



■ Original Article

Exploring Parents' Participation Decisions on School-Based Health Screenings in Mountainous Regions

Emily Jones¹, Hojun Lee², Kibum Cho^{3,*}

¹School of Kinesiology and Recreation, College of Applied Science and Technology, Illinois State University, Normal, IL, USA

²Department of Rehabilitation Medicine, Seoul National University Bundang Hospital, Seongnam, Korea

³Division of Sport Science, College of Sport and Art, Hanyang University, Ansan, Korea

Background: Increasing the participation rate in health screenings is a major challenge. In West Virginia, USA, where a statewide, state-funded school-based health screening program has been offered to fifth-grade students and their parents/guardians for nearly 20 years, more than 50% of eligible participants consistently opt-out. Consequently, the purpose of this investigation is to determine a parent/guardian's reasons for deciding whether to participate in a school-based health screening.

Methods: A cross-sectional study design was used and a total of 216 parents/guardians of fourth-grade students from 10 elementary schools in the northeast region of West Virginia participated in the study. The survey, based on the theory of planned behavior (TPB), was used to explore a parent/guardian's intentions when opting in or out of a school-based health screening for their child, and included items that represented direct determinants, indirect determinants, and behavioral intentions. Multiple regression analyses were conducted to measure the questionnaire's potential to predict intentions and identify the predictive strength of each direct determinant.

Results: Results show that attitude, subjective norms, and perceived behavioral control in the TPB (43%) provided strong evidence for predicting participation intentions. Specifically, attitude ($\beta=0.73$, $P<0.001$) was the strongest predictor of intention, followed by subjective norms ($\beta=-0.17$, $P<0.01$).

Conclusion: This study suggests that strategies to facilitate positive attitudes and increase parental awareness of health screening initiatives may influence participation rates within community- and school-based programming.

Keywords: Parents; Health; Schools; Intention; Students

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*Corresponding Author: Kibum Cho <https://orcid.org/0000-0002-5025-7571>

Tel: +82-31-400-5744, Fax: +82-31-418-7523, E-mail: rotc11542@hanyang.ac.kr

INTRODUCTION

West Virginia (WV) is the only state in the United States entirely classified as Appalachian country and it is the second most rural state in the United States. Regional and environmental characteristics of Appalachia have been associated with adverse health outcomes, limited access to healthcare services, and poor quality of life.¹ For these reasons, the U.S. Preventive Service Task Force recommended regular health screening for individuals across their lifespan.² However, securing a high participation rate in health screenings is a primary challenge.³ In fact, in WV a statewide, state-funded school-based health screening program has been offered to fifth-grade students and their parent/guardians for nearly 20 years; however, more than 50% of eligible participants consistently opt-out of the free comprehensive screening.⁴

In a study conducted by Harris and Neal⁴ in 2009 to examine participation rates and factors associated with participation, researchers found that parents did not have positive participation intentions about school-based health screenings for their children. Factors reported by them included concerns about weight measurement, preference for family physicians, and concerns about information exposure regarding family lifestyle. Other researchers examining opt-out decisions by parents explored additional factors, such as low perception of any problem, and forgetting the screening appointment.⁵

Despite these findings, the benefits of active participation in school-based health screenings include access to health services, notable economic value (financial and time savings), and improved health over time due to regular preventative care.⁶ In efforts to increase participation rates of school-based health screenings, researchers have attempted various strategies, including the use of colorful consent forms, no-cost participation fees, free family screenings, and results dissemination in colorful, easy to read, and visually appealing formats. Despite such efforts, high opt-out rates persist.

Therefore, additional study is needed to understand parents/guard-

ian's behavioral intentions regarding their children's health and health screenings in order to develop targeted health messages for children and their families. The purpose of this study was to investigate parents/guardians' intentions when deciding for or against participation in a school-based health screening.

