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ORIGINAL PAPER

Intrinsic Religiosity and Health Risk Behaviours Among Black University Students in Limpopo, South Africa

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Abstract Not much is known about religiosity's protective role against health risk behaviour in the South African context. As such, the study investigated the relationship between intrinsic religiosity and health risk behaviours in a sample of Black university students ($N = 335$). Two-way ANOVA showed that there were intrinsic religiosity main effects for alcohol use and sexual behaviour, gender and intrinsic religiosity main effects on tobacco and marijuana use, and gender main effects and gender and intrinsic religiosity interaction effects for engagement in physical activity. Thus, religiosity is an inner resource available to avert engagement in varied health risk behaviours.

Keywords Black university students · Health risk behaviours · Intrinsic religiosity

Introduction

South Africa is experiencing positive outcomes following policy decisions and intervention programmes directed at health risk behaviours (Bor et al. 2013; Bradshaw et al. 2010; SANAC 2011; cf. Shisana et al. 2013). For instance, on HIV/AIDS treatment and prevention, the government's decision to prevent mother-to-child infection, promotion of medical male circumcision and HIV counselling and testing, and the coverage of the antiretroviral treatment programme are prolonging the lives of individuals affected and infected with HIV (Statistics South Africa 2013b). Policy changes, in the form of the Tobacco Products Control Amendment Act, 63 of 2008 and the promotion of behaviour

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change programmes such as *Khomanani* are paying dividends (Republic of South Africa 2008; Department of Health 2006).

Ever since the South African government's interventions pertaining to HIV/AIDS, condom use at sex debut has increased to 66% in 2012 from a low of 10% in 2002. Nearly half of the males of African descent who were uncircumcised expressed the desire to undergo the procedure (Shisana et al. 2014). Tobacco use has declined appreciably, and individuals in the age group 15–24 years who were currently smoking reported that they smoked fewer cigarettes per day than the national average (Shisana et al. 2013). At about the same period as the drastic attitudinal and behavioural changes regarding health risk behaviours were recorded, Statistics South Africa (2013a) noted that rates of AIDS-related deaths have declined steadily.

Yet there are many people at different strata of society who are still at risk for both communicable and non-communicable diseases due to health risk behaviours (Bradshaw et al. 2010; Puoane et al. 2012/2013; Shisana et al. 2013). This also applies to university-age and youthful learners (Reddy et al. 2013). At just over 17% prevalence rate among 15–49 year olds, translating into an estimated 5.6 million HIV infected individuals in the population, proportions of HIV infection are still the highest in the world (Gray et al. 2012/2013). South Africa has the highest number of people on the largest programme of antiretroviral treatment in the world (Statistics South Africa 2013b). Thus, the number of HIV positive individuals is likely to increase as HIV infection no longer becomes a death sentence. The increase itself multiplies the risk of infection since those who have the virus integrate into society and pursue sexual relations. This is more so considering that the number of respondents who had accurate knowledge about how HIV was sexually transmitted and how infection could be prevented stood at an overall rate of just under 27% (Shisana et al. 2013).

Health risks pertaining to school-going and university age groups, together with the gender component, have to be especially mentioned at this stage. In previous studies conducted in South Africa, risk behaviours ranging from smoking, sexual risk behaviour, alcohol consumption to physical inactivity and unhealthy eating patterns were common among children and youth, and the sex dimension in their prevalence was noticeable (Bradshaw et al. 2010; Reddy et al. 2013). The age group of 15–24 years old reported the youngest mean smoking debut age (Shisana et al. 2013). Again in the age group of 15–24 years old, just over 26% of males and 50% of females were found to be physically unfit.

Females in the younger age groups seem not to be faring well as far as health risk behaviours are concerned (Bradshaw et al. 2010). Take for instance sexual risk behaviour. Young females aged 15–24 years accounted for around 24% of all new HIV infections, and the HIV incidence rate in this group was more than four times higher (2.5 vs. 0.6%) than the incidence rate found in their male counterparts (Shisana et al. 2014). In the same research report by Shisana et al., Black African females who were in the age group 24–35 years of age were among populations at higher risk for HIV infection, with an HIV prevalence rate of just under 32%. Shisana et al. (2014) also reports that almost 40% of all females aged 15–19 years stated that they have been involved in an intimate relationship with a partner more than 5 years their senior. Unsurprisingly, among the sexually active individuals in 2012, almost 40% males reported having more than one sexual partner in the preceding 12 months, and only just over 8% females reported same. On the other hand, the rates of new infections were 1.7 times higher in female respondents than in males among the 15–49-year-old age group.

