

A Predictive Model for Physical Activity, Healthy Eating, Alcohol Drinking, and Risky Driving Among Albanian Youth

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Abstract

Studies report an increasing prevalence of health risk behaviors among Albanian adolescents and young adults. The Problem-Behavior Theory provides a useful framework for explaining both health-compromising and health-enhancing behaviors by considering several personal and environmental factors. The present study used a model with seven independent variables including age, gender, attitudes, locus of control, risk behavior tendency, stress, and parent/peer models of health behavior to predict two health-compromising behaviors (alcohol drinking and risky driving) and two health-enhancing behaviors (physical activity, healthy eating) in a sample of 347 Albanian young adults (157 men and 190 women, $M_{age} = 20.42$, $SD = 1.48$). The measuring instrument was based on the Health Behavior Questionnaire developed by Jessor, Donovan, and Costa. Results showed that the model explained 26.1% of the variance in risky driving behavior, and the significant predictors included, risk behavior tendency, gender, and attitude toward health. These same three variables also significantly predicted drinking behavior, explaining 16.8% of the variance. Also the model explained 14.2% of the variance in healthy eating behavior and the significant predictors included, models of significant others, gender, locus of control, attitude toward health, and age. Finally, the only two significant predictors for physical activity were risky behavior tendency and perceived stress, which accounted for 13.2% of the variance. Findings are discussed in the context of suggestions for future research and practical implications for policy making.

Keywords

health behavior, nutrition, physical activity, substance use, behavioral theories, college health

Introduction

Health Behaviors and the Problem-Behavior Theory (PBT)

Research on health behaviors and their determinants has been quite selective in terms of mainly focusing either on external environmental factors or internal individual determinants of behavior; for instance, while studies have shown that external influences such as modeling may be very important in the context of smoking or drinking behavior (e.g., Sancho, Miguel, & Aldás, 2011; White, Johnson, & Buyske, 2000), internal determinants such as locus of control seem to have crucial importance in the context of engagement in physical activity or healthy eating (e.g., Helmer, Kramer, & Mikolajczyk, 2012). Certainly, the consideration of personal and environmental variables separately constitutes a major limitation to the proper understanding of the overall context in which health behaviors are established. Moreover, research has shown that although separately considered in studies, both personal and environmental variables are involved as predictors of health behavior (Cairney, Kwan, Veldhuizen, & Faulkner, 2014; Silva, Lott, Mota, & Welk,

2014). Another argument along these lines is the repeatedly found relationship between the several health behaviors themselves (i.e., individuals engaged in physical activity also have a healthy diet; conversely, smoking and drinking also go together); hence, it might be expected that they also have common personal or environmental predictors (although the relevance of the specific predictors might vary on the specific behavior; for example, Kwan, Cairney, Faulkner, & Pullenayegum, 2012). The identification of common predictors for different health behaviors has an important practical relevance especially as regards health behavior interventions, that is, they might target simultaneously factors related to more than one behavior (Hingson, Zha, Iannotti, & Simons-Morton, 2013).

In this context, the PBT (Jessor, 1991) provides a useful theoretical framework for understanding health behaviors in

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terms of interplays between personal and environmental factors. Although PBT was not originally a health-behavior theory, it has proved to be quite successful in explaining a wide range of health risk behaviors among adolescents and young adults, both cross-culturally and longitudinally (Jessor, 2008; Jessor, Donovan, & Costa, 1991; Jessor & Turbin, 2014). More specifically, the theory considers the interactions of three main systems of variables including (a) perceived environmental variables, (b) personality system variables, and (c) behavior system variables. Variables in the environment or personality systems might serve both as controls or instigators of the specific health behavior (Jessor, Turbin, & Costa, 1998). Studies have indicated that the theory is useful in explaining both health-compromising (e.g., drinking) and health-enhancing behaviors (e.g., physical activity, healthy eating; Jessor, Turbin, & Costa, 2010).

