

Assessment of condom use among Bolivian truck drivers through the lens of social cognitive theory

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SUMMARY

This study demonstrates that Bolivian long distance truck drivers are a high risk population of HIV infection and transmission, supporting other global studies involving truck drivers and their high risk. The aims of this investigation were to estimate the prevalence of high risk behaviors and to identify predictors of condom use in this population.

Analysis was completed on survey results from 246 male truckers (aged 18–67). About one in three of the

truck drivers (30%) reported having had a sexually transmitted infection sometime in their past. More than half (56%) reported having sex with casual partners. Other risks involved unprotected anal sex. Age and two social cognitive constructs (outcome expectations and perceived social norms) predicted condom use from logistic regression analysis. The authors discuss the need for expanded HIV/sexually transmitted infection prevention programs that incorporate social cognitions.

Key words: truck drivers; Bolivia; condom use; social cognitive theory

INTRODUCTION

Studies have documented high or moderate HIV prevalence (as high as 56%) in trucking populations in developing countries (Carswell *et al.*, 1989; Bwayo *et al.*, 1994; Mbugua *et al.*, 1995; Rakwar *et al.*, 1999; Ramjee and Gouws, 2002). Research demonstrating low HIV prevalence in truck drivers still revealed high risk, either through sex with multiple partners, sex with injecting drug users, sex with commercial sex workers (CSWs), or infection expedited through other sexually transmitted infections (STIs) [Morris *et al.*, 1996; Lacerda *et al.*, 1997; Agha, 2000; Population Services International (PSI), 2000; Rao, *et al.*, 1999]. Therefore, truck driver behavior is a cause for concern in regard to HIV transmission.

In eastern Bolivia, five developments indicated a potential HIV transmission problem: (i) STI rates were high and had been increasing in recent years [Schmunis *et al.*, 1998; Bolivian Ministry of Health (MOH), 2000; PAHO, 2000]; (ii) there was a sharp increase in the number of recent HIV cases in Bolivia (PAHO-Bolivia, 2004); (iii) a high proportion of truck drivers in Bolivia reported sex with CSW and about a third to half of *transportistas* (transporters of people or cargo) or long distance truckers reported a past STI (PSI, 2000; Sorensen, 2003); (iv) the majority of the country's newly diagnosed HIV cases came from the eastern province of Santa Cruz (USAID, 2004) and (v) only 6% of the Bolivian males reported using condoms during their last sexual relation [Demographic Health Survey (DHS), 1998].

Social cognitive theory (SCT) was incorporated into this study in an attempt to explain behavior in heterosexual males on the basis of social, personal and cognitive influences. Bandura (Bandura, 1977; Bandura, 1986) described a triad of factors (self-regulatory behavior, the environment and cognitive constructs) influencing the individual. The individual's actions likewise give rise to future influence in this complex web labeled 'reciprocal determinism'. The first factor, self-regulatory behavior, is a reflective action under which the self evaluates itself. The second factor, the environment, offers a rich social context for development (such as vicarious learning). The third factor, cognitive constructs, suggests that beliefs and other cognitions can determine the course of actions emanating from the individual. Examples of cognitive constructs include self-efficacy, attitude, outcome expectancy and perceived social norms.

The purpose of this investigation is to procure predictors of condom use and to estimate the prevalence of high risk behaviors of Bolivian long distance truck drivers. In this study, we tested the predictive capacity of four cognitive constructs (i.e. self-efficacy, attitude, outcome expectancy, and perceived social norms) as well as demographic, occupational and behavioral variables, on condom use.

METHODS

Procedure

Bolivia is divided into nine *departamentos* or provinces. The largest in area, the province of Santa Cruz, constitutes most of eastern Bolivia. Their year 2000 population of 1 812 522 was 22% of the country's total population [*Instituto Nacional de Estadística* (INE), 2003]. The various sites for this investigation were in this province, none more than 50 km away from the province capital, the city of *Santa Cruz de la Sierra*. Sites were selected to render maximum variation of heterogeneous settings in terms of route, cargo, ethnicity and work schedule of truckers (Patton, 1990).