The occurrence of risk behaviours, in spite of efforts to minimize them, has prompted researchers to search for protective factors. According to risk-taking models such as Jessor's (1992), religiosity is a potential protective factor associated with various health risk behaviours among university students (Rostosky et al. 2007; Sinha et al. 2007). Religious prohibitions and convictions may dissuade students from engaging in health risk-taking, and immersion in certain religiosity-motivated practices can be a health protective factor (Garcia et al. 2013; Koenig 2012). Studies found that religiosity promotes sexual behaviours such as the delay of coitarche (maintenance of virginity) (Mbotho et al. 2013; Rostosky et al. 2004), minimal engagement in sexual activity, the use of a condom (Gyimah et al. 2014; Zaleski and Shiaffino 2000), and avoidance of involvement with a high number of lifetime or multiple sexual partners (Gold et al. 2010; Nicholas and Durrheim 1995).

Beyond sexuality, varieties of religiosity are negatively associated with either taking up smoking or smoking reduction and complete cessation (Nonnemaker et al. 2006). Similarly, some aspects of religiosity are negatively associated with substance and drug abuse (Bartkowski and Xu 2007; Gomes et al. 2013; Rose et al. 2015; Steinman 2008). Religious benefits have also been found in respect of physical activity and diet (Henderson and Ellison 2015; Kim and Sobal 2004; Tan et al. 2014). Although many aspects of religiosity tend to deter health risk behaviours (Hart et al. 2004; Koenig 2012; Peltzer et al. 2016; Roff et al. 2005), it is the more personally oriented motivations of religiosity, commonly known as intrinsic religiosity, that appear to serve the purpose best (Mashegoane et al. 2012).

Intrinsic religiosity refers to a religious orientation where the concerned individual engages in religion for its own sake. A person who is intrinsically oriented in religion is likely to organize and mobilize personal beliefs and life activities around it. This is different to extrinsic religiosity, an orientation where religion merely serves extra-religious, personal, and social purposes. Whereas the former implies a complete integration of religion in one's life activities, the latter can reduce to dutiful activities such as the attendance of religious services to secure the benefits of being a member of a religious community (Ahrold et al. 2011). The relationship of religiosity orientation to health risk behaviours tends to follow a pattern where intrinsic and extrinsic religiosity are, respectively, negatively and positively associated with the behaviours (Haerich 1992; Rowatt and Schmitt 2003). Intrinsic religiosity seems to achieve its effect by promoting self-control (McCullough and Willoughby 2009), and suppressing impulsivity, a trait associated with a number of the health risk behaviours (cf. Caribé et al. 2015).

Although intrinsic religiosity is commonly associated with less risky health behaviours and positive health outcomes, there are studies that also found a positive relationship between the variable and some health risk behaviours (e.g. lack of physical activity, nutrition risk behaviour; Peltzer et al. 2016). Compounding the confusion, both intrinsic and extrinsic religiosity were positively related to sexual abstention in Zaleski and Shiaffino (2000). The present study examines the relationship between intrinsic religiosity and a number of health risk behaviours among Black South African university students. The aim is to clarify, particularly in an African context, the relationship between the variables of intrinsic religiosity and health risk behaviours. We expect that intrinsic religiosity will be negatively related to alcoholic consumption, sexual risk behaviour, cigarette smoking, marijuana/dagga use, physical inactivity, and the daily consumption of unhealthy foods.

