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ADEQUACY OF PSYCHOLOGICAL MODELS FOR RISK REDUCTION BEHAVIOUR IN HIV AND AIDS

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Social cognition models (SCMs) have been developed and applied to the understanding of health behaviours. SCMs examine how an individual's cognition predicts health related behaviours and deterrninants of modifications in behaviour. The most commonly used SCMs to predict health related behaviours include the Health Belief Model (HBM)[1], Theory of Reasoned Action (TRA)[2], Protection Motivation Theory (PMT)[3], and Self-efficacy Theory (SET)[4]. All these major theories of health behaviour have been applied to understanding HIV preventive behaviours. Other models such as Health Locus of Control (HLC)[5], Precautionary Adoption Process (PAP)[6], Self Regulation Theory (SRT)[7], and Transtheoretical Model of Change (TMC)[8], have not been widely applied in HIV prevention, and therefore will not be described in this paper.

More recently, two models were developed specifically for the understanding of HIV risk behaviour. The AIDS Risk Reduction Model (ARRM)[9] and the Information-MotivationBehavioural skills (IMB) model[10,11].

THE HEALTH BELIEF MODEL

The HBM[1] has been one of the most widely used SCMs. Its original form describes four main psychological components: perceived susceptibility to a disease, perceived severity of a disease, perceived benefits of taking action and barriers to taking action.

Perceived susceptibility reflects subjective risks of contracting a health condition. Perceived severity refiects all subjective concern of the seriousness of contracting an illness. Perceived benefits of taking action refers to values regarding the effectiveness of known available alternatives in reducing the disease threat. Barriers to taking action represent all the potential negative aspects associated with undertaking the behaviour. The greater the perceived susceptibility and perceived severity of an illness the greater the likelihood of deciding to take some action. The final part of the model is a 'cue to action'. The cue may be internal, as for instance perceived physical symptoms or external such as the impact of a media communication.

The HBM has been widely used to predict health related behaviours including smoking cessation, medication compliance, diabetic regimen and has received extensive empirical support in predicting health behaviour and outcomes[12]. In relation to AIDS preventive behaviours, the HBM has been used in several samples including homosexual and bisexual men[13,14,15,16], adolescents[17,18,19], male prostitutes[20], injecting drug users[21], and heterosexuals[22,23], with contrasting results.

Abraham and colleagues[17], reporting from a sample of adolescents, found that some HBM measures were significantly correlated with condom use. However, these variables did not account for a significant proportion of variance. Further, prior condom use, age, and gender, components not measured by the model, were significant predictors of consistency of condom use. In a sample of Zimbabwean students[19], susceptibility, severity and barriers were associated with condom use, but only among males. Among female respondents, none of these variables predicted condom use. The authors suggested that this difference could be due to social cultural differences in the position of women in Zimbabwe, a social context variable not measured by the HBM. By contrast, in a sample of adolescents[18] HBM measures were predictive of condom use. Measures of perceived severity of HIV infection, however, did not explain much variation in condom use.

The results of a study among women[22] revealed that the adoption of a series of protective behaviours were associated with personal susceptibility and barriers. However, perceived severity and cue to action were associated with the adoption of one single preventive behaviour, and no association was found for measures of perceived benefits.

Applying HBM measures to assess predictors of behavioural risk reduction among homosexual men, Montgomery *et al.*[16] found that perceived susceptibility

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had little effect on behaviour. Measures of severity, however, showed beneficial effect on several measures of behaviour change. McCusker *et al.*[24], reporting from a sample of homosexual men, found that perceived susceptibility was weakly associated with adoption of safer sex behaviours. Further, perceived susceptibility was associated with a greater number of sexual partners in crosssectional analyses of the cohort[25]. In another sample of homosexual men[13], barriers to change was a significant predictor of risk behaviour. However, previous sexual behaviour was the most powerful predictor of number of partners after six months, accounting for 51% of the variance.

These studies suggest that the HBM has yielded mixed findings in explaining HIV preventive behaviour. HBM failure to take into account social factors in which sexual behaviour takes place may have contributed for the conflicting findings reported in the several studies on HIV preventive behaviour using the HBM or its components.

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THE THEORY OF REASONED ACTION

The TRA[2] proposes that any specific behaviour is a function of a person's intention to perform that behaviour. Intentions are determined by two components: a) attitudes toward performing the behaviour, which are a function of a person's beliefs that performing the behaviour will result in certain outcomes, and evaluation of these outcomes; b) subjective norms which are based on a person's beliefs that specific individuals or groups think he/she should or should not perform the behaviour, and the person's motivation to comply with opinions of those referents. The beliefs underlying a person's attitude toward the behaviour are named behaviour beliefs. The beliefs underlying a person's subjective norms are named normative beliefs[2].