The Bolivian MOH approved this study in April 2000. The Human Subjects committee of the University of New Orleans granted approval of the methods in October 2000. From June to August 2002, in the province of Santa Cruz, Bolivia, a total of 248 truck drivers were interviewed by a

team of six local health care workers. Participants were convenience sampled at 13 different truck stops. Consent was asked before conducting the interview. Long distance truckers under 18 years of age were excluded from analysis, leaving 246 participants.

Participants

The average age of the participant was 36 years (range 18–67 years). The largest ethnic group was *Colla* (70%—the term *Colla* represents those of highland, Indian ancestry). Sixty-three percent of the truckers were married and 87% were Catholic. Concerning education, 17% of the participants completed primary school but did not achieve formal education beyond primary school; another 64% finished high school. The most frequent salary¹ category was 1001–2000 *Bolivianos* (*Bs.*) per month (\$143–286), attained by 100 truckers (41%). About a third of the truckers (34%) reported that they earn even less, or \$0–143 per month.

Occupational variables were examined since the occupation of truck drivers may frame their social lifestyle. The majority of truckers (64%) were accustomed to spending 1–4 weeks away from home per trip. About 14% spent a considerable time, 1–3 months per trip, away from home. A minority of truck drivers from this study were interviewed in their home region (30%); most (63%) claimed to live in the western *altiplano* (highlands). One hundred sixty-six truckers (68%) said that they worked throughout the country. Another 18% worked beyond the Bolivian border into neighboring countries. The majority of truckers (57%) had worked in this occupation for more than 10 years. Nearly half (44%) owned their own trucks. Ninety-seven percent of the participants reported having either wives ($n = 155$) or steady female partners ($n = 84$). Still, nearly 56% of the participants reported having multiple sex partners (i.e. being married and having sex with another partner or being single and having two or more partners within a 3-month period).

Instrument

A 121-item questionnaire and other interview guides were used to address the study's

¹ Salaries were converted to dollar amounts at the June 2000 exchange rate of one US dollar per 6.10 *Bs.*

purpose. In an earlier phase, the psychometric indices were tested for reliability from the responses of 32 truck drivers who did not take part in the large survey.

Items measuring attitude of condom use were borrowed from an instrument in Spanish and available through the University of California in San Francisco (UCSF, 2000). The instrument crafted 25 items into a true/false format. In previous reliability testing, the index demonstrated an alpha of 0.83. Examples of these inquiries included 'do you think condom use can prevent a sexual infection?' and 'do you think a condom diminishes sexual pleasure?'. In regard to perceived social norms, nine items were borrowed from O'Leary *et al.* (O'Leary *et al.*, 1992). This tool was used to create an index that expressed awareness of sexual behavior in others, including condom use, based on a four-point Likert scale. We reformatted the response choices to a true/false format. Examples included 'very few truckers in Bolivia change their behavior because of HIV/AIDS' and 'the majority of truckers carry condoms'. The alpha for this index was 0.75. Both attitude and perceived social norm components demonstrated acceptable reliability.

Outcome expectancy was measured by three items. One of these items listed various future conditions under which one may or may not use condoms. The item began 'the next time you have sex, you plan to use a condom...' and examples included '...only if it is convenient', '...only if my partner insists' or 'you do not plan to use a condom'. Self-efficacy was assessed using one item 'would you still use a condom if inebriated?'. Neither outcome expectancy nor self-efficacy was reliability tested.

Analyses

Skewed continuous variables were log or inversely transformed. MANOVA was used to identify the significant continuous variables and chi square analysis identified significant categorical variables. MANOVA was chosen over ANOVA to control for intercorrelations (e.g. age and years of experience would naturally correlate). Condom use was initially categorized into three groups: never used condoms, used condoms but not recently and recent condom use. Type-I error was adjusted by Bonferroni correction.

Significant variables were placed in a final logistic regression model. Logistic regression analysis offered the advantages of controlling for each variable, increased power and the flexibility to include a wide range of measures (demographic, behavioral, occupational and cognitive). The condom use variable was collapsed to ever used versus never used in the last phase of the analysis.