Method

Sample

Data for the study were collected from 335 Black African students, conveniently sampled from a student body of a historically Black university in Limpopo, in the north-eastern part of South Africa. The final sample stood at 333 since two participants were eliminated because of their married status at the time of data collection. Thus, all participants were single, and 52.8% (177) female. The mean age of the sample was 20.088 years (SD = 2.662; range = 16–35 years). Most of the participants (78.5%) lived in the university's halls of residence, 9.6 and 7.2% were renting a dwelling on their own or with friends, respectively, outside campus, and 4.8% lived at home with their families of origin. The participants were recruited from three main faculties of the university, namely Law and Management Sciences (31.9%), Humanities (35.8%), and Science and Agriculture (32.2%).

Procedure

Once the study protocol was approved by the Research and Ethics Committee of the University of Limpopo, available lecturers from all three faculties of the university were approached to provide time for participant recruitment at the end of their respective lectures. Students whose lecturers provided time were recruited. They were briefed about the study, which was briefly explained as an evaluation of students' religiosity and how they approached issues of personal health and safety in their lives. Effort was made not to make them aware of the associations subsequently to be fathomed out between the variables of the study. Prospective participants were given opportunity to ask questions of clarification before agreeing to take part. They were also informed that participation in the study was voluntary. Those who consented to participate were also made aware of their rights as research participants, such as the right to withdraw from the study at any time, confidentiality, and anonymity. Finally, prospective participants were required to complete a consent form just before completing the study questionnaire. Once they did that, they were then provided with a questionnaire to be completed in their own time or in group settings where time was available during a lecture. One of the researchers was always available to answer further questions of clarification during data collection. Participants handed in their completed questionnaires once they were done. Those who completed them away from the lecture halls returned them to one of the researchers whose office number was provided on the cover page of the questionnaire.

Measures

Demographic Questionnaire

The demographic details collected from participants included age, gender, domicile, university housing, and the area of study at university.

Intrinsic Religiosity Revised Scale (Gorsuch and McPherson 1989)

The Intrinsic Religiosity scale of Gorsuch and Venable's (1983) Age-Universal Intrinsic/Extrinsic Revised scale (Gorsuch and McPherson 1989) was administered to evaluate intrinsic religious orientation among students. Items measuring intrinsic religiosity include: "*It is important to me to spend time in private thought and prayer*" and "*My whole approach to life is based on my religion.*" They are measured on a five-point scale ranging from *Strongly disagree* (1) to *Strongly agree* (5). The scale's reliability in this study was modest at $\alpha = 0.539$, but it was useful. Although Gorsuch and McPherson (1989) obtained a relatively high reliability for the intrinsic religiosity scale, reliability levels for the extrinsic religiosity components were in the modest range (0.58 for the Es, 0.57 for the Ep). Therefore, it is possible to obtain low reliability levels for the intrinsic religiosity scale. Besides, the scale was successfully used with a different population in the same region (Mudau et al. 2011).

Health Risk Behaviours

The National College Health Risk Behaviours Survey questionnaire (NCHRBS; Centers for Disease Control and Prevention 1997) was adopted for use in this study. Health risk behaviour aspects covered included consumption of alcoholic beverages, sexual risk behaviour (infection with a sexually transmitted disease and experience with sexual intercourse), the smoking of cigarettes, the smoking of marijuana (dagga), engagement in physical activity, and the consumption of healthy foods daily (CDC 1997). We limited the questionnaire to variables with immediate relevance to the present study. Marijuana was qualified as dagga, another common term for the substance in South Africa. The NCHRBS is a well-established survey used by many higher education institutions in the USA and is gaining popularity in other countries where it is referred to and/or adapted for use (e.g. da Franca and Colares 2010; Reddy et al. 2010). Dinger (2003) evaluated the reliability and validity of the NCHRBS physical activity items. Dinger obtained intraclass correlations ranging from .94 to .99 and established a positive association between the NCHRBS physical activity items and the direct measures of physical activity. The original format of the NCHRBS from the CDC informed the adaptation of the instrument used in the South African surveillance system and its early formats (Reddy et al. 2013). This means that the NCHRBS has some construct validity in the South African context.