PBT Components: Perceived Environmental Variables

The perceived environmental variables comprise two main categories: proximal variables (i.e., variables whose link to the specific behavior is direct) and distal variables (i.e., variables whose link to the specific behavior is not direct but requires theoretical explanations; Jessor et al., 1998). Behavioral models have been considered among the most influential proximal environmental variables; thus, parents' or friends' behavior might promote health-compromising/enhancing behaviors accordingly. Examples might include, alcohol drinking among individuals who have drinking parents or healthy eating among individuals growing up in families with healthy eating habits. On the other hand, models might also inhibit both types of behavior, for example, abstaining from alcohol drinking among individuals whose friends/peer groups do not drink, or having unhealthy eating habits among individuals whose friends/peers eat junk food. Research studies have supported the relevance of family models in the establishment of drinking patterns or eating habits (Birch & Fisher, 1998; Nansel et al., 2013; Nicklas et al., 2001; Schmidt, Morrongiello, & Colwell, 2014; White et al., 2000). Peers also serve as important models influencing health behaviors such as alcohol consumption or physical activity (Sancho et al., 2011; Silva et al., 2014).

Stress, on the other hand, represents an important though distal environmental variable. The relationships between stress levels and health-compromising behaviors are by now widely accepted. More specifically, research has indicated that higher levels of perceived stress are related with increased alcohol drinking, overeating/less healthy eating, and reduced physical activity (Jääskeläinen et al., 2014; Stults-Kolehmainen & Sinha, 2014). Findings have been explained in terms of stress management efforts, for example, drinking or overeating to reduce anxiety levels, negative feelings, and so on (e.g., Park & Iacocca, 2014; Read, Radomski, & Borsari, 2015) or negative stress outcomes (e.g., poor motivation and low energy to engage in physical activity; Gerber, Jonsdottir, Lindwall, & Ahlborg, 2014).

PBT Components: Personality System Variables

Personality system variables include a set of variables both social and cognitive in nature, such as attitudes, general orientations toward the self or society, and so on (Jessor et al., 2010). Relationships between attitudes and behavior have been thoroughly investigated by now (e.g., Ajzen & Fishbein, 1977), although controversy still exists on their relevance of attitudes in the context of other predictors of behavior. As regards the impact of personal risk-taking tendencies on actual behavior, several controversial findings have been reported, for example, either supporting or discarding its relevance (Appelt, Milch, Handgraaf, & Weber, 2011; Lauriola, Panno, Levin, & Lejuez, 2014). Thus, the debate over the respective influence of this variable in the context of other determinants of behavior is ongoing, as research is focusing more and more on the conditions under which one component or the other acquires greater importance (e.g., Kopetz et al., 2014). In this context, the increased specificity in defining risk behavior tendency (i.e., in terms of the specific behavior investigated such as unprotected sex, risky driving, etc.), increases the relevance of this variable as a predictor of health behavior (e.g., Shuper, Joharchi, & Rehm, 2014). Research has provided evidence indicating relationships between variables such as risk motivation and risky driving behavior, sensation seeking and drinking behavior, and so on (Aklin, Luejz, Zvolensky, Kahler, & Gwadz, 2005; Romer, 2010; Wilkinson, Shete, Spitz, & Swann, 2011). Thus, risk orientation seems to be an instigator of health-compromising behaviors such as drinking or risky driving, although its relevance depends also on the other factors investigated. Also, the relationship might not be very straightforward when it comes to health-enhancing behaviors such as physical activity or healthy eating.

Indeed health-enhancing behaviors seem to be better explained in terms of another personality variable, that is, locus of control. Research has supported the relevance of locus of control in explaining health-related behaviors; thus, individuals who believe that they are in control of their behavior and feel responsible for their own state of health (internal locus of control) are engaged in more healthy behaviors than those who think they are not responsible for their health (Helmer et al., 2012; Song & Ling, 2011; Vakefliu, Argjiri, Peposhi, Sejdini, & Melani, 2002). Thus, internal health locus of control seems to be an instigator of healthy eating behavior, and physical activity, while serving as control for alcohol drinking or risky driving behavior.

