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DEVELOPING A MODEL OF HEALTH BEHAVIOR INTENTIONS AND ACTUAL HEALTH BEHAVIORS OF KOREAN MALE UNIVERSITY STUDENTS

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ABSTRACT

Background and objective

The purpose of this study was to determine the relationship between health behavior intentions and actual health behaviors by applying the theory of planned behavior (TPB) to Korean male university students.

Material and methods

The participants of this study were students at Kyung Hee University Global Campus in Yongin-si, Gyeonggi-do, the Republic of Korea. The students of this university are high-achieving, motivated students, and the school was ranked within the top 50 Asia-Pacific universities in 2019 as per an assessment carried out by "Times Higher Education," a university assessment organization in United Kingdom. Questionnaires were distributed to 278 male students from Kyung Hee University in January of 2019. Structural equation modeling (SEM) was conducted to predict health behavior intentions and actual health behaviors in this population. Statistical significance was set at $p<0.05$.

Results

Results show that attitudes toward health in Korean male university students was correlated with their health behavior intentions ($\beta=0.463$, $p=0.005$). In addition, subjective norms about health in Korean

male university students did not significantly affect health behavior intentions (β=0.073, p=0.619). Perceived behavior control regarding health in the participants was correlated with health behavior intentions (β=0.542, p<0.001) and actual health behaviors (β=0.745, p<0.001). Health behavior intentions in Korean male university students did not significantly affect actual health behaviors (β=0.151, p=0.108).

Conclusion

TPB provides an advantageous theoretical model to predict health behavior intentions and actual health behaviors in Korean male university students. Physical activity and classes related to health education may increase the impact of perceived behavior controls. Such classes should be provided to effectively improve health behavior intentions and actual health behaviors of Korean male university students.

Key Words: *theory of planned behavior; Korean male college students; health behaviors*

INTRODUCTION

In 2015, global life expectancy was estimated to be 73.8 years for women and 69.1 years for men.[1,2] The idea of male health in modern society integrates broad concepts such as physical health, health behaviors, and lifestyle. This integration is necessary to understand why men do not live as long as women.[3] According to reports from the Korea Centers for Disease Control and Prevention over the last 3 years, the rates of smoking (38.1%) and monthly drinking binges (39%) have decreased slightly for adult males (those over 19 years old). Over the same time period, however, the number of those participating in aerobic physical activity has consistently decreased.[4]

Only 20.8% of Korean university students participate in the recommended level of exercise, even though there are many health advantages to regular physical activity[5–8]; this is considerably lower than that of American university students, whose rate of active activity participation is 52%.[9,10]

The entrance rate to institutes of higher learning is 69.7%. In the Republic of Korea, 65.9% of those entrants are male.[11] These statistics suggest that studying health behaviors (stopping drinking, prohibition of smoking, and physical activity) provides an opportunity to encourage healthier behaviors in this population, which will presumably continue as they age.[12,13]

The most widely studied theory regarding health behavior is the theory of planned behavior (TPB).[14] TPB is a combination of the theory of reasoned action (TRA) and perceived behavior control, which affects attitudes, subjective norms, intention toward action, and behaviors.[15] Originally, Ajzen[16] emphasized that the impact of attitudes toward action was reportedly low in studies because behavior intention is involved in the relationship between attitudes and behaviors. Eventually, he designed the TPB to show that perceived behavior control (also called self-efficacy) plays a crucial role in both intention and behaviors.[17]

Thus, this study aims to apply TPB,[18] which has a high explanation power for health-related behaviors, to predict health behavior intentions and attitudes, subjective norms, perceived behavior control, and actual health behaviors in Korean male university students.

METHODS

Procedures and Participants

This study was approved by the Ministry of Health and Welfare-designated institutional bioethics committee (P01-201901-22-001). Participants

were from Kyung Hee University Global Campus in Yongin-si, Gyeonggi-do, the Republic of Korea; the students of this university are high-achieving, motivated students because in 2019 Kyung Hee University was ranked among the top 50 Asia-Pacific universities as evaluated by "Times Higher Education," an UK institute that evaluates universities. The questionnaire was administered to 300 Kyung Hee University male students in January of 2019, and a total of 278 students (92.7%; 22 unreliable responses were discarded) were analyzed; general participant characteristics are shown in Table 1.