The TRA was extended in the Theory of Planned Behaviour (TPB) by Azjen[26]. It included all the original components of TRA but included perceived behaviour control as a predictor of intention.

The TRA has been applied to the prediction of a broad range of health related behaviours including alcoholism, substance use, seat belt and smoking behaviour with some degree of success[27, 28, 29]. In the context of HIV preventive behaviour, research applying the TRA has provided some support for its utility in the prediction of safe sexual behaviour, but some inconsistencies have also been reported.

In a sample of heterosexual university students, attitudes and norms predicted intentions to avoid casual sex and ask partners about their sexual and intravenous drug use history. However, attitudes and norms did not predict intentions to engage in exclusive sexual relationships. Intentions also predicted actual behaviour for all three behaviours assessed (engaging in an exclusive relationship, avoiding casual sex, and asking partners about their sexual and intravenous drug use history)[28]. By contrast, among adolescents[17] intentions were not found to predict consistency of condom use.

Boldero *et al.*[30] applied TPB, an extension of the TRA, in a sample of adolescents reported that intentions to use a condom were predictors of use. Contextual factors (communi-cation with partners, sexual arousal, and condom availability) were also, however, strong predictors of condom use.

Support for the theory was reported by Fisher *et al.*[31] among homosexuals, heterosexual university students, and schoolboys and girls. Intentions to engage in nearly every preventive behaviour under study were a function of both attitudes toward the behaviour and subjective norms. Furthermore, attitudes and norms accounted for a considerable proportion of the variance in intention across the behaviours assessed.

Some support for the TRA was reported by Gallois *et al.*[32] among heterosexual students and heterosexuals and homosexuals from the general community. Attitude and subjective norm explained a significant amount of variance in intentions to use condoms for heterosexuals in both the student and the general community sample. For homosexuals, however, these variables were not significant predictors of intentions to engage in safe sex. Furthermore, past behaviour was a significant predictor of intention in the homosexual sample and in the student sample. Those who had used condoms in the past were more likely to intend to use them. In a sample of homosexual men, however, limited support for the TRA was reported[33]. Subjective norms were good predictors of intention to use condoms, while attitudes were poor predictors. In addition, previous condom use, a variable not assessed by the TRA, was the best predictor of intentions to use condoms in the future.

PROTECTION MOTIVATION THEORY

The PMT[3] is an expectancy value model of preventive health behaviour. It was originally designed to clarify the concept of fear appeals. The theory was revised by Rogers[34], incorporating the concept of self-efficacy[4]. According to the model[34] information about a health threat initiates two appraisal processes: threat appraisal and coping appraisal. Threat appraisal is based on the individual's evaluation of his/her vulnerability and severity of a health hazard. Copping appraisal process is based on the individual's response efficacy and selfefficacy. Response efficacy is an individual's beliefs that continuing a behaviour is an effective way of avoiding the health threat. Self-efficacy is the individual's perception of his/her ability to perform a recommended health action successfully. Threat appraisal and coping appraisal initiate protection motivation, a mediating variable which arouses, sustain, and directs preventive behaviour.

Research on SV preventive behaviour using PMT as a framework or applying some of its constructs have shown ambiguous results. Some of its concepts have been associated with safe sex behaviour, while others have been found to be poor predictors of safe behaviour. The role of self-efficacy and response efficacy seems to be a more positive construct in promoting safe sex than others in the theory.

Abraham *et al.*[35] found that perceived self-efficacy was a predictor of anticipated condom use in a sample of adolescents. Threat appraisal variables assessed by perceived

severity and perceived susceptibility were not associated with preventive behaviour. Van der Velde and van der Plight[36] reporting from a sample of male heterosexuals and homosexuals, found that self-efficacy and response efficacy were significantly related to intention to safe sex among heterosexuals, but vulnerability and severity were not. Furthermore, variables external to PMT, as social norms and previous behaviour were important predictors of behavioural intentions for both heterosexuals and homosexuals. Among HIV seronegative and seropositive homosexual men, response efficacy predicted reduction in number of partners but only among HIV seronegatives without primary partners[13].

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SELF-EFFICACY THEORY

The SET was originally defined by Bandura[4] a people's beliefs that they have the abilities to perform a specific behaviour. According to the theory, behaviour change and maintenance are a function of outcome expectations and efficacy expectations[4]. Outcome expectations consist of people's beliefs that a given behaviour will lead to specific outcomes. Efficacy expectations consist of people's convictions of being able to execute the behaviour required to achieve the outcomes. With regard to sexual behaviour self-efficacy is a sense of personal power to exercise control of sexual situations[37].