The Context and Purpose of the Study

The present study uses a theoretically driven predictive model with the purpose of explaining two health-compromising behaviors, alcohol drinking and risky driving, and two health-enhancing behaviors: healthy eating and physical activity in a cross-sectional sample of Albanian young adults. As compared with other European countries, Albania has a

very young population (by 2010, youth up to 18 years old comprised almost 40% of the whole population; Albania Economy Statistic Facts, 2010; World Bank Report, 2006). As research studies indicate, adolescence and young adulthood represent a critical period for the establishment of health behaviors, as individuals move further away from parental control and acquire greater independence in choosing their lifestyles (e.g., kinds of foods they eat, how much they drink, physical activities they are involved, and so on; Eaton et al., 2012; Jessor et al., 1991; Marquis, 2005; Walther, Aldrian, Stüger, Kiefer, & Ekmekcioglu, 2014). In the specific Albanian social context, changes in the political regime (from communism to democracy) have been accompanied with increasing rates of smoking, alcohol and drug use, malnutrition, and unsafe sexual practices as compared with rates in the 1990s (Hajdini, 2009). Moreover, there is a fast increase in the number of traffic accidents in general and fatal accidents in particular among adolescents and young adults; alcohol use has been identified as one of the strongest predictors of this outcome (together with younger age; Qirjako, Burazeri, Hysa, & Roshi, 2008). Most concerning, the long-term negative effects of increasing health risk behaviors are already becoming evident. According to the Albanian Public Health Institute, there is an alarming increase in the prevalence of lifestyle diseases such as cardiovascular diseases, obesity, diabetes, and so on (Family Health International, 2006; Public Health Institute, 2013). In this context, it has been argued that the ongoing reform of the health care system in Albania must place greater focus on prevention (involving the identification and control of risk factors) in addition to patient care (Dumi & Sinaj, 2014). Hence, factors related to or explaining health behaviors need to be identified and addressed properly.

In this context, the present study aimed to examine the impact of (a) perceived environmental variables: models of parents/friends and perceived levels of stress; (b) personality variables: attitude toward health, (internal) health locus of control, and risk orientation on two health-compromising behaviors: alcohol drinking and risky driving, and two health-enhancing behaviors: healthy eating and physical activity. Age and gender patterns for all four behaviors were also examined.

Method

Participants and Procedure

Participants were 347 students of the European University of Tirana, 157 (45%) men and 190 (55%) women, aged between 18 and 22 years old ($M_{age} = 20.42$, $SD = 1.48$). For the purpose of the study, stratified sampling was used, so that the sample reflects the real proportions of first-, second-, and third-level students studying in the three faculties of the

university (Economics, Law, and Social Sciences). Table 1 shows the classification of participants by faculty and level of study.

The study procedure extended over 10 days and was guided by a previously designed scheme taking into account the schedule of classes for each faculty and each level. In collaboration with the university professors, project collaborators entered the classrooms during the last 15 min and distributed the questionnaires together with the informed consent forms. Students were assured of the anonymity and confidentiality of the data and were free to withdraw from the study at any time.

Table 1. Participants by Faculty and Levels of Study.

	First level	Second level	Third level	Total
Faculty				
Law	20	33	21	74
Economics	57	73	65	195
Social sciences	26	30	22	78
Total	103	136	108	347

Measuring Instruments

The measuring instrument was based on the Health Behavior Questionnaire developed by Jessor et al. (1991). Relevant permission was acquired by authors. For the purpose of the study, only parts of the instrument measuring the variables of interest were used. The translation and back-translation method was used to ensure the correct translation of the selected items. Hence, the items were translated into Albanian by two professional translators and subsequently the two versions were back-translated into English by two other professional translators. English versions were compared against each other and the original. Inconsistencies were noted down and addressed in the respective Albanian versions. Both Albanian versions were piloted among 10 students. The respective scores correlated highly ($r = .85$) and students did not report any difficulties with the items. A subsequent discussion with students (focus group) was conducted to resolve the differences in wording between the two versions of the questionnaire (e.g., which version was most clear according to them?) and come up with one final version.

