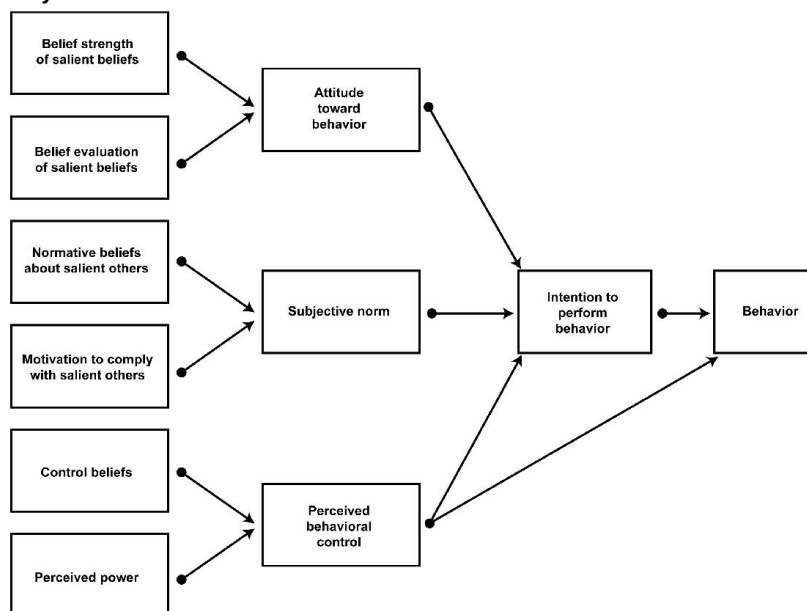
Using the logic of the hierarchy of effects model, extensively used in predicting consumer behavior, overall attitude (as distinct from the behavioral attitude in the RAPB) was added as a dependent variable.

The theory of planned behavior and reasoned action, despite its application to a variety of issues and repeated confirmation through empirical data, has been criticized for not explaining behavioral change and underestimating the effect of past behavior or habit. Furthermore, the theory of RAPB does not include cultural, personality and demographic variables, which also influence attitudes, intentions, and behavior, and does not account for irrational thoughts and fears, which can be very

influential for taboo topics (Sharma, M. & Kanekar, 2007; Yousafzai, Foxall & Pallister, 2010). Finally, relatively little research has been done to discover

additional predictive factors that account for the remaining variance to explain people's intentions and behaviors (Sheeran & Orbell, 2000).

Figure 2 Theory of Reasoned Action and Planned Behavior



Source: Frymier & Nadler 2013, 166.

In summary, for HBM, the higher the perceived susceptibility, perceived disease severity, perceived benefits, perceived self efficacy and cues to action, and the lower the perceived barriers, the more favorable the attitude towards the behavior and the greater the intent to adopt the behavior. For RAPB, the higher the behavioral beliefs and the more favorable the evaluation of the behavioral outcome, the higher the normative beliefs and motivation to comply, and the higher the control beliefs and perceived power, the greater the behavioral intent; and further, the greater the behavioral intent and the control beliefs/perceived power, the higher the likelihood of adopting the behavior.

Method

The study commenced only after Institutional Review Boards in the United States and in Uganda granted permission. The survey method was used to conduct the formative research. The study's population was males (gender was mistakenly coded as female in one case) residing in two slums in Kampala, Uganda. One each of two research assistants went to the two slums, found a street or a lane with a row of houses and picked every fifth house for screening purposes. If the fifth home did not have a male, the research assistants moved on to the sixth house in the row and then continued on to every fifth household. If the household had more than one male, the interviewee was selected randomly. Before

the interview, the selected males were handed the informed consent form to read; if they agreed to participate in the study they were requested to provide signed consent. Altogether, 246 households were screened to get a total of 100 respondents. The respondents ranged from 18 to 49 years in age; one respondent who was less than 18 years old was removed, leaving a sample of 99.

