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

Sung-Un Park, PhD\(^1\), Hyunkyun Ahn, PhD\(^2\), Wi-Young So, PhD\(^3\)

\(^1\)Associate Professor, Department of Sports & Leisure Studies, Shingyeong University, Hwaseong-si, Republic of Korea
\(^2\)Assistant Professor, Sports & Leisure Studies, Art and Health Department, Myongji College, Seoul, Republic of Korea
\(^3\)Full Professor, Sports and Health Care Major, College of Humanities and Arts, Korea National University of Transportation, Chungju-si, Republic of Korea

The corresponding two authors (Hyunkyun Ahn and Wi-Young So) contributed equally to this work

Corresponding Authors: Hyunkyun Ahn: ahnhk@mjc.ac.kr, Wi-Young So: wowso@ut.ac.kr

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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 (β=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. 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. 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.

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; this is considerably lower than that of American university students, whose rate of active activity participation is 52%. The entrance rate to institutes of higher learning is 69.7%. In the Republic of Korea, 65.9% of those entrants are male. 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.

The most widely studied theory regarding health behavior is the theory of planned behavior (TPB). 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. Originally, Ajzen 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.

Thus, this study aims to apply TPB, 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 Yonin-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, Park and Kim, Davis et al. and Engel and Blackwell.

#### 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

| 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; χ²=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 ($\chi^2$) 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 $\chi^2$ 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 Cudeck26 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 increased 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 behaviors.

### TABLE 3 Correlation Analysis and Normality of Data

|          | 1   | 2   | 3   | 4   | 5   |
|----------|-----|-----|-----|-----|-----|
| Attitude | 1.00|     |     |     |     |
| Subjective norms | 0.767** | 1.00|     |     |     |
| Perceived behavior control | 0.495** | 0.413** | 1.00|     |     |
| Health behavior intentions | 0.588** | 0.496** | 0.746** | 1.00|     |
| Actual health behaviors | 0.288** | 0.175** | 0.726** | 0.658** | 1.00|
| 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.
Health behavior intentions and actual health behaviors

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The life and health of men are connected to race and ethnicity, including social, political, economic, and cultural meanings. 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. 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. Attitude is a personal element, whereas subjective norms are social elements. This means that individual behaviors are decided not by individuals but by favorable and negative attitudes through standards created by a reference group. 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. This finding coincides

### TABLE 4 Structural Equation Modeling

| Items                  | Path                                      | Standard Coefficient (β) | 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<0.01, χ²=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. 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.

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Third, perceived behavior control in Korean male university students showed significant correlation with health behavior intentions and actual health behaviors. 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.\textsuperscript{35} Moreover, Ajzen\textsuperscript{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\textsuperscript{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,\textsuperscript{37–39} showing that intention does not always lead to behavior.\textsuperscript{40} Most people who have decided to participate in desirable health behaviors regularly fail to follow through on what they had intended.\textsuperscript{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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**REFERENCES**

1. Alvinius A. Gender differences in different contexts. Croatia: IntechOpen; 2017.
2. World Health Organization. World health statistics 2016: monitoring health for the SDGs, sustainable development goals. Ginebra: World Health Organization; 2017.
3. Craig G, Anthony I, Timothy ER. A review of men’s health and masculinity. Am J Lifestyle Med 2008;2(6):474–87. https://doi.org/10.1177/1559827608323213
4. Korea Centers for Disease Control and Prevention. Korea Health Statistics 2017: Korea National Health and Nutrition Examination
Survey (KNHANES VII-2) (in Korean). Korea Centers for Disease Control and Prevention; 2018.

5. Bassuk SS, Manson JE. Epidemiological evidence for the role of physical activity in reducing risk of type 2 diabetes and cardiovascular disease. J Appl Physiol 2005;99(3):1193–204. https://doi.org/10.1152/japplphysiol.00160.2005

6. Kohrt WM, Bloomfield SA, Little KD, et al. Physical activity and bone health. Med Sci Sports Exerc 2004;36(11):1985–96. https://doi.org/10.1249/01.MSS.0000142662.21767.58

7. Leith LM. Foundations of exercise and mental health. Morgantown, WV: Fitness Information Technology; 2010.

8. Sigal RJ, Kenny GP, Wasserman DH, et al. Physical activity/exercise and type 2 diabetes. Diabetes Care 2006;29(6):1433–8. https://doi.org/10.2337/dci06-0910

9. American College Health Association. American College Health Association—National College Health Assessment II: Reference Group Data Report Spring 2010. Linthicum, MD: American College Health Association; 2010.

10. Kim YB, Park CM, Kim HH, et al. Health behavior and utilization of university health clinics. J Korean Soc School Commun Health Educ 2010;11:79–91.

11. Korean Educational Development Institute & Korea Ministry of Education. Korea Basic Statistics of Education 2018 (in Korean). Korean Educational Development Institute & Korean Ministry of Education; 2018.

12. Kim B, Cheon SH. Relationship between collegiate student exercise intention and leisure-time physical activity: the mediating role of action and coping planning. Korean J Phys Educ 2019;58(1):217–28.