The first part of the questionnaire provided information on participants' age, gender, as well as level and program of study. Healthy eating was measured with four items, with higher scores showing more frequent healthy eating behavior. Examples included, "How often do you eat vegetables/fruit?" The subscale showed good internal consistency ($\alpha = .83$). Driving behavior was also assessed with four items, with higher scores showing more frequent risky driving. Examples included, "During the last 6 months, how often did you drive after having one or two drinks?" This subscale also

had acceptable internal consistency ($\alpha = .77$). Drinking behavior was measured with a single item assessing frequency of getting drunk in the past 6 months, with higher scores showing a higher frequency. Physical activity was also measured with a single item assessing the amount of time spent with different physical activities per week; higher scores indicated more time spent with physical activities.

Attitude toward health/value placed on health was measured with seven items, with higher scores indicating more importance placed on health. Examples included, "How important is it for you to feel in good shape?" The subscale had acceptable internal consistency, $\alpha = .79$. Health locus of control was assessed with four items, with higher scores indicating stronger internal locus of control. Examples included, "If I do things right, it's easy to stay in good health." The subscale had acceptable internal consistency, $\alpha = .70$. Risk behavior tendency was measured with four items, with higher scores indicating a stronger tendency toward risk-taking behavior. Examples included, "In the past 6 months, how often have you done something dangerous just for the thrill of it?" "In the past 6 months, how often have you taken chances with your safety when you were out at night because it was exciting?" This subscale also had acceptable internal consistency, $\alpha = .78$.

Models of behavior were assessed with eight items grouping together parent/peer models of the four behaviors of interest; the scores on the two health-compromising behaviors (drinking/risky driving) were reversed, so that higher scores on the subscale ultimately indicated more healthy models of behavior. Examples included, "Does your mother/father/closest friend pay attention to eating a healthy diet?" The subscale had acceptable internal consistency, $\alpha = .73$. Finally, perceptions of stress were measured with three items assessing reported stress in different settings. Examples included, "In the past 6 months, how much stress or pressure have you felt at home?" Higher scores indicated higher stress levels and the subscale had low but acceptable internal consistency, $\alpha = .69$.

Analyses and Results

Descriptive Analyses

Descriptive analyses indicated that 41.3% of the sample reported they never got drunk in the past 6 months, 50.6% reported this behavior as occurring rarely to sometimes, and 8% reported getting drunk often. In terms of risky driving behavior, 27.6% of the sample reported they never engaged in risky driving behavior in the past 6 months, whereas the remaining 72.4% reported at least one form of risky driving behavior during this time period. In terms of physical activity, only 24.5% of the sample reported not being engaged in

any form of physical activity on a weekly basis. As regards healthy eating behavior, only 1.8% of the sample reported total lack of any healthy eating habits; the rest of the sample reported at least one healthy eating habit (e.g., eating fruits and vegetables), and 26.4% of the sample reported all four listed habits. Descriptive statistics on attitude/value placed on health indicated that only 75.6% of participants considered feeling healthy as "important" or "very important," whereas the remaining 24.4% as little or somewhat important.

Multivariate Regression Analysis

Correlations between the dependent variables indicated that healthy eating correlated positively with physical activity, $r = .16$, $p < .01$, so that individuals following a healthy diet also tended to do more physical activity. Drinking behavior correlated positively with risky driving behavior, $r = .48$, $p < .01$, so that individuals who reported getting drunk more frequently also reported more risky driving behavior.

Considering the multiple dependent variables, which also correlated with each other, multivariate regression was performed with healthy eating, drinking behavior, physical activity, and driving behavior as dependent variables, and gender, age, attitudes, locus of control, risk behavior tendency, models of behavior, and stress perceptions as independent variables. Results showed that the proposed model was better at predicting driving behavior, $R^2 = .261$, followed by drinking behavior, $R^2 = .168$, healthy eating, $R^2 = .142$, and physical activity, $R^2 = .132$. Table 2 indicates only the results that showed statistical significance.