METHODS

A cross-sectional study design was used to understand Appalachian parental/guardian intentions for opting-in/out of school-based health screenings. Participants were recruited from 10 elementary schools in the northeast region of WV. Criteria for regional selection was based on the regions' collective representations of the demographic profile of the state (i.e., race, education, and income). The northeast region is 95% White/Caucasian (94% state average), 85% high school graduate or higher (ages ≥25 years) (84% state average), and has a \$41,045 median household income (\$41,043 state median).⁷

The required sample size was determined by statistical power analysis (G*Power 3.1 software; <http://www.gpower.hhu.de/>). This software is used to determine power and ideal sample size. Correlations of $r=0.3$ (medium effect size) were applied because at least a medium effect size has been documented in the literature as reasonable for theory of planned behavior (TPB) studies using a multiple regression analysis.⁸ Based on analysis, a sample size of 80 was identified as acceptable. However, considering the participation rate for school-based health screenings the previous year (26.7%), a minimum of 400 questionnaires would need to be distributed to obtain the desired sample size. Toward this end, 400 parents/guardians with a child enrolled in the fourth grade in the northeast region of WV were invited to participate. The criterion for inclusion were the child's eligibility to participate in the WV Coronary Artery Risk Detection in Appalachian Communities (CARDIAC) Project based on school-based health screenings during the 2016/2017 academic year. A total of 248 questionnaires were re-

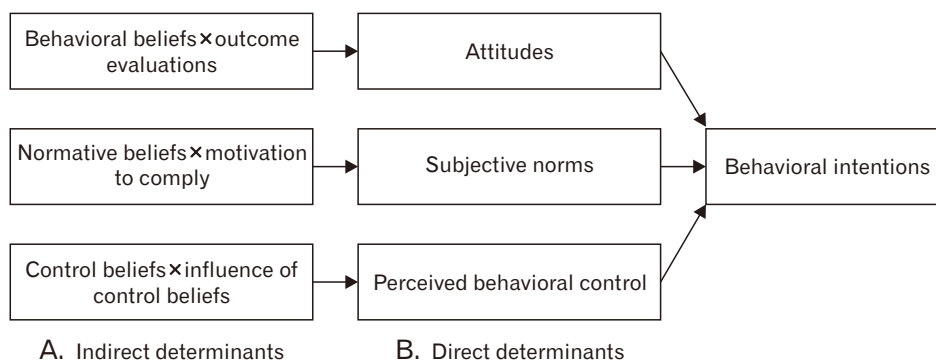


Figure 1. Theory of planned behavior.¹¹ The theory of planned behavior components are presented. (A) Salient behavioral beliefs about the outcome of a particular behavior, weighted by individual evaluation of those consequences (outcome evaluations), form an indirect measure of an individual's attitudes toward the behavior (behavioral beliefs). Salient normative beliefs about whether important peers approve the behavior, weighted by the individual's motivation to comply with those perceived expectations (motivation to comply), form an indirect measure of subjective norms (normative beliefs). Salient control beliefs about facilitators of or barriers to performing a behavior, weighted by their control power (influence of control beliefs), form an indirect measure of perceived behavioral control (control beliefs).^{12,13} (B) Attitudes are an individual's overall evaluation of performing a behavior; subjective norms are social or peer pressures that are perceived by the individual; and perceived behavioral control is defined as the extent to which an individual feels able to perform the behavior.

turned to the researcher (62% return rate). Among them, 32 were removed due to incomplete responses, leaving 216 completed questionnaires to be analyzed.

Ten elementary school administrators and health professionals in northeastern WV agreed to participate in the study. Based on superintendent and principal permission, each school distributed questionnaires to parents/guardians of enrolled fourth-grade students. Participants were given a one-week window to complete and return the paper/pencil questionnaire in the self-addressed stamped envelope provided to the researcher. The first 100 participants who provided their names and mailing addresses on a separate sheet of paper with the returned questionnaire were sent a \$10 gift card for participation. No personal or identifiable information (name or address) was linked to participant responses; this was done only to provide participant incentives. For more accurate data entry, TeleForm Software (Cardiff Software Inc., Vista, CA, USA) was used to classify, verify, and transfer data received from the questionnaire.