RESULTS

Predictors

Of 246 truck drivers, about one-third (31%) said that they had never used condoms. Of those who had used condoms, 57% had used them but not recently and the remaining 43% had used condoms within the last month. Chi square analysis resulted in two significant variables by condom use groups. These were 'residence' ($p = 0.001$) and 'number of years-experience' ($p = 0.007$) as a truck driver. A trucker who resided in the Bolivian tropics was more likely to use condoms recently and those living in the *altiplano* were more likely to have never used condoms. Drivers with the least experience demonstrated more recent condom use. These variables were later used in the regression analysis.

In the MANOVA analysis, age achieved significant association with condom use, but explained only 5.6% of the total variance ($p = 0.001$). MANOVA also selected two cognitive measures: outcome expectancy ($p = 0.000$) and perceived social norms ($p = 0.007$). Together, these two variables explained another 13.0% of the condom use group variance. In addition, the number of sex partners remained a significant predictor ($p = 0.009$). This variable alone explained 12.4% of variance in the condom use group. Total variance explained by these four significant variables amounted to 31%. These variables were also selected for the regression model.

Table 1 shows the results from the logistic regression analysis where the outcome remained 'condom use' but was collapsed from three groups (never used, used but not recently and recent use) to two: no condom use ($n = 76$) versus any condom use ($n = 167$). Three predictors emerged from backward regression analysis, two of which were social cognitive constructs.

Table 1: Multivariate logistic regression outcomes associated with differences between no condom use and any condom use ($n = 246$)

	Unadjusted <i>p</i> -value	Unadjusted odds ratio (95% CI)	Adjusted <i>p</i> -value	Adjusted odds ratio (95% CI)
Age	0.008*	0.952 (0.92–0.99)	0.005*	0.958 (0.93–0.99)
Outcome expectancy	0.000*	1.751 (1.34–2.30)	0.000*	1.724 (1.33–2.24)
Perceived social norms	0.079	1.156 (0.98–1.36)	0.039*	1.180 (1.01–1.38)
Number of sex partners	0.815	1.038 (0.76–1.41)	N/A	
Residence			N/A	
<i>Altiplano</i>	N/A	1 (reference)		
Tropical	0.133	0.595 (0.30–1.17)		
Years experience				
≤10	N/A	1 (reference)	N/A	
>10	0.579	0.803 (0.37–1.75)		

* $p < 0.05$

The variables were age, outcome expectancy and perceived social norms. Age, showed an inverse trend. More specifically, for each year increase in age a trucker was 4% less likely to have used condoms. Both outcome expectancy and perceived social norms showed a significant, positive relationship with condom use, controlling for all other variables.

Risk behaviors

Twelve percent of the participants reported having anal sex with regular partners. Younger truckers were significantly more likely to have anal sex with regular partners than older truckers (Fisher's exact test, $p = 0.001$). There was no difference by age group for anal sex with casual partners (chi square test, $p = 0.745$). Of those truckers who had sex with casual partners, 17% reported having anal sex with them. In general, condom use increased with the number of partners, regardless of trucker age group. Overall, 37% of the Bolivian truck drivers used condoms with regular partners (wives or steady girlfriends) and 63% reported use with casual partners. For anal sex, ~50% reported condom use with regular partners and only 35% reported use with casual partners.

Thirty percent of the truckers said that they have had an STI in the past. The majority of these drivers mentioned specific STI pathogens and corroborated their self reports with symptoms. Less than half (42%) of the participants who had an STI disclosed their status to their regular partners. One in 20 truckers who had an

STI claimed that they were never treated. Significant differences were found between the age group and the type of casual partner in truckers who self reported an STI ($p = 0.036$). The majority of older truckers (56%) with an STI claimed to receive it from CSW, whereas the majority of younger truckers (75%) with an STI received it from a 'friend', 'lover' or other married women.