Results

Preliminary Analysis

All data analyses were conducted using the International Business Management Statistical Package for Social Sciences, version 23 (IBM SPSS 23; IBM Corporation 2015). Univariate outlier detection analysis of the intrinsic religiosity variable identified four participants as outliers. These were removed from subsequent analysis. Then, intrinsic religiosity scores were used to divide the sample into four quartiles, and the results of this process are presented in Table 1. Quartiles divide the sample according to different levels of intrinsic religiosity, from the smallest to the largest mean reports of the variable. They

Table 1 Means and standard deviations of health risk behaviours by quartiles for intrinsic religiosity

Health risk behaviour	Intrinsic religiosity			
	1st quartile ($N = 76$) $\bar{X}$(SD)	2nd quartile ($N = 91$) $\bar{X}$(SD)	3rd quartile ($N = 71$) $\bar{X}$(SD)	4th quartile ($N = 97$) $\bar{X}$(SD)
Alcohol intake	8.49 (4.331)[a]	7.02 (4.011)	6.72 (3.888)	5.68 (3.350)[b]
Sexual behaviour	14.47 (5.188)[a]	14.00 (5.222)[a]	13.15 (5.242)	11.38 (5.094)[b]
Tobacco use	14.00 (8.223)[a]	11.22 (5.517)[b]	12.37 (7.198)	10.54 (4.925)[b]
Marijuana use	4.91 (3.692)[a]	3.63 (2.047)[b]	3.63 (2.173)[b]	3.61 (2.008)[b]
Physical activity	15.47 (6.482)	15.88 (6.456)	16.18 (7.102)	14.48 (5.530)
Daily consumption of healthy food	17.13 (2.265)	17.52 (2.321)	17.13 (2.267)	17.12 (2.306)

All $df = 2, 328$. Means in the same row sharing the same superscript are not statistically different from each other, and those with different subscripts differ statistically

facilitate analysis, in that they make it easy to compare the health risk involvement of individuals who report rather different levels of intrinsic religiosity.

Two-Way Analysis of Variance Test Results of Health Risk Behaviours with Intrinsic Religiosity

Analysis was done using a 2 (Gender) × 4 (Intrinsic religiosity) ANOVA to test the relationship between intrinsic religiosity levels and various health risk behaviour scores (alcohol use, sexual behaviour, tobacco use, marijuana use, engagement in physical activity, and the consumption of healthy foods daily). The interaction effect of gender and the levels of intrinsic religiosity, on the amount of alcohol consumed by the students, was not statistically significant, $F(3, 327) = 2.159$, $p > .05$. An elucidation of the lack of significance of the probability value is provided by the *partial* η^2 which was .019 in this case, a negligible value. The *partial* η^2 quantifies the magnitude of difference between the variables and permits an evaluation of the meaningfulness of their relationship. This is how we will use the statistic throughout the analyses. A low value, such as the one obtained for the interaction effect, suggests that the relationship is not meaningful. There was also no gender main effect, $F(1, 327) = 0.519$, $p > .05$, *partial* $\eta^2 = .001$. However, the main effect of the levels of intrinsic religiosity on the amount of alcohol consumed by the students was statistically significant, $F(3, 327) = 2.731$, $p < .05$, *partial* $\eta^2 = .024$.

There was also no interaction effect, $F(3, 327) = 0.143$, $p > .05$, *partial* $\eta^2 = .001$ of gender and the levels of intrinsic religiosity, on the number of risky sexual behaviours engaged in by the students, and there was no gender main effect, $F(1, 327) = 0.442$, $p > .05$, *partial* $\eta^2 = .002$. Nevertheless, there was a significant main effect of intrinsic religiosity, $F(3, 327) = 6.197$, $p < .001$, *partial* $\eta^2 = .054$. Another ANOVA was conducted to investigate the smoking variable. The interaction effect of gender and the levels of intrinsic religiosity, on the use of tobacco by the students, was not statistically significant, $F(3, 326) = 0.213$, $p > .05$, *partial* $\eta^2 = .002$. But there was a statistically significant main effect of intrinsic religiosity, $F(3, 326) = 2.908$, $p < .05$, *partial* $\eta^2 = .026$, and a gender main effect, $F(1, 333) = 8.178$, $p < .01$, *partial* $\eta^2 = .024$.