1. Measures

This study was designed to assess a parent/guardian's intentions to participate in a school-based health screening using as a framework the TPB. A quantitative, closed-ended survey framed by the TPB was developed following procedures described in Ajzen⁹⁾ and Francis et al.¹⁰⁾ To explore parental/guardian intentions toward opting in and out of a school-based health screening for their child, the questionnaire included items that represented direct determinants, indirect determinants, and behavioral intentions. In 2011, Ajzen¹¹⁾ introduced three direct determinants and three indirect determinants to predict intentions and behaviors within the TPB (Figure 1). The direct determinants include attitude, subjective norm, and perceived behavioral control and have been defined by Ajzen¹¹⁾ as follows: attitudes are the individual's overall evaluations of performing the behavior; subjective norms are social or peer pressures that are perceived by the individual; and perceived behavioral control is defined as the extent to which the individual feels able to perform the behavior. Researchers indicate that each direct determinant is also influenced by an indirect determinant.¹²⁾

Salient behavioral beliefs about the outcome of a particular behavior, weighted by individual evaluation of those consequences (outcome evaluations), form an indirect measure of an individual's attitude toward the behavior (behavioral beliefs).¹³⁾ Salient normative beliefs about whether others would approve the behavior, weighted by

the individual's motivation to comply with those perceived expectations (motivation to comply), form an indirect measure of subjective norm (normative beliefs).¹³⁾ Salient control beliefs about facilitators of or barriers to performing the behavior, weighted by their control power (influence of control beliefs), form an indirect measure of perceived behavioral control (control beliefs).¹²⁾

The researcher followed the nine steps for TPB questionnaire construction as recommended by Francis et al.¹⁰⁾ A brief description of questionnaire construction is provided. First, the population of interest was defined (parents/guardians with a fourth-grade student in the northeast region of WV). Second, the behavior of interest was defined by the elements of 'target, action, context, and time,' as suggested by Ajzen.¹⁴⁾ Third, questions to measure intentions were developed by content experts. Fourth, questions focused on the most frequently perceived advantages and disadvantages of the opt-in/out decision were developed. These items were informed by findings from previous studies that evaluated school-based health screenings. Fifth, regional school health coordinators were consulted to provide insight as to who/what may have the most influence on a parent/guardian's decision to opt-in/out; and items were revised and developed based on this feedback. Sixth, interviews of the WV CARDIAC Project staff were conducted to solicit feedback and input on questionnaire items related to the perceived barriers and facilitators of participation in screenings. Seventh, all items determined by the first six steps were included in the first draft of the questionnaire. Eighth, a pilot test of the newly developed questionnaire was conducted with a group of local parents of fourth-grade children. Editorial changes were applied accordingly. Lastly, internal reliability of each measure was assessed through a second distribution of the questionnaire to the same pilot test participant group.

For the pilot test, a total of 20 parents/guardians of fourth-grade children within a non-study WV county were invited to complete the TPB questionnaire. The questionnaire was distributed to parents/guardians in cooperation with school personnel and participants returned completed questionnaires in self-addressed stamped envelopes to the researcher. Based on the pilot test, minor editorial changes were made to some items. The results indicated high internal consistency within subscales. The final questionnaire included 37 questions (including four demographic questions) positioned on 5-point Likert scale (Table 1). A total of 216 parents/guardians of fourth-grade students from 10 elementary schools in the northeast region of WV participated in the study.

Table 1. Description of and examples from the questionnaire (excluding demographic questions)

Measures	No. of items	Example of question	Scale
Attitudes	9	Overall I think that a school-based health screening is	Very unpleasant to very pleasant
Subjective norms	12	I feel socially pressured to allow my child to participate in a school-based health screening	Absolutely disagree to absolutely agree
Perceived behavioral control	10	I am capable of helping my child maintain or improve his/her physical health	Absolutely disagree to absolutely agree
Behavioral intentions	2	If I should decide to participate in a school-based health screening for my child today, I will allow them to be screened	Definitely will not consent to definitely will consent

2. Statistical Analysis

Descriptive analysis was conducted to explain participant demographic characteristics (gender, age, and ethnicity) and the distributions of TPB determinants. Internal consistency was calculated to measure intentions and direct determinants in TPB. A simple bivariate correlation using a Pearson R test between indirect and direct determinants, and indirect and direct determinants of the same constructs, are reported in Figure 1. Multiple regression analyses were conducted to measure the questionnaire's potential to predict intentions and identify the predictive strength of each direct determinant. IBM SPSS ver. 21.0 for Windows (IBM Corp., Armonk, NY, USA) was used for all analyses.