The only significant predictors of risky driving behavior in order of importance were risk behavior tendency, gender, and attitude toward health (see Table 2). These same three variables also significantly predicted drinking behavior (the only difference was that gender ranked third in order of importance). Hence, youth who reported more frequent drinking and risky driving behaviors in the past 6 months, also reported a stronger risk behavior tendency, put less value on health, and were more likely to be men.

The strongest predictor of healthy eating was "models of significant others," followed by gender, locus of control, attitude toward health, and age (see Table 2). Hence, youth who reported healthier eating habits, also reported healthier behavior models (parents and friends); also they were more likely to be women, had stronger internal locus of control, put more value on health, and were older in age. Finally, the only two significant predictors for physical activity were risk behavior tendency and perceived stress (see Table 2). Thus, youth who engaged more in physical activity reported a stronger tendency toward risk behavior, and also lower levels of stress.

Table 2. Multivariate Regression for Healthy Eating, Physical Activity, Drinking Behavior, and Driving Behavior.

Independent variables	Dependent variables	F value	Significance	η^2
1. Age	a. Healthy eating	3.59	<.05	.01
2. Gender	a. Alcohol drinking	4.55	<.05	.02
	b. Healthy eating	6.29	<.05	.02
3. Attitude/value on health	c. Driving behavior	20.53	<.01	.06
	a. Alcohol drinking	5.06	<.05	.02
	b. Healthy eating	4.18	<.05	.01
	c. Driving behavior	4.14	<.05	.01
4. Risk tendency	a. Alcohol drinking	31.48	<.01	.09
	b. Physical activity	19.87	<.01	.06
	c. Driving behavior	48.63	<.01	.14
5. Models of sig. others	a. Healthy eating	19.00	<.01	.06
6. Locus of control	a. Healthy eating	4.18	<.05	.01
7. Stress	a. Physical activity	6.82	<.01	.02

Note. Model for risky driving behavior, $R^2 = .261$; model for drinking behavior, $R^2 = .168$; model for healthy eating, $R^2 = .142$; model for physical activity, $R^2 = .132$.

Discussion

The present study used a theoretical driven model to predict two health-compromising (alcohol drinking, risky driving) and two health-enhancing (healthy eating, physical activity) behaviors in a sample of Albanian youth. Results indicated that the majority of participants reported healthy eating habits, engaged in physical activities, and also reported never or rarely getting drunk. However, as regards risky driving behavior, about 70% of current drivers reported at least one form of risky driving during the last 6 months (speeding up/not wearing seatbelts/crossing with red light, etc.). These results are particularly concerning considering the increasing rates of accident-related deaths in Albania (e.g., Qirjako et al., 2008) and should be also further investigated in future research. Factors, which might promote this massive non-compliance with driving regulations in Albania, should be of major concern. Although this aspect was beyond the scope of the present study, findings provided some explanation of risky driving at least in terms of individual-level factors; indeed, the suggested model proved to be mostly useful in explaining risky driving behavior (as compared with the other three behaviors of interest).

Risky Driving and Drinking Behavior

Both risky driving and drinking behavior were explicable in terms of risk behavior tendency, gender, and attitude toward health. The relevance of these three individual difference variables raises once more the debate of internal versus external determinants of behavior. These findings are in line with existing research finding associations between health behaviors and risk orientation (Aklin et al., 2005; Romer, 2010; Wilkinson et al., 2011). Thus, risk behavior tendency in this case serves as a promoter for both health-compromising behaviors investigated in the study. Male gender is also

an important predictor for both health-compromising behaviors, a finding which is in line with current cross-cultural research (Khan, Cleland, Scheidell, & Berger, 2014; Özkan & Lajunen, 2005; Rhodes & Pivik, 2011; Wilsnack, Vogeltanz, Wilsnack, & Harris, 2000). Conversely, female gender not only serves as a control of health-compromising behaviors but also as an instigator of healthy behavior (e.g., eating habits). These findings are in line with existing research and have been explained in terms of weight control and body image concerns (Leblanc, Bégin, Corneau, Dodin, & Lemieux, 2015).