The data collection instrument was a questionnaire in English, a language commonly spoken and understood in Uganda, a former British colony. The questionnaire was developed after a comprehensive reading of the literature on theories of behavior change, with a focus on the HBM and the RAPB. The questionnaire collected demographic data (age, education, and tribe), followed by data on variables from the two theories. While explaining/predicting behavior change or behavior adoption through behavioral intervention is the goal of both the HBM and RAPB, this study focused on behavioral intention (and attitude) as the dependent variables because measuring behavior because would require long-term follow-up. Behavioral intention was measured using two items (Cronbach's alpha = .639) as was attitude toward male circumcision (Cronbach's alpha = .518).

The independent variables for the HBM were measured as follows:

1. Perceived susceptibility ("I am at risk for getting HIV/AIDS.")
2. Perceived severity ("HIV/AIDS is an extremely harmful disease")
3. Perceived benefits
 - I. True benefits (three items using factual beliefs,

e.g., MC lowers the chance of getting HIV; Cronbach's alpha = .715)

II. Mythical benefits (two items, e.g., circumcised men enjoy sex more; Cronbach's alpha = .757)

1. Perceived barriers (five items about pain, stigma, safety, risky sexual behavior and putting women at risk; Cronbach's alpha = .608)
2. Self efficacy (two items about courage for and not being afraid of surgery; Cronbach's alpha = .767)
3. Cues to action (seven items about information sources, access to hospitals, and family support; Cronbach's alpha = .672)

The independent variables for RAPB were measured as follows:

1. Attitude towards behavior which includes two components
 - a. Behavioral beliefs comprising true benefits (measured by three items; Cronbach's alpha = .715) and mythical benefits (measured by two items; Cronbach's alpha = .757) of MC (both identical to HBM)
 - b. Evaluation of behavioral outcomes ("It is a good thing for me to reduce my chance of HIV infection by getting myself circumcised")
2. Subjective Norm which includes two components
 - a. Normative beliefs comprising
 - i. Injunctive beliefs (four items about what important others believe respondent should do about MC; Cronbach's alpha = .866) and
 - ii. Descriptive beliefs (four items about what important others plan to do about MC; Cronbach's alpha = .884)
 - b. Motivation to comply (four items about how much the respondent cared about the opinion of important others; Cronbach's alpha = .665).
3. Perceived Behavioral Control which includes two components
 - a. Control beliefs (identical to self efficacy in HBM; Cronbach's alpha = .767)
 - b. Perceived power (two measures on ability to abstain from sex to heal; Cronbach's alpha = .451)

For both theoretical models, benefits were divided into true and mythical because several myths exist about male circumcision and the relationship of these beliefs to attitude and behavioral intention need

to be teased out. Not all reliabilities were above the required standard of .70. Reliabilities for true and mythical perceived benefits, self efficacy, and injunctive and descriptive beliefs were above .70 and thus acceptable. All variables were however used in the analysis to fully test HBM and RAPB.

Hypotheses

The hypotheses were derived directly from the two theories, each using two dependent variables.

H1. A positive relationship exists between intent to adopt male circumcision and perceived susceptibility, severity, benefits, and barriers, as well as self efficacy and cues to action.

H2. A positive relationship exists between attitude towards male circumcision and perceived susceptibility, severity, benefits, and barriers, as well as self efficacy and cues to action.

H3. A positive relationship exists between intent to adopt male circumcision and behavioral beliefs, evaluation of behavioral outcomes, normative beliefs, motivation to comply, control beliefs, and perceived power.

H4. A positive relationship exists between attitude towards male circumcision and behavioral beliefs, evaluation of behavioral outcomes, normative beliefs, motivation to comply, control beliefs, and perceived power.

Findings

A large majority of the sample had a secondary school and higher education. Mean age of the respondents was 28.59 years.