Marijuana use was also investigated. The interaction effect of gender and the levels of intrinsic religiosity, on the use of marijuana by the students, was not statistically significant, $F(3, 334) = 0.709$, $p > .05$, *partial* $\eta^2 = .004$. However, there was a statistically significant main effect of both gender, $F(1, 334) = 6.423$, $p < 0.01$, *partial* $\eta^2 = .019$, and intrinsic religiosity, $F(3, 334) = 4.805$, $p < .01$, *partial* $\eta^2 = 0.042$. Regarding physical activity, there was a statistically significant interaction effect of gender and the levels of intrinsic religiosity, on the amount of physical activity the students engaged in, $F(1, 327) = 2.687$, $p < .05$, *partial* $\eta^2 = .024$. There was also a statistically significant gender effect for the same health risk behaviour, $F(3, 334) = 5.893$, $p < .05$, *partial* $\eta^2 = .01$. Nevertheless, there was no main effect of intrinsic religiosity, $F(3, 334) = 1.493$, $p > .05$, *partial* $\eta^2 = .014$. For the consumption of healthy foods daily, the interaction between gender and the levels of intrinsic religiosity, $F(3, 327) = 0.721$, $p > .05$, *partial* $\eta^2 = .004$, intrinsic religiosity main effect, $F(3, 327) = 0.566$, $p > .05$, *partial* $\eta^2 = .005$, and gender main effect, $F(1, 327) = 1.518$, $p > 0.05$, *partial* $\eta^2 = .005$ had no statistically significant impact.

The mean scores for all the comparisons are presented in Table 1. The Scheffe post hoc test was conducted to compare the health risk behaviour mean scores of the created groups (quartiles). Similar superscripts in Table 1 imply that the means are not statistically different from each other, and dissimilar means denote the opposite. Thus, there were no statistically significant differences in the mean scores of students who reported different levels of intrinsic religiosity on engagement in physical activity and the daily consumption of a healthy diet ($p < .05$). This means that the levels of engagement in physical activity and the consumption of a healthy diet did not differ for all students whatever their level of intrinsic religiosity. On the other hand, students who reported the lowest levels of intrinsic religiosity obtained statistically different mean scores of alcohol consumption when compared to students who reported the highest levels of intrinsic religiosity ($p < .05$). The former engaged in relatively more alcohol-related health risk behaviours. The first two groups reporting low intrinsic religiosity obtained the highest tobacco-related health risk behaviours when compared to the group that reported the highest mean score of intrinsic religiosity ($p < .05$). Finally, the group reporting the lowest mean score on intrinsic religiosity scored the highest on the health risk behaviour associated with marijuana use ($p < .05$).

The results of two-way ANOVA were in a way substantiated by Pearson product-moment correlation coefficient analysis. Intrinsic religiosity correlated negatively with the use of alcohol ($r = -.21$, $p < .001$), sexual behaviour ($r = -.25$, $p < .001$), the use of tobacco ($r = -.15$, $p < .01$), and marijuana use ($r = -.19$, $p < .001$), but was not related to both engagement in physical activity and the daily eating of healthy foods ($r = -.04$ and $.04$, $p > .05$).

Discussion

This study had as its overall goal the examination of the association between intrinsic religiosity and health risk behaviours among Black South African university students. It intended to clarify the relationship between the two variables. Although evidence suggests that intrinsic religiosity relates negatively with health risk behaviours, there were instances where different results were obtained such as when Peltzer et al. (2016) reported that it was positively associated with physical activity and nutrition risk behaviour. The results in this

study show that intrinsic religiosity is largely an important factor to consider in an attempt to minimize the students' engagement in health risk behaviours. There was a relationship between intrinsic religiosity and four (namely alcohol use, sexual behaviour, tobacco use, and marijuana use) of the six health risk behaviours included in this study. Yet, it was surprising that there was no interaction between gender and intrinsic religiosity, and gender did not on its own influence the experience of many of the health risk behaviours. Since there is evidence to suggest that intrinsic religiosity is a gendered experience (Bryant 2007) and gender influences the experience of health risk behaviours (Hunter 2007; Pithey and Morojele 2002; Shisana et al. 2014), the reasons for the lack of interaction would have to emanate from somewhere else, such as in the nature of the sample. This point is explored below.