DISCUSSION

Predictors

SCT attempts to explain the complexities of behavioral learning through interactions of self-regulatory behavior, the social environment and cognitive constructs. This study verified two SCT constructs as significant predictors of condom use in Bolivian truck drivers: outcome expectancies and perceived social norms. There is only one other truck driver investigation in the literature, as far as the authors are aware, which used an established health model (Bryan *et al.*, 2001).

This investigation supports previous studies that have found significant associations between condom use and outcome expectancy (Wulfert and Wan, 1993; DiIorio *et al.*, 1997; Polacsek *et al.*, 1999). Bandura (Bandura, 1977; Bandura, 1986) claimed that outcome expectancy is an anticipated benefit, a symbol of memory transformed into forethought capacity. Therefore, outcome expectancy contributes to motivation under the SCT umbrella. Data from this study

demonstrated that truck drivers who used condoms most recently had the highest outcome expectancy scores. It follows that they were more motivated to protect themselves. Likewise, perception of social norms predicted condom use. The group of truckers who used condoms most recently manifested the strongest social norm scores. This can be interpreted as engaging attention toward peers concerning safe sexual behavior. That is, if truck drivers perceive others as condom users, they are more likely to be condom users also.

Self-efficacy in Bolivian truck drivers did not directly predict condom use. This was an unexpected finding because previous studies link self-efficacy to protective behaviors (Wulfert and Wan 1993; DiIorio *et al.*, 1997; Polacsek *et al.*, 1999). However, self-efficacy significantly correlated with perceived social norms (data not shown), which did predict condom use. These connections support the idea of synergistic cognitive relationships as explained theory and may indicate different psycho-mechanisms to explain condom use.

Risk behaviors

This article describes Bolivian truckers not only by SCT cognitions, but also by demographic, occupational and behavioral characteristics. Only one demographic variable demonstrated significance of condom use after controlling for all other variables. This was age. Older truckers were less likely to be condom users. Rao *et al.* (Rao *et al.*, 1999) also reported that condom use decreased with increasing age in a population of Indian truck drivers. Two explanations are given in an effort to grasp this situation. First, sexual behavior may be strongly influenced by societal pressures. Bolivia is experiencing a rapidly changing culture², which may impact sexual behavior. For example, within the past 15 years, Bolivia has experienced a fairly recent social phenomenon of institutionalized sex education along with media broadcasts of safe sex (Wright, 2000). Most elder truck drivers probably have not been exposed to safe sex education programs, but younger truckers

probably have through prior schooling or mandatory military service. This study demonstrates that younger drivers embrace more condom use compared with their older counterparts.

Secondly, accumulated experience as a truck driver may explain a phenomenon of less sexually healthy behavior. If a truck driver becomes more stressed or bored through work, the accumulating occupation experience may negatively influence safe sexual behavior. Indeed, in univariate analysis, job experience negatively associated with condom use, but did not stand up to further statistical modeling. In addition, evidence emerged in which types of casual sex partners were different depending on age groups: the older truckers showed more inclination to engage in sex with CSW. Lacerda *et al.* (Lacerda *et al.*, 1997) demonstrated that more job experience associated with drug use, which, in turn, predicted STI status in Brazilian truckers. In the USA, in contrast, Stratford *et al.* (Stratford *et al.*, 2000) suggested that younger or less experienced truckers were less careful in their sexual behaviors. The US investigation showed that younger North American drivers experienced more occupational pressure than their older counterparts and consequently immersed themselves in unsafe sexual behaviors to relieve the stress. However, qualitative research in Bolivia, prior to this study, showed that neither stress nor boredom is prevalent in Bolivian truckers (Sorensen, 2003). The length of employment does not appear to influence condom use in this South American setting.

Our research concurs with established health literature concerning truck driver behavior and establishes the highest percentage of multiple-partner sex among heterosexual Latin American truck drivers yet reported. Two-thirds of the participants were married and 32% had steady partners, but more than half (56%) reported sex with casual partners. Lacerda *et al.* (Lacerda *et al.*, 1997) also reported a high casual sex partner rate of 40% for drivers in Brazil. In addition, Bolivian truck drivers demonstrated an elevated STI history (according to self-reports), ranging from 30% (quantitative assessment) to 52% [qualitative assessment (Sorensen, 2003)]. Again, this closely parallels that of Lacerda *et al.* (Lacerda *et al.*, 1997), who demonstrated that 47% of the Brazilian truck drivers had STI at sometime in their past.