For the HBM model, means of the independent (predictor) variables were as follows: susceptibility--3.17 (respondents likely had unrealistic optimism); severity--4.59 (had high awareness of disease severity); true benefits--3.94 and mythical benefits--3.12 (had greater recognition of true benefits); barriers--3.0 (composite of pain, stigma, safety, risky sexual behavior, and putting women at risk), with only pain ($M= 4.14$) and putting women at risk (3.13) emerging as barriers (i.e., had means above the midpoint of 3); self efficacy--3.23 (had a rather small measure of courage to undergo surgery); and cues to action--3.67 (had a fair stock of cues to action).

Mean behavioral intent was 4 indicating a high intention to get circumcised. Hypothesis 1 outlined a positive relationship between intent to get circumcised and the above HBM variables. The hypothesis was supported ($F = 2.723, p. <.05$) (Table 1) with the independent variables explaining 12.1 percent of the variance together (shared) even though none of the variables made a significant unique contribution.

Table 1 Regression of Independent Variables from the Health Belief Model on Behavioral Intention towards Male Circumcision

Multiple R: .436
R square .190
Adjusted R square: .121
Standard Error: .90

F value: 2.723; p = .014

	df	Sum of Squares	Mean Square
Regression	7	15.566	2.224
Residual	81	94.850	.545

Variable	B	SE B	β	t	Sig. t	(sr ²)
Constant	2.673	1.031		2.593	.011	
Risk	.048	.074	.066	.647	.520	n.s.
Severity	-.007	.096	-.008	-.069	.945	n.s.
True Perceived Benefits	.149	.155	.136	.961	.339	n.s.
Mythical Perceived Benefits	.052	.099	.066	.529	.598	n.s.
Perceived Barriers	-.194	.159	-.157	-1.214	.228	n.s.
Self Efficacy	.014	.098	.018	.147	.883	n.s.
Cues to Action	.277	.176	.188	1.575	.119	n.s.

Mean attitude was 3.9 indicating a favorable attitude towards circumcision. Hypothesis 2 outlined a positive relationship between attitude towards male circumcision and the above HBM variables. The hypothesis was supported ($F = 16.007, p < .05$) (Table 2), with the independent variables explaining 54.7 percent of the variance together. Of this 54.7

percent, 45.2 percent was shared by the independent variables, and 9.5 percent was explained by two variables: true perceived benefits) and mythical (3.6 percent) perceived benefits made significant unique contributions of 5.9 and 3.6 percent respectively to explain attitude. Thus, the higher the belief in benefits (both true and mythical), the more favorable was the attitude towards male circumcision,

Table 2 Regression of Independent Variables from the Health Belief Model on Attitude towards Male Circumcision

Multiple R: .764
R square .583
Adjusted R square: .547
Standard Error: .61

F value: 16.007; p = .000

	df	Sum of Squares	Mean Square
Regression	7	42.138	6.020
Residual	81	30.086	.376

Variable	B	SE B	β	t	Sig. t	(sr ²)
Constant	1.237	.707		1.749	.084	
Risk	-.033	.051	-.049	1.660	.511	n.s.
Severity	.108	.065	.132	1.655	.102	n.s.
True Perceived Benefits	.356	.106	.344	3.361	.001	.059
Mythical Perceived Benefits	.176	.067	.239	2.619	.011	.036
Perceived Barriers	-.209	.109	-.181	1.922	.058	n.s.
Self Efficacy	.108	.067	.145	1.615	.110	n.s.
Cues to Action	.160	.120	.114	1.328	.188	n.s.

For the RAPB model, means for the independent variables were as follows: evaluation of behavioral outcome --3.66 (respondents moderately agreed that getting circumcised would lead to a good outcome); injunctive beliefs — 3.16 (somewhat agreed that people important to them wanted respondents to get circumcised); descriptive beliefs — 2.94 (somewhat disagreed that people important to them were planning to get circumcised); motivation to comply (with these important others)—3.42 (had

moderately high motivation to comply); and perceived power--4.14 (had high belief in their power to abstain from sex to heal from surgery).