Perceived self-efficacy has been studied with respect to HIV prevention with some degree of success. Among college students[38] situational efficacy (to protect oneself from AIDS) was the strong predictor of general behaviour intentions to take precautions against contracting AIDS. Goldman and Harlow[39] also found that self-efficacy was positively related to AIDS preventive behaviour in a sample of college students.

Association of greater perceived self-efficacy to reduce the number of partners was reported among homosexual and bisexual men[25]. Increased self-efficacy was associated with fewer sexual partners at time two of a longitudinal study among homosexuals[13]. However, the relation of self-efficacy to reduction in number of partners depended on HIV status and partners status (with or without primary partner). Examining predictors of relapse into unsafe sexual behaviour among homosexual men, de Wit *et al.*[40] reported that men with lower personal efficacy regarding condom use with casual partners were more likely to have relapsed into risk behaviour. Further, homosexual men with low personal efficacy were more likely to engage in unprotected anal intercourse[41]. However, other variables, such as preference for anal intercourse and being in a monogamous relationship were also associated with high risky sex. By contrast, perceived self-efficacy (the individuals sense of ability to change their behaviour) was related to only a single behaviour outcome in a longitudinal analysis of a cohort of homosexual men[42].

THE AIDS RISK REDUCTION MODEL AND THE INFORMATION-MOTIVATION-BEHAVIOURAL SKILLS MODEL

The ARRM[9] and the IMB[10, 11] were specifically developed to understand and promote AIDS preventive behaviour.

The ARRM is a stage model of AIDS risk reduction behaviour which integrates components of several SCMs: HBM, SET, TRA, diffusion theory, and help-seeking models[9, 43]. It also integrates both sexual behaviour components and influences created by the AIDS epidemic[43].

The model involves three stages a person may need to reduce or change risky sexual activity:

1) recognising and labelling one's sexual behaviour as risky for contracting HIV infection, 2) making a commitment to reduce high risk behaviour and increase low risk activities, and 3) seeking andenacting strategies to obtain these goals. Each stage of the change process is influenced by a number of cognitive, emotional and social factors. In the first stage, labelling, variables such as HIV transmission knowledge, perceived susceptibility, aversive and positive emotions, and belief that AIDS is undesirable, influence labelling one's behaviour as risky. The second stage, commitment, is influenced by one's analysis of the costs and benefits of changing and self-efficacy. Knowledge of the health utility and enjoyability of several sexual practices are important factors influencing the cost-benefit process. In addition, social factors such as social support and reference group norms may have considerable influence on cost-benefit assessment and on self-efficacy beliefs. The third stage, enacting, is influenced by help-seeking behaviour and sexual communication abilities.

The IMB model[10, 11] incorporates construçts of TRA, HBM and the ARRM. The IMB model posits three fundamental determinants of AIDS preventive behaviour: 1) AIDS prevention reduction information, 2) motivation and 3) behavioural skills. Information, both on the means of AIDS transmission and of specific methods for preventing infection are necessary prerequisites for risk reduction behaviour. The second determinant, motivation to engage in AIDS prevention, is assumed to be a function of one's attitude toward the AIDS preventive act, and of relevant subjective norms regarding the AIDS preventive act. Motivation may be affected by factors such as perceived vulnerability to HIV, perceived costs and benefits of HIV prevention and type of partners. Behavioural skills for performing specific AIDS preventive behaviours are the third component of IMB. A person must have the requisite skills to effectively perform AIDS preventive behaviour. Behavioural skills involve, for instance, verbal and non-verbal abilities to communicate about and to negotiate safe sex, to refuse to engage in unsafe sex, and to properly use a condom.

The ARRM was applied to examine the determinants of condom use in a sample of heterosexuals with HIV risk factor[44]. Respondents with a history of STD were significantly more likely to label (stage 1) their behaviour as problematic. Respondents who believed that others

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were more likely to get HIV were less likely to label their sexual behaviour as risky for SV infection. With regard to commitment (stage 2), labelling was related to commitment to use condoms with secondary, but not with primary partners. Perceived social norms for condom use and enjoyment of using condoms were significant correlates of commitment for using condoms both with secondary and primary partners. Neither efficacy beliefs nor perceived barriers of condom use were related to commitment. On stage 3 (enactment), health protective sexual communication, commitment to use condoms and enjoyment to use condoms were significant correlates of condom use both with secondary and primary partners. Perceived norms were correlated with condom use, but only with secondary partners. The authors pointed out that the model was relatively consistent for condom use with secondary partners, but less consistent for condom use with primary partners.

The IMB model was tested in two different samples: homosexual men and heterosexual students [11]. Both the information and motivation components of the model had reliable effects on the behavioural skills component across the two samples. On AIlDS preventive behaviour, information and motivation had mediate effects in both the homosexual and heterosexual sample. Behavioural skills had reliable effects on AIDS preventive behaviour on the heterosexual sample, but in the homosexual sample, behavioural skills affected preventive behaviour at a level that reached approximated significance.