Survey Instrument

The questionnaire that was used as the survey instrument in this study consisted of 29 items in total, including five items of demographic characteristics (grade, major, number of cigarettes smoked per day, amount of alcohol consumed per day, frequency of drinking alcohol each month), four attitude items, four subjective norm items, eight perceived behavioral control items, four health behavior intention items, and four actual health behavior items. Our survey was informed by those created by Ajzen,[17] Park and Kim,[19] Davis et al.[20] and Engel and Blackwell.[21]

TABLE 1 Demographics of the Participants

Participant Demographics		**Frequency (n)**	**Percentage (%)**
Grade	Freshman	80	28.8
	Sophomore	78	28.1
	Junior	71	25.5
	Senior	49	17.6
Major	Social Sciences	89	32.0
	Nature Sciences	77	27.7
	Arts & Sports	112	40.3
Cigarettes per day	No smoking	194	69.8
	5 or fewer	19	6.8
	5–10	29	10.4
	10–20	30	10.8
	20 or more	6	2.2
Drinks per episode (Soju=Korean liquor)	I don't know	40	14.4
	0.5 bottle	50	18.0
	1.0 bottle	89	32.0
	1.5 bottle	29	10.4
	2.0 bottles or more	70	25.2
Drinking episodes per month	Less than 1 day	26	9.4
	1–2 days	89	32.0
	3–4 days	77	27.7
	5–10 days	67	24.1
	10–20 days	13	4.6
	20 days or more	6	2.2
Total		278	100.0

The TPB-related questionnaire items, except for demographic items, were scored on a 5-point Likert scale from 1 (Strongly no) to 5 (Strongly yes). All the questionnaires were deemed reliable, as the Cronbach's α was 0.892–0.917.[22]

Statistical Analysis

The data collected from the questionnaire were handled with IBM PASW 18.0 and AMOS 18.0 (IBM Corp., Armonk, NY, USA). Frequency analysis for demographic characteristics, confirmatory factor analysis (CFA), reliability analysis for the validity and the reliability of the survey instrument, descriptive statistics analysis for normality of data, and Pearson correlation analysis and Structural Equation Modeling (SEM) for examining relationships among setting variables were conducted. The statistical significance was set at $p<0.05$.

RESULTS

Expert Review—Validity and Reliability of the Survey Instrument

As a result of CFA for construct validity of the survey instrument (see Table 2), factor

TABLE 2 Validity and Reliability of Research Tools (Survey Instrument)

Measurement Items	Loading(λ)	SE	AVE	CR	α
Attitude 1	0.788	0.177	0.842	0.955	0.905
Attitude 2	0.860	0.123			
Attitude 3	0.893	0.089			
Attitude 4	0.819	0.143			
Subjective norms 5	0.826	0.121	0.844	0.956	0.899
Subjective norms 6	0.799	0.159			
Subjective norms 7	0.808	0.146			
Subjective norms 8	0.891	0.084			
Perceived behavior control 9	0.652	0.520	0.591	0.909	0.917
Perceived behavior control 10	0.788	0.355			
Perceived behavior control 12	0.718	0.462			
Perceived behavior control 13	0.793	0.445			
Perceived behavior control 14	0.834	0.395			
Perceived behavior control 15	0.867	0.353			
Perceived behavior control 16	0.813	0.446			
Health behavior intentions 17	0.738	0.587	0.700	0.903	0.892
Health behavior intentions 18	0.837	0.217			
Health behavior intentions 19	0.882	0.221			
Health behavior intentions 20	0.887	0.178			
Actual health behavior 21	0.802	0.564	0.595	0.854	0.906
Actual health behavior 22	0.883	0.349			
Actual health behavior 23	0.843	0.464			
Actual health behavior 24	0.844	0.562			

Note. SE=standard error; AVE=average variance extracted; CR=construct reliability; α=Cronbach's alpha; χ^2=659.667($p<0.001$), df=220, comparative fit index=0.916, Tucker–Lewis index=0.904, root mean square error of approximation=0.085.Tested by confirmatory factor analysis and reliability analysis.