Mean behavioral intent was 4 indicating a high intention to get circumcised. Hypothesis 3 outlined a positive relationship between intent to get circumcised and the above RAPB variables. The hypothesis was supported ($F = 2.866, p < .05$). The independent variables explained 14.4 percent of the variance, of which 9.9 percent was shared by the independent variables and 4.5 percent was explained uniquely by perceived power (the higher the

perceived power to abstain from sex to heal from surgery, the greater the intent to get circumcised.

Mean attitude was 3.9 indicating a favorable attitude towards circumcision. Hypothesis 4 outlined a positive relationship between attitude towards male circumcision and the above RAPB variables. The hypothesis was supported ($F = 15.85, p < .05$). The independent variables explained 57.7 percent of the variance, of which 48.5 percent was shared, 5.3 percent was uniquely explained by true perceived benefits and 3.7 percent by injunctive normative beliefs (the higher the perceived true benefits and the higher the injunctive beliefs—about important others wanting them to get circumcised, the more favorable the attitude towards circumcision).

Summary and Conclusions

Respondents' intent to get circumcised ($M=4.0$) was relatively high and their attitude toward circumcision ($M=3.9$) was favorable. While respondents had moderate agreement with the true benefits of circumcision ($M=3.94$) and had a moderate level of cues to action (information, access and support) ($M=3.67$), and had considerable perceived power (to abstain long enough to heal) ($M=4.14$), they did not believe they were highly susceptible to the disease ($M=3.17$) and believed that they were only somewhat self efficacious ($M=3.23$). Further, pain was a high barrier ($M = 4.14$) and respondents only somewhat believed that important others wanted them to get circumcised ($M = 3.16$) and did not believe that these important others were planning to get circumcised ($M = 2.96$).

Both theoretical models were successful in explaining intent to behave and attitude; i.e., the independent variables together made a shared contribution to explaining the dependent variables.

Considering the dependent variable attitude specifically, for HBM, true and mythical benefits and for RAPB true benefits emerged from the cluster of independent variables to make a significant unique contribution to explaining attitude. Most practical advice on promotional campaigns suggests that it is critical to emphasize benefits to impact attitudes and behavior, and the results of this study bear this out. For the RAPB, injunctive beliefs (i.e., respondents' perception of other important people/community's beliefs about the respondent getting circumcised) also emerged to uniquely explain attitude; this is an important variable in collectivistic societies such as Uganda and needs to be considered in promotional efforts in such societies.

Considering the dependent variable behavioral intent specifically, for HBM, no independent variable emerged to uniquely explain intent; this however does not reduce the importance of the significant support for the hypothesis because intent is explained by a combination of the independent variables in the HBM. For RAPB, perceived power emerged from the cluster of variables to make a unique contribution to explain intent. This validates the importance of inclusion of

this variable to the original theory.

The results of this study indicate that all the variables in the HBM and RAPB help to explain attitude and intent to get circumcised but that promotional efforts might want to emphasize true benefits. While the mythical benefits provide explanation to some degree, it is best for the promotional efforts to remove these myths so as not to have people undergo the procedure for the wrong reasons. Also, other significant persons'/community wishes provided some explanation too. In a collectivistic society such as that found in Uganda, beliefs of others in the community and society play a role in influencing decisions. This suggests that promotional efforts need to concentrate not only on adult males but also on others who might influence them. Making circumcision a community norm will be beneficial for the uptake of the intervention. Finally, the ability to abstain from sex after surgery to give time to heal was another important variable. Those who felt they could do this had a higher intent to get circumcised. Thus promotional efforts could suggest ways to increase perceived power.

While both HBM and RAPB significantly predicted attitude and behavioral intention, they did not explain intention as well as they explained attitude. Because barriers was a composite variable, the influence of barrier was not tested independently. It is, however, likely that the high pain perception among respondents was a barrier, making the leap from attitude to action difficult. Behavior change is the ultimate goal of most health related interventions and thus promotional efforts need to focus on methods to bridge the gap by exploring how certain variables, for example, in this case perceived power, can be used to overcome possible barriers: if you have the power to abstain then you have the power to overcome fear of pain.