LIMITATIONS OF THE PSYCHO-SOCIAL MODELS TO HIV PREVENTIVE BEHAVIOUR

The main SCMs of health behaviour have been used in HIV prevention, and in some extent have proved useful to the understanding of the determinants of HIV preventive behaviour. Most of the studies investigating the adoption of safe sexual behaviour have been guided by these models, either applying a specific model or combining components of the several theories. Abraham and Sheeran[45] have pointed out that the application of these models represented a valuable advance over simple information campaigns which assumed that increased knowledge would automatically lead to behaviour change. However, some limitations and criticism have been highlighted with these models in its applicability to HIV preventive behaviour due to the unique features of the AIDS epidemic.

CONCEPT OF RATIONALITY

One of the limitations concerns the assumption that the concept of rationality in which these models are based is appropriate for the understanding of sexual behaviour[46]. These models are individualistic in nature and decision making is assumed to be based on rational evaluations. Within these theories sexual behaviour is assumed to be a rational behaviour that is always under an individual's control. This results in failure to consider that decisions about sexual behaviour sometimes are made in the hart of the moment when the person is emotionally and physically aroused[47]. Within this perspective, the intention-behaviour approach is inappropriate to the study of HIV preventive behaviour.

It has been suggested that HIV risk behaviours are different from other health threats due to their complexity and the severity posed by AIDS[19]. Health protective models were designed to deal with behaviours that are less threatening than HIV, that are not fatal and that are reversible[16, 47] which could explain the contrasting results found in studies applying SCMs or their constructs and adoption of HIV preventive measures.

SITUATIONAL INTERPERSONAL AND SOCIAL FACTORS

A second aspect that limited the applicability of SCMs in HIV preventive behaviour is the failure to consider non-cognitive factors. There is an increasing consensus among researchers that situational, interpersonal and social factors are extremely important in the investigation of HIV preventive behaviour[9, 19, 30, 46, 48]. It has been suggested[45, 48, 49] that SCMs need to be expanded to incorporate social and personal variables to provide a more effective approach to the understanding of determinants of HIV preventive behaviour. By focusing on cognitive factors, some important influences on behaviour such as social and interpersonal factors may be neglected.

Behaviours associated with HIV are clearly social behaviours that require social interaction. SCMs tend to ignore a distinct factor in HIV preventive behaviour: sex is an interaction between two or more people. Preventing risk sexual behaviour may require interaction between individuals, negotiation of safe sexual behaviour, and involvement of both partners.

Individual's intentions to use a condom, for instance, may be altered by other factors originated by the interaction with another person[48]. Moreover, intentions may be unstable over time and may be a function of what persons ideally expect to do or what persons believe their partners want to do.

Interpersonal factors such as intimacy[50], communication skills[51, 52, 53], gender roles[53, 54, 55, 56], emotional involvement[52, 57, 58], partner's serostatus[58, 59, 60] have been linked to difficulties in engaging in safe sexual behaviour or change risky sexual behaviour. Furthermore, type of relationship (e.g regular versus casual) has been one of the most important predictors of safe or risky behaviour in several studies[61, 62, 63]. Finally, situational factors such as substance use prior to sexual activity have been positively associated with risky sexual behaviour in a number of studies[64, 65, 66, 67].

The ARRM[9] in some extent combine cognitive variables such as susceptibility, motivation and intention with individual and social variables to asses determinants of HIV preventive behaviour.

In conclusion, SCMshave in some extent been proved useful in explaining HIV preventive behaviour. However, the assumption that sexual behaviour is based on an

individual's rational intention, and failure to consider the effects of interpersonal and social factors in which sexual decisions are made has limited the effectiveness of social cognitive models in addressing HIV precautionary behaviour.

In conclusion, SCMs have in some extent been proved useful in explaining HIV preventive behaviour.

ABSTRACT

The most commonly used Social Cognition models (SCMs) have been applied to understand HIV preventive behaviour. This paper describes the major psychological models and their applicability to examine factors associated with HIV preventive behaviour. The limitations and criticisms that have been highlighted in these models' applicability to HIV preventive behaviour are also described.

Keywords: Human immunodeficiency virus, social cognition models, sexual behaviour

RESUMO

Os modelos de cognição social mais utilizados em psicologia têm sido aplicados para entender os fatores associados à prevenção do HIV. Este artigo descreve os modelos psicológicos e sua utilização para examinar os fatores associados aos comportamentos preventivos para o HIV. Este artigo descreve ainda as limitações e críticas que tem sido levantadas na aplicação desses modelos em relação aos comportamentos preventivos para o HIV.

Unitermos: *Vírus da imunodeficiencia humana, modelos de cognição social, comportamento sexual.*

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