loading of the 11th item of perceived behavior control was 0.373, which did not meet the standard for inclusion.[23] For this reason, the 11th item was deleted. Subsequently, this model was adopted after the factor "perceived behavior control" showed a model fit with a Chi-square (χ^2) of 659.667 ($p<0.001$), degree of freedom (df) of 220, comparative fit index (CFI) of 0.916, Tucker–Lewis index (TLI) of 0.904, and root mean square error of approximation (RMSEA) of 0.085. In addition, it can be considered an excellent model, as χ^2 of model fit with regard to goodness-of-fit index was assumed to be reasonable, because it is difficult to meet the provided standard if the sample size is large.[24] The CFI and TLI values were over 0.90, which is an excellent goodness-of-fit score, and the RMSEA value met the standard,[25] under 0.10, which was suggested by Browne and Cudeck.[26] Thus, construct validity and convergent validity were secured as the model's scores for several tests were appropriate, with factor loading (0.652–0.893), average variance extracted (AVE; 0.591–0.844), and construct reliability (CR; 0.854–0.956). Also, as a result of correlation analysis (see Table 3), the correlation coefficient value was 0.175–0.767, which is under 0.85, a standard value securing discriminant validity for meeting standards of measurement independence.[27,28] Thus, the overall validity and reliability of survey instrument in this study were secured.

Test for Normality

As a result of examining skewness and kurtosis to identify normality of the used data, the model is shown to meet conditions for normal distribution, as seen in Table 3.[29]

Structural Equation Modeling

Maximum likelihood (ML) was used as a parameter estimation method of SEM, and it satisfied the goodness-of-fit criterion suggested by Browne and Cudeck[26] and Hu and Bentler,[25] as the results were $\chi^2=686.324$ ($p<0.001$), df=222, CFI=0.912, TLI=0.899, and RMSEA=0.087. Further, the SEM between attitudes, subjective norms, perceived behavior control, participation intention, and actual participation behaviors, variables of TPB, are shown in Table 4 and Figure 1.

First, as a result of SEM, the attitude toward health in Korean male university students significantly affected health behavior ($\beta=0.463$, $p=0.005$). Second, subjective norms toward health in Korean male university students did not significantly affect health behaviors ($\beta=0.073$, $p=0.619$). Third, perceived behavior control in Korean male university students significantly was affected health behaviors ($\beta=0.542$, $p<0.001$) as well as actual health

TABLE 3 Correlation Analysis and Normality of Data

	1	2	3	4	5
Attitude	1.000				
Subjective norms	0.767**	1.000			
Perceived behavior control	0.495**	0.413**	1.000		
Health behavior intentions	0.588**	0.496**	0.746**	1.000	
Actual health behaviors	0.288**	0.175**	0.726**	0.658**	1.000
Mean	4.528	4.583	3.966	4.084	3.468
Standard deviation	0.595	0.563	0.875	0.853	1.147
Skewness	−0.982	−1.094	−0.670	−0.982	−0.255
Kurtosis	−0.027	0.134	−0.074	1.273	−0.959

***p<0.01, tested by Pearson correlation analysis and descriptive statistics analysis.*

TABLE 4 Structural Equation Modeling

Items	Path			Standard Coefficient (ß)	C.R.	Results
1	Attitude	→	Health behavior intention	0.463**	2.794	Adopted
2	Subjective norms	→	Health behavior intention	0.073	0.497	Rejected
3-1	Perceived behavior control	→	Health behavior intention	0.542***	9.420	Adopted
3-2	Perceived behavior control	→	Actual health behavior	0.745***	7.859	Adopted
4	Health behavior intention	→	Actual health behavior	0.151	1.606	Rejected

*Note. CR=critical ratio, ***p<0.001, χ^2=686.324(p<0.001), df=222, comparative fit index=0.912, Tucker–Lewis index=0.899, root mean square error of approximation=0.087.**p<0.01, ***p<0.001, tested by structural equation modeling.*