Given that the sample was selected from two slums in Kampala using probability techniques, these results could be generalized to similar geographical and socio-economic status populations within Uganda. While these results cannot be generalized to other parts of the world in terms of specific findings, what can be said that might be useful to other countries is the importance of conducting theoretically based formative research using models such as HBM or RAPB to identify variables that are particularly good predictors of attitude and intent to behave. These predictors may then be used successfully in promotional campaigns to increase the adoption of circumcision. In contexts where resources are limited to conduct such extensive research, it might still be profitable to include variables of particular relevance locally; for example, research in collectivistic societies should include normative beliefs and motivation to comply.

The study provides some insights into enablers of male circumcision. These may be used to the advantage in the design of promotional campaigns. At the same time, the study has limitations. The small size of the sample is a limitation; funding and time limitations did not allow the use of a larger sample. Additionally, some of the reliabilities were below the .70 standard. Variables with reliabilities below .70 but above .60 were the dependent variable behavioral intent as well as perceived barriers, cues to action, and motivation to comply. Variables that had lower

reliabilities than .6 included the dependent variable attitude and the independent variable perceived power. The measures used in this study were based on considerable reading of theory and male circumcision literature. For example, the perceived power variable was operationalized as ability to abstain because this is seen as a major issue in male

circumcision. Similarly, risky behavior and its potential to put women in danger are real issues facing the uptake of male circumcision and were therefore included as perceived barriers. Still, more work needs to be done in developing measures for the HBM and RAPB models within the context of male circumcision.

Table 3 Regression of Independent Variables from the Theory of Reasoned Action/Planned Behavior on Behavioral Intention towards Male Circumcision

Multiple R:		.470	
R square		.221	
Adjusted R square:		.144	
Standard Error:		.90	
F value: 2.866; p = .007			
	df	Sum of Squares	Mean Square
Regression	8	17.8	2.225
Residual	81	62.881	.776

Variable	B	SE B	β	t	Sig. t	(sr ²)
Constant	1.413	.706		2.001	.049	
True Behavioral Beliefs	.089	.182	.078	.487	.628	n.s.
Mythical Behavioral Beliefs	.020	.100	.026	.203	.839	n.s.
Evaluation of Behavioral Outcome	.145	.118	.164	1.229	.223	n.s.
Normative Beliefs Injunctive	.171	.159	.199	1.077	.284	n.s.
Normative Beliefs Descriptive	-.084	.141	-.092	-.596	.553	n.s.
Motivation to Comply	.038	.113	.034	.333	.740	n.s.
Control Beliefs	.056	.103	.070	.547	.586	n.s.
Perceived Power	.255	.117	.225	2.169	.033	.045

Table 4 Regression of Independent Variables from the Theory of Reasoned Action/Planned Behavior on Attitude towards Male Circumcision

Multiple R:		.785	
R square		.616	
Adjusted R square:		.577	
Standard Error:		.58	
F value: 15.85; p = .000			
	df	Sum of Squares	Mean Square
Regression	8	43.128	5.391
Residual	79	26.870	.340

Variable	B	SE B	β	t	Sig. t	(sr ²)
Constant	1.376	.472		2.913	.005	
True Behavioral Beliefs	.409	.124	.382	3.307	.001	.053
Mythical Behavioral Beliefs	.103	.066	.140	1.552	.125	n.s.
Evaluation of Behavioral Outcome	.022	.079	.027	.280	.780	n.s.
Normative Beliefs Injunctive	.292	.106	.364	2.750	.007	.037
Normative Beliefs Descriptive	-.063	.093	-.075	-.680	.498	n.s.
Motivation to Comply	-.120	.075	-.117	-1.590	.116	n.s.
Control Beliefs	.082	.069	.109	1.188	.239	n.s.
Perceived Power	-.027	.079	-.025	-.338	.736	n.s.

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