Healthy Eating Behavior

Apart from gender, attitude toward health (value placed on health) also was relevant in explaining not only the two health-compromising behaviors but also healthy eating behavior. Thus, the value individuals place on health seems to act as a control in the cases of risky driving or drinking behavior, but as an instigator in the case of a health promoting behavior such as healthy eating. Hence, despite the lack of specificity (e.g., Ajzen & Fishbein, 1977), this variable seems to be important across a range of different health behaviors, a finding which has implications especially in terms of prevention/intervention programs addressing attitudes to health. Indeed, in the present sample, almost one fourth of participants considered health to be little or somewhat important and this figure might be much higher in other parts of the population (e.g., in youth who do not have university education). This finding is important considering that Albania is still a country where regular check-ups are still a behavior of the minority, where self-medication is the most frequent form of self-reliance, and professional assessment is limited only to urgent or grave cases (De Soto, Gordon, Gedeshi, & Sinoimeri, 2002).

Apart from gender and attitude, healthy eating behavior was also predicted from behavioral models, locus of control, and age. These findings are in line with research suggesting the importance of family models in the acquisition of healthy behavior (e.g., Nansel et al., 2013; Schmidt et al., 2014; Silva et al., 2014) and the relevance of internal locus of control in health behavior maintenance (e.g., Helmer et al., 2012; Song & Ling, 2011; Vakefliu et al., 2002). In addition, increasing age has also been associated with more healthy eating habits; it has been suggested that increasing age provides the necessary knowledge and control to adopt a healthier lifestyle (e.g., Sijtsma et al., 2012).

Physical Activity

Finally, physical activity was significantly predicted by only two variables, risk behavior tendency and perceived stress. The positive association between risk behavior tendency and physical exercise is a quite controversial finding which needs to be addressed in future research. A possible explanation is that engagement in physical exercise might provide a “healthy” way to manage the individual tendency toward risk taking. However, this proposition cannot be tested in the present research because the study did not assess motives for exercising or the types of physical activities individuals were engaged in (e.g., extreme sports?). On the other hand, the negative relationship between physical activity and levels of stress replicates research suggesting the stress management function of physical activity (e.g., Cairney et al., 2014).

Limitations and Suggestions for Future Research

To summarize, findings indicated that the model did best in explaining health-compromising rather than health-enhancing behaviors. Moreover personal, rather than environmental variables proved to be more relevant in predicting all four health behaviors. Despite its’ contribution in suggesting some of the determinants of health behaviors in the Albanian context, the study also has some limitations which need to be discussed and addressed in future research. For instance, the broad scope of the present study (four different health behaviors) makes it quite difficult to discuss or analyze in depth the particularity of each health behavior. Future research might consider apart from macro-level variables, also behavior-specific variables (e.g., attitude toward drinking, rather than just attitude toward health in general). Along these lines, there are also several methodological shortcomings which need to be acknowledged. First, considering that the sample included students from only one Albanian university, care should be taken in generalizing the findings for the student population in Albania. Moreover, Albanian youth who did not pursue university studies might provide a quite different picture from the one discussed in the present research. Hence, it is suggested that future research should be conducted with more representative samples, where education might also be considered as a variable. Another limitation has to do with

the measure used; it is suggested that future research uses more specific behavioral measures, and avoids single item measures. Nonetheless, despite its limitations, findings of the present study provide useful directions for future research in the area; for instance, a particularly interesting and important problem to address might involve factors explaining the high noncompliance rates with traffic regulations, including country-specific policies, or attitudes toward these policies. Moreover, the controversial findings concerning the relationship between physical activity and risky behavior tendency also need further research; thus, it might be quite interesting to explore the actual function of physical activity in individuals prone to engage in risky behavior. Finally, issues related to gender roles, cultural norms, and health risk behaviors might also represent a fruitful direction for future research in Albania.

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