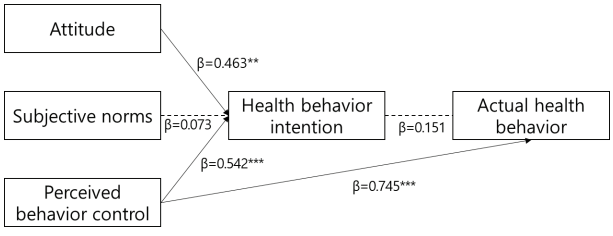

FIG. 1 Predicted model of the health behavior intention and the actual health behavior of Korean male college students.

behaviors (β=0.745, p<0.001). Fourth, health behavior intentions in Korean male university students did not significantly affect actual health behaviors (β=0.151, p=0.108).

DISCUSSION

The life and health of men are connected to race and ethnicity, including social, political, economic, and cultural meanings.[30] This means that men's cognition and behavior patterns toward health differ according to nation and culture. The purpose of this study is to determine the relationship between health behavior intentions and actual health behaviors by applying TPB to Korean male university students.

First, attitudes and intentions are strongly related to health behavior intentions in this study, supporting the idea that attitude is important with regard to intention.[17,31] Previous studies related to meta-analysis have shown that attitude and perceived behavior control significantly affect intention, and they are the most important variables for predicting physical activity. Since attitude contains a personal element, universities can help students adopt positive health attitudes and behaviors by using audiovisual aids to encourage activity or offering equipment which facilitates exercise.

Second, the subjective norms in Korean male university students did not significantly affect health behavior intentions. A previous study regarding subjective norms and intention using the TPB showed that subjective norms have a lower explanation power compared to attitude and perceived behavior control.[32,33] Attitude is a personal element, whereas subjective norms are social elements.[31] This means that individual behaviors are decided not by individuals but by favorable and negative attitudes through standards created by a reference group.[15] From this point of view, it is assumed that the social factors of subjective norms do not offer enough persuasive power to determine health behavior intentions. Thus, a plan to reinforce attitude and perceived behavior control can be a proper strategy to improve health behavior intentions of Korean male university students.

Third, perceived behavior control in Korean male university students showed significant correlation with health behavior intentions and actual health behaviors.[17,34] This finding coincides

with the results of a previous study showing that perceived behavior control has a higher impact on intention than attitude does have.[35] Moreover, Ajzen[16] described the idea that perceived behavior control is directly linked to actual control without any intention. This means that perceived behavior control is decided by individuals through factors, such as the existence of resources and opportunities to practice behaviors, expected interruptions, and the power to control promoting and avoiding behaviors. Thus, an effective health behavior program, including both health behavior intentions and actual health behaviors, should be suggested to improve perceived behavior control for Korean male university students.

Fourth, it was shown that health behavior intentions of Korean male university students did not significantly affect actual health behaviors. Webb and Sheeran[36] also found a discordance between intention and behaviors through a meta-analysis of 47 studies about such relationships. Similarly, this study found that there is a difference between intention and behaviors, and the explanation power of intention to predict actual behaviors is low,[37–39] showing that intention does not always lead to behavior.[40] Most people who have decided to participate in desirable health behaviors regularly fail to follow through on what they had intended.[39] Thus, it is necessary to examine the mediated effects between health behavior intentions and actual health behaviors in Korean male university students regarding reinforcing perceived behavior control. This could lead to actual health behaviors and to an increase in the explanation power between intention and behaviors, resulting in improvements in the health behavior in Korean male university students.

This study has some limitations. It is difficult to generalize the results of this study to the entire population of Korean male university students, as only 278 male university students from the Kyung Hee-university participated. In addition, there is a limitation regarding the characteristics of the survey study, as there was a lack of thorough control for external variables. There are many factors related to health behaviors, including mental, social, and environmental factors. Thus, it is necessary to conduct a well-designed study that considers health behavior and includes variables related to health behavior, resulting in an empirical study that can promote health behaviors in Korean male university students.

CONCLUSION

TPB provides an advantageous theoretical model to predict health behavior intentions and actual health behaviors in Korean male university students. Thus, education classes covering physical activity and health education that can increase perceived behavior control in universities could improve health behavior intentions and actual health behaviors of Korean male university students.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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