3. Ethics Approval

This study was approved by the West Virginia University Institutional Review Board (IRB approval no., 1604079108). Also, all participants signed the written informed consent letter before the survey.

RESULTS

1. Reliability and Validity of Items

Reliability analyses were conducted to explore internal consistency between the items measuring each direct variable. Seven items demonstrated poor inter-item correlation with other items measuring the same construct, and these were subsequently removed. Cronbach's α values ranged from good to very good for each construct (0.96 for intentions, 0.92 for attitudes, 0.85 for subjective norms, and 0.83 for perceived behavioral control).

A positive correlation between intention and direct determinants of attitude ($r=0.64$) and perceived behavioral control ($r=0.15$) was found. There was a negative correlation between intention and subjective norms ($r=-0.27$) (Table 2). Additionally, inter-correlations were found between all direct determinants. All indirect determinants were correlated with each corresponding direct determinant.

Table 2. Correlation coefficients (Pearson R) of intentions with direct and indirect determinants (N=216)

Direct determinants	Direct determinants			
	Intentions	Attitude	Subjective norms	Perceived behavioral control
Direct attitude	0.64**			
Direct subjective norms	-0.27**	-0.19**		
Direct perceived behavioral control	0.15*	0.22**	-0.24**	
Indirect determinants				
Indirect attitude	0.45**	0.71**		
Indirect subjective norms	0.53**		-0.19**	
Indirect perceived behavioral control	0.43**			0.3**

*Correlation is significant at the 0.05 level (two-tailed). **Correlation is significant at the 0.01 level (two-tailed).

2. Descriptive Statistics

The majority of respondents were female (81%, $n=172$) and 86% of participants were aged between 30–49 years ($n=186$). As expected, 98% of participants were white ($n=211$) (Table 3). The mean direct and indirect determinants across the sample were as follows: 3.78 and 4.3 for attitudes (on a 5-point scale), 1.99 and 3.98 for subjective norms, 4.61 and 3.78 for perceived behavioral control, and 4.07 for intention, respectively (Table 4). The mean intention was high for participants (mean=4.07), which means that participants were likely to decide to allow their child to participate in the health screening. Only 20% ($n=40$) reported having past experiences with the WV CARDIAC Project screening initiative.

3. Multiple Regression Analysis

Multiple regression was conducted using (1) direct determinants as the dependent variable and indirect determinants as predictive variables, and (2) intention as the dependent variable and direct determinants as predictive variables. The multiple regression analysis revealed that the three direct determinants (attitude, subjective norms, and perceived behavior control) explained 43% of the variance of intention

Table 3. Personal characteristics of participants (N=216)

Characteristic	Category	No. of participants (%)
Gender	Female	172 (81)
	Male	44 (19)
Age (y)	20–29	11 (5)
	30–39	109 (51)
	40–49	77 (36)
	50–59	14 (6)
	≥60	5 (2)
Ethnicity	White	211 (98)
	Others	5 (2)
Income (US\$)	0–29,999	68 (31)
	30,000–59,999	51 (24)
	≥60,000	97 (45)

Table 4. Mean and standard deviation of intentions, Cronbach's α , and determinant differences (N=216)

Variable	Mean±standard deviation	Cronbach's α
Intentions	4.07±0.97	0.96
Direct determinants		
Attitudes	3.78±0.81	0.92
Subjective norms	1.99±0.91	0.85
Perceived behavioral control	4.61±0.49	0.83
Indirect determinants		
Attitude	4.30±0.47	0.68
#1 Behavioral beliefs	3.78±0.77	
#2 Outcome evaluation	4.82±0.39	
Subjective norms	3.98±0.65	0.91
#1 Normative beliefs	4.06±0.67	
#2 Motivation to comply	3.87±0.79	
Perceived behavioral control	3.78±0.51	0.75
#1 Control belief strength	4.06±0.64	
#2 Control belief power	3.09±0.55	

Table 5. Regression analysis: direct determinants as dependent variable and indirect determinants as predictive variables (N=216)