13. Sheeran P, Webb TL. The intention behavior gap. Soc Pers Psychol Compass 2016;10:503–18. https://doi.org/10.1111/spc3.12265

14. Godin G, Kok G. The theory of planned behavior: a review of its applications in health-related behaviors. Am J Health Promot 1996;11:87–98. https://doi.org/10.4278/0890-1171-11.2.87

15. Fishbein M, Ajzen I. Belief, attitude, intention and behavior: an introduction to theory and research. Reading, MA: Addison Wesley; 1975.

16. Ajzen I. From intentions to actions to actions: a theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), Action control: from cognition to behavior. Heidelberg: Springer; 1985.

17. Ajzen I. The theory of planned behavior. Organ Behav Hum Dec Process 1991;50(2):179–211. https://doi.org/10.1016/0749-5978(91)90020-T

18. Conner M, Sparks P. Theory of planned behaviour and health behaviour. Predict Health Behav 2005;2:170–222.

19. Park SU, Kim HY. World taekwondo hanmadang participation intention and actual participation behavior of college students applying the theory of planned behavior. Taekwondo J Kukkiwon, 2018;9(4):161–76. https://doi.org/10.24881/tjk.2018.9.4.161

20. Davis FD, Bagozzi RP, Warshaw PR. User acceptance of computer technology: a comparison of two theoretical models. Manage Sci 1989;53(8):982–1003. https://doi.org/10.1287/mnsc.35.8.982

21. Engel JF, Blackwell RD. Consumer behavior (4th ed.). New York: The Dryden Press; 1982.

22. Nunnally JC, Berstein IH. Psychometric theory (3rd ed.). New York: McGraw-Hill; 1994.

23. Hair Jr JR, Black WC, Babin BJ, et al. Multivariate data analysis (7th ed.). Upper Saddle River, NJ: Pearson Prentice Hall; 2010.

24. Byrne BM. Testing for the factorial validity, replication, and invariance of a measurement instrument: a paradigmatic application based on the Maslach Burnout Inventory. Multivariate Behav Res 1994;29:289–311. https://doi.org/10.1207/s15327906mbr2903_5

25. Hu LT, Bentler P. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. Struct Equ Model 1999;6:1–55. https://doi.org/10.1080/10705519909540118

26. Browne MW, Cudeck R. Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), Testing structural equations models. Newbury Park, CA: Sage; 1993.

27. Fornell C, Larcker DF. Evaluating structural equation models with unobservable and measurement error. J Market Res 1981;18(1):39–50. https://doi.org/10.1177/002224378101800104
28. Kline RB. Principle and practice of structural equation modeling. New York: The Guilford Press; 1998.
29. West SG, Finch JF, Curran PJ. Structural equation models with non-normal variables: problems and remedies. In R. H. Hoyle (Ed.), Structural equation modeling: concepts, issues, and application. Thousand Oaks, CA: Sage; 1995.
30. Derek MG. An intersectional approach to men’s health. J Men’s Health 2012;9(2):106–12. https://doi.org/10.1016/j.jomh.2012.03.003
31. Ajzen I, Fishbein M. Understanding attitudes and predicting social behaviour. Englewood Cliffs, NJ: Prentice-Hall; 1980.
32. Culos-Reed SN, Gyurcsik NC, Brawley LR. Using theories of motivated behavior to understand physical activity: perspectives on their influence. In R. N. Singer, H. A. Hausenbles, & C. M. Janelle (Eds.), Handbook of research on sport psychology (2nd ed.). New York: John Wiley & Sons; 2001.
33. Rivis A, Sheeran P. Descriptive norms as an additional predictor in the theory of planned behaviour: a meta-analysis. Curr Psychol 2003;22(3):218–33. https://doi.org/10.1007/s12144-003-1018-2
34. Perugini M, Bagozzi R. The role of desires and anticipated emotions in goal-directed behaviours: broadening and deepening the theory of planned behaviour. Br J Soc Psychol 2001;40:79–98. https://doi.org/10.1348/014466601164704
35. Mohiyeddini C, Pauli R, Bauer S. The role of emotion in bridging the intention-behaviour gap: the case of sports participation. Psychol Sport Exerc 2009;10:226–34. https://doi.org/10.1016/j.psychsport.2008.08.005
36. Webb TL, Sheeran P. Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. Psychol Bull 2006;132:249–68. https://doi.org/10.1037/0033-2909.132.2.249
37. Pfeffer I, Strobach T. Behavioural automaticity moderates and mediates the relationship of trait self-control and physical activity behaviour. J Psychol Health 2017;33:925–40. https://doi.org/10.1080/08870446.2018.1436176
38. Rhodes RE, de Bruijn GJ. What predicts intention–behavior discordance? A review of the action control framework. Exerc Sports Sci Rev 2013;41(4):201–7. https://doi.org/10.1097/JES.0b013e3182a4e6ed
39. Sheeran P. Intention-behaviour relations: a conceptual and empirical review, In M. Hewstone & W. Strobe (Eds.), European review of social psychology (vol. 12, pp. 1–36). Chichester: John Wiley & Sons; 2002.
40. Armitage CJ. Can the theory of planned behavior predict the maintenance of physical activity. Health Psychol 2005;24:235–45. https://doi.org/10.1037/0278-6133.24.3.235