² Evidence indicating rapid cultural change in Bolivia include An 8% decrease in average number of children per household in just 4 years, 1994–1998 and a substantial increase in those who completed high school from 37% in 1994 to 49% in 1998 (DHS, 1998).

Evidence of anal sex among truck drivers has been documented in only one study. This practice may facilitate HIV transmission (Seage *et al.*, 1993; Halperin, 1998). Nearly one in five (17%) Bolivian truck drivers reported anal sex practices. Younger truckers practiced significantly more anal sex with regular partners than older truckers. This is similar to the findings of Bryan *et al.* (Bryan *et al.*, 2001) in which single Indian truck drivers reported a 17% proportion of anal sex with casual partners, but married Indian truckers reported an 11% proportion with casual partners. In this study, half of the truckers who practiced anal sex with regular partners used condoms, which diminished to 35% when having anal sex with casual partners.

Strengths and limitations

Selection bias remains a credible threat to this study since both participants and data collection sites were convenience sampled. Selection bias also may have occurred due to trucker willingness, or unwillingness, to participate. It is estimated that there were slightly more truckers who refused to be interviewed than those who agree to be interviewed. Such a 'refusal' sub-population could have resulted in unrepresentative responses from the population.

Variable checks were inserted into the questionnaire to control for inconsistent responses. For example, one section in the tool asked whether participants used condoms, another item asked how often and yet another question asked how often participants carried condoms. Only consistent responses were included in the analyses. Still, recall bias may have skewed participants' responses. External validity was assessed through mixed methodology triangulation (Tashakkori and Teddlie, 1998) and internal validity was checked through pilot testing the instrument, evaluating the reliability of indices and appending a social desirability index. There was a lack of a significant association between any SCT cognition and social desirability, evidence that participant responses were valid. Regardless, some behavioral items (e.g. anal sex and STI history) may have suffered underreporting (Sorensen, 2003). Future studies in this field should include both qualitative and quantitative tools in order to report a range instead of a point-prevalence in behavior. Moreover, both qualitative and quantitative tools can indicate concordance or discrepancy

and in so doing substantiate validity or highlight new behavioral phenomena.

CONCLUSION

The prevalence of certain behaviors helps establish Bolivian truck drivers as yet another high risk population in need of education programs. Globally, truck drivers are an established high risk population. They are highly mobile and wealthier than average citizens in developing countries. These points continue to contribute to the HIV/AIDS pandemic. Sexual health efforts for them must focus on a variety of sexual health promoting strategies.

This research supports the notion that a dominant pillar concerning health behavior, according to SCT, is social influence. Bolivian truckers who were more socially aware of condom use also had higher outcome expectancies concerning condoms, but reported more sex partners more anal sex with regular partners, and more recent STIs. A salient explanation to these seemingly contradictory behaviors is that condom use behavior is passively, albeit socially, mediated. Truckers use condoms because they are following a social perception that others are using condoms and not necessarily because they have deemed it a healthy practice. In Bolivia, a profile emerges whereby condoms are used as instruments of social obligation and are used fairly often by younger men. This underscores success in the impact of education campaigns across whole swathes of society. Yet a problem persists in that maintaining sexual health is not perceived as a concept of wellness to oneself nor to an intimate partner. Condom use behavior appears to stem from a psychological compartmentalization in which the rationale to use them is supported by engagement in riskier activities such as having more sex partners or more anal sex.

Health professionals need to carefully consider the notion that condom use, although a behavior that impedes infection transmission, does not arrest risky practices. Health educators should offer comprehensive HIV/STI prevention messages above and beyond those that promote mere condom application. Undoubtedly, workshops based on social cognitive concepts will engage the most attention from male truck drivers and quite possibly those in other occupations.

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