Indirect determinants	B	P-value	R ²
Indirect attitude	1.20	<0.001	0.50
Indirect subjective norms	-0.26	<0.01	0.04
Indirect perceived behavioral control	0.29	<0.001	0.09

for parents to participate in the school-based health screening. All indirect determinants were significant predictors of each corresponding direct determinant: attitude ($\beta=1.20$, $P<0.001$), subjective norms ($\beta=-0.26$, $P<0.01$), and perceived behavior control ($\beta=0.29$, $P<0.001$) (Table 5). In the population sample, attitude was the strongest predictor of intention ($\beta=0.73$, $P<0.001$), followed by subjective norms ($\beta=-0.17$, $P<0.01$). Perceived behavioral control was not significant (Table 6).

DISCUSSION

1. Usefulness of the Theory of Planned Behavior Questionnaire for Predicting Intentions

The questionnaire has several strengths. First, the TPB manual provided practical guidance in the development of the TPB questionnaire for this study. Compared with previous studies that only included direct determinants in TPB, the questionnaire in this study included both indirect and direct determinants to increase its validity. All TPB determinants can be measured directly and indirectly.¹⁴⁾ Indirect determinants are presumed to affect direct determinants. We performed a Cronbach's α test to measure internal reliability, and found that internal reliability for intention and direct determinants was very high (95% confidence interval, 0.83 to 0.96). Correlations between intention and direct determinants were found to be satisfactory. However, correlations between intention and perceived behavioral control were relatively weak. The small effect size reported in perceived behavioral control may be attributed to the low response rate and insufficient statistical power, or to a weak relationship with intention to participate in the school-based screening. Also, correlations between each direct determinant and other direct determinants were found to be very low, which means that each direct determinant independently affects intentions. The relationship between indirect and direct determinants of the same construct showed significant positive correlations with the corresponding determinants, with the exception of subjective norms.

In the regression analysis, each indirect determinant was shown to predict their corresponding direct determinant. The indirect-direct attitude relationship for predictive strength was found to be strong (50%), but indirect determinants of subjective norm and perceived behavioral control were marginally weaker (4% and 9%, respectively). Stead's study revealed that the mean predictive strength of indirect-direct relationship was approximately 25%, so the indirect determinants in the questionnaire can be appropriate for understanding the direct determinants—thus, revealing construct validity of the questionnaire.¹⁵⁾ However, as recommended by previous studies, the somewhat

Table 6. Regression analysis: intention as dependent variable and direct determinants as predictive variables (N=216)

Direct determinants	B	P-value	R ²
Direct attitude	0.73	<0.001	0.43
Direct subjective norms	-0.17	<0.01	
Direct perceived behavioral control	-0.05	0.68	

weak predictive strength of corresponding indirect determinants, especially subjective norms and perceived behavioral control, will need to be investigated in further research.¹⁶⁾

2. Attitude and Subjective Norms: Strongest Predictors of Intention to Participate

The mean scores for intention, direct determinants, and indirect determinants were consistent overall. The intention to participate in school-based health screenings was found to be high (4.07 on a 5-point scale). Furthermore, mean scores for the direct determinants of attitudes and perceived behavioral control were moderate to high (3.78 and 4.61, respectively), which is interpreted as indicating parents/guardians had a favorable attitude and perceived behavioral control regarding the decision to participate in the screening; whereas the direct determinant of subjective norms was very low (1.99), implying that parents/guardians perceived little to no social pressure to participate in the screening. The mean scores for the indirect determinants reflected high positive attitudes towards participation, moderate to high positive social pressures when deciding on participation, and a moderate to high positive perceived behavioral control. The questionnaire's overall predictive strength of intentions was found to be good (43%). These findings are consistent with, or better than, those of previous studies using TPB to predict health behavioral intentions.¹⁷⁾

The results of this study provide considerable support for the efficacy of TPB in predicting parents/guardians' participation intentions. The most important positive predictor of intention was attitude ($P<0.001$), followed by subjective norms ($P<0.01$). Perceived behavioral control was not a predictor of intention within this sample population ($P=0.68$). These findings suggest that parents/guardians who have more favorable attitudes toward participating in school-based health screenings are likely to encourage their children to participate in future screenings. According to a meta-analysis of screening programs,¹⁸⁾ attitude was the strongest TPB predictor of health screening participation, which is consistent with the results in this study. Considering participants' regional and environmental uniqueness, this study did not find unique results; rather, it was consistent with other descriptive cross-sectional studies using TPB to predict health screening participation.^{19,20)} Therefore, strategies to help parents/guardians navigate the decision-making process of allowing their children to participate in health screenings should be implemented.⁴⁾ However, a limitation of this cross-sectional study was that it did not include data indicating the ultimate opt-in/out behavior of participants.