While the results were generally consistent with the extant literature, there were also unique elements. The negative association between intrinsic religiosity and both tobacco and marijuana use, and the gender effect on each of the two substances is in line with existing research (Fletcher and Kumar 2014; Gomes et al. 2013). Follow-up *t* test analyses (results not reported) showed that males obtained higher scores for tobacco ($t = 3.005$, $df = 298.31$, $p < .003$, $d = .34$) and marijuana ($t = 2.777$, $df = 280.35$, $d = .31$) use. Once more, the results are expected since drug use is most prevalent among males in South Africa (Parry and Pithey 2006).

The students' religiosity levels were also negatively related to alcohol intake and sexual behaviour (Reed and Myers 1991). Nonetheless, lack of gender effect on alcohol intake and sexual behaviour is contrary to the trends in the South African literature (Reddy et al. 2013; Shisana et al. 2014). Males are more likely to use alcohol than females (Pithey and Morojele 2002), and females are more likely to engage in sexually risky behaviours than males (Hunter 2007; Shisana et al. 2014). Females in South Africa are exposed to sexual risk because of their economic and related vulnerabilities (Chatterji et al. 2005; Hunter 2007; Jewkes and Morrell 2011). It could be that there were no gender differences in this student sample because the women were a special group who may have survived, escaped or overcame the vulnerabilities suffered by their non-student counterparts. Comparisons with non-student males and females need to be undertaken in South Africa since they may produce different results.

The absence of direct influence of intrinsic religiosity on students' physical activity and daily diet is contrary to expectation (Kim and Sobal 2004; Tan et al. 2014). Yet, there are studies where intrinsic religiosity had no influence on students' engagement in physically demanding activities and the diet they consume (Harcrow 2010; Kim and Sobal 2004). In fact, some studies did find that religiosity actually hampers engagement in physically demanding activities and the consumption of unhealthy diets (Koenig 2012; Peltzer et al. 2016). In another study, it was extrinsic rather than intrinsic religiosity that was associated with healthy eating (Hart et al. 2004).

Lack of association between intrinsic religiosity and physical activity is a complex issue. While there was no direct association between the two variables, gender seems to play an important role. Just as Kim and Sobal (2004) suggested, a better way of determining the role of gender in the relationship between religiosity and physical activity needs to be found. On the other hand, the association of religiosity and the consumption of healthy foods daily can be explained by the context in which the students in this study find themselves. Most higher education students are at a stage of development where they experiment with new ideas and are going through developmental periods psychosocial theory refers to as psychological moratoria (Erikson 1997). During those periods, they appear to be influenced immensely by ideas floated by different quarters in the university

environment. In the process, they may also depart from seemingly conservative ideas, such as those peddled in some religious dogmas. Add to this the considerable reduction in the parents' capacity to monitor activities such as eating and religious participation itself (Koenig et al. 2008).

Therefore religion, in comparison with peer pressure, may play less of a role in determining the type of food students consume away from home at university. Eating fast foods as opposed to home-type meals is normative among university students. This means that personal factors such as religiosity compete with contextual pressures to influence eating habits in a university context. In the present study, only intrinsic religiosity was measured. It will be interesting to see what the outcomes will be when extrinsic religiosity is included in future studies. The study by Hart et al. (2004) shows that extrinsic religiosity may in some situations lead to healthy eating.

Limitations

The reported findings are not without limitations. Given that we used a cross-sectional student sample, it is unclear if these results would generalize beyond the used population. As such, there is a need to replicate this research with non-student populations and with longitudinal designs. The design must incorporate other forms of religiosity, such as quest and extrinsic religiosity to compare the performance of the constructs.

Conclusion

The results add support to the notion that religiosity somewhat protects against engagement in health risk behaviours. The findings confirm that the more personally integrated, intrinsic religiosity is an important factor in the reduction of health risk behaviours. Therefore, the design of interventions should incorporate, among other factors, the promotion of the importance of religiosity in the students' lives. However, it appears that this approach may not yield results as far as combating physical inactivity and unhealthy eating. The findings also suggest that interventions should not necessarily be gender specific. The findings challenge the role of gender in most of the health risk behaviours.

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