Interestingly, parents/guardians who reported more social pressure

were less likely to allow their child to participate. In other words, social pressure provided by friends, teachers, doctors, and the community did not increase intentions, but rather had the reverse effect. This result is in contrast to the theoretical assumption behind TPB that suggests increased social pressure will encourage people to have positive intentions.²¹⁾ A probable explanation from previous studies is that participants who were recruited from general practices and hospitals had stronger relationships between intentions and subjective norms than those recruited within school settings. This may be in part a reflection of the strength of relationships with and influence of health professionals and physicians.¹⁸⁾ The health screening in this study was school based, so parents may have faced less social pressure from school teachers or nurses than they would have outside a school setting.

Second, regional characteristics of Appalachians may contribute to these unique results. Previous studies indicate that people in urban areas report greater social pressure for health behaviors than their rural counterparts.^{22,23)} The Commission on Social Determinants of Health pointed out that risky behaviors such as substance abuse, smoking, and violence have negative effects on health behaviors and beliefs of peers and family members.²⁴⁾ According to several health reports, 41.5 per 100,000 adults in WV die from drug overdose, which was the highest national rate in 2015. Further, 26.7% of WV adults smoke cigarettes, ranking 2nd highest in the nation in 2014.^{25,26)} These data suggest that the location of recruitment (Appalachia) may contribute to study findings of a negative relationship between parents/guardians' intentions and social pressure. If this finding were to be substantiated, additional community-based efforts (e.g., campaigns, seminars) focused on health behaviors and behavioral change may positively impact not only the health outcomes of adults, but also provide social pressures/influence to engage in preventative health behaviors and intentions.

In this study, perceived behavioral control had limited effect on parental/guardian intentions to participate in health screenings. Perceived behavioral control refers to participants' perception of the level of difficulty (easy or hard) in deciding to participate in screenings, and how, if at all, external (e.g., participation opportunity and limited time and money) and internal factors (e.g., emotion, ability, and personal knowledge) affected their perceptions.²⁷⁾ Considering previous research, we may interpret these findings as having two probable explanations: limited participation opportunities and high response rates. One important result of this study indicates that only 20% of all parent/guardians have had other health screening experiences. The previous study indicated that lack of prior experience was associated with participants' lower intentions.²⁸⁾ However, the mean score of intention to opt-in from this study was quite high, although participation rates of screenings from 2013–2014 and 2014–2015 were 27.3% and 26.7%, respectively. This discrepancy may be caused by the fact that how one answers a question in a survey does not necessarily determine how they would act in a real situation. Therefore, further longitudinal research efforts are needed to explore factors influencing intention and actual participation.

3. Limitations

There are several limitations in this study. First, the TPB questionnaire is based upon self-reporting, and hence our findings are subject to misclassification. Second, the sample was heavily Caucasian (approximately 90%). Therefore, future studies should include diverse parent populations. Third, the data for this analysis were cross-sectional; further longitudinal analyses are needed to examine the relationship between behavior intention and actual behavior within this Appalachian population.

4. Conclusions

The findings of this study highlight the importance of parents/guardians having positive attitudes and awareness of health screenings in increasing participation rates in the Appalachian region. However, parents who reported greater social pressure were less likely to allow their child to participate in the school-based health screening. We speculate that this unique result may be caused by regional characteristics. Thus, strategies such as group seminars and awareness campaigns may be appropriate for providing social pressure that encourages parents/guardians (and their children) to participate in health screening initiatives.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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ORCID

Emily Jones: <https://orcid.org/0000-0002-3319-1267>

Hojun Lee: <https://orcid.org/0000-0002-3362-2987>

Kibum Cho: <https://orcid.org/0000-0002-5025-7571>

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