Original Article

Effects of gender, age, race, and socioeconomic status on parents' perception of school-based health screening in the United States: Coronary Artery Risk Detection in Appalachian Communities (CARDIAC) study

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Abstract:

Purpose: The purpose of this study was to provide opt-in and –out information of school-based health screening to lay the foundation to increase participation rate in school-based health program. **Methods:** A total 217 parents with elementary students and 6 school nurses in West Virginia, U.S participated in this study (August 2016 to October 2016). Chi-square was employed to analyze differences in personal characteristics and parents' perception of school-based health screening. Open-ended answers from school nurses were utilized and applied to build categories as qualitative analysis. **Results:** 77% of parents had positive perception of school-based health screening for their children. The chi-square test revealed that gender (female), age (younger parents), and education (higher education status) factors were positively associated with parents' participation, while race and income were not significant. School nurses concluded that opt-out reasons originate from bad experiences (n=5), lack of information (n=3), and fear of drawing blood and weight measurement (n=3). Also, advantages of school-based health screening were disease prevention (n=4) and free report on the child's health (n=4). Main decision-maker was child's mother (n=5). **Conclusion:** Gender, age, and education are the factors affecting participation in school-based health screening, while race and income have little impact. It is suggested that health professionals should include personal characteristics as opt-in strategies before they distribute a consent form to parents. In particular, it is recommended to develop strategies to induce a greater participation rate for male, old parents with low educational background.

Key Words: School; Health screening; Health professional; Parents' perception

Introduction

West Virginia is the second most rural state in the U.S. and the only state entirely classified as Appalachia (Alkadry, Wilson, & Nicholas, 2006). These features not only affect the individual development process but decrease access to healthcare services affecting the quality of life (Chenoweth & Galliher, 2004). According to National Vital Statistics Report in 2011, cardiovascular disease is the top cause of death and is usually generated by physical inactivity, stress, and obesity in the U.S (Kochanek, Xu, Murphy, Miniño, & Kung, 2011). Despite the health risks, people still tend to psychologically underestimate health risks. For example, one study revealed that over half of parents have a tendency to consider their children to be within normal condition although they are medically in the range of obesity (Harris & Neal, 2009). This phenomenon is more prevalent in West Virginia (WV) due to various reasons. Therefore, it is emphasized that proper strategies to induce parents' awareness to their child' health status should be developed.

Among diverse strategies, health screening at school is considered significantly important because students can save money and time if they timely receive treatment (Kaiser Family Foundation, 2013) and most students aged 5 to 17 are enrolled at school, making it possible to regularly manage students' health for over ten years (Resnicow, 1993). For these reasons, school-based health screenings have been continually emphasized, but approximately half of those who had an opportunity to take the comprehensive screening from Coronary Artery Risk Detection in Appalachian Communities (CARDIAC) Project have opted out since the health screening initiated (Harris & Neal, 2009). Researchers have tried to use many strategies such as colorful consent form, free participation fee, and feedback using visual effects to increase participation rate of school-based health screenings. Despite these efforts, many parents have not still been favorable to consenting to health screening participation for their children. Therefore, it is important to develop various and effective strategies to promote participation rate (Rukstalis & Hauer, 2011). The purpose of this study was to provide opt-in and –out information of school-based health screening to lay the foundation to increase participation rate in school-based health program.

Material & methods

Material & methods provide sufficient information in the text or by reference to other work to permit the submitted work to be repeated without the need to communicate with the authors. Relevant validity and reliability data should be provided for critical methods. State the type of statistical tests used. Include the number of observations and the statistical findings when appropriate. Parametric and nonparametric statistics must be used as appropriate.

The main contents which are to be presented:

Participants

Total 500 parents with elementary students and 14 school nurses in WV from August 2016 to October 2016 were invited to participate in the research. All students were eligible to participate in school-based health screening in fall 2016 and parents decided whether their child opts in of the health screening. The screening was annually implemented and was designed to privately measures height, weight, and blood pressure. And a small sample of blood was drawn for the risk of heart disease.

Procedure

Participant recruitment was assisted by Coronary Artery Risk Detection in Appalachian Communities (CARDIAC) Project director in WV. Paper-based survey was provided to parents through school teachers and was directly returned to the research team after parents completed the survey.

Instruments

The survey included 6 questions (gender, age, race, education, income, and parents' perception of school-based health screening). Also, school nurses completed web-based survey. Five open-ended questions, developed by CARDIAC Project team, were provided to explore reasons of opt-in or –out of school-based health screening, school nurses' perception of school-based health screening, and decision-maker to allow students to participate in school-based health screening. Among distributed paper- and online-based surveys, 217 valid paper-based surveys (43.7%) were returned. And 6 school nurses completed online-based surveys (42.9%), which were employed as supplementary data to support results from parents' survey.

Statistical analysis

Analysis was conducted using IBM SPSS Statistics ver. 23.0. The chi-square was applied to analyze the effects of gender, age, race, and socioeconomic status on parents' perception on school-based health screening. And open-ended answers from school nurses were added to support quantitative results. All open-ended survey responses were computerized and subjected to a content analysis to build categories; further the number of occurrences within categories was measured for comparative purposes (Silverman, 1993).

Results

Of the parents, 77% had positive perception of school-based health screening for their children while 23% had negative perception. As presented in table 1, the percentage of parents with negative perception of school-based health screening were increased continuously as parents' ages was advanced (age ranges 20-29; 0%, 30-39; 15.3%, 40-49; 20.8%, 50-59; 45.5%, 60 or more; 81.8%). This study also demonstrated that parents' gender could be a significant factor to participation rate as 87.5% of female and 52.3% of male parents wanted their children to participate in health screening respectively. And parents' educational status was also demonstrated as a strong candidate factor to their children's participation rate as higher degree parents are with, higher rate of positive perception of school based health screening is (Less than high school; 38.9%, high school; 63.6%, some college; 82.9%, college; 93.5%, graduate school; 100%). Race and income were not significantly associated with the parents' perception.

Table 1. Chi-square test results comparing parents' perception and personal characteristics in West Virginia, U.S

	Total N=217 N (%)	Will participate in health screening N= 167 N (%)	Will not participate in health screening N= 50 N (%)	<i>p</i> -value ^a
<i>Gender</i>				
Female	152 (70%)	133 (87.5%)	19 (12.5%)	<0.001
Male	65 (30%)	34 (52.3%)	31 (47.7%)	
<i>Age</i>				
20-29	9 (4.1%)	9 (100%)	0	<0.001
30-39	98 (45.2%)	83 (84.7%)	15 (15.3%)	
40-49	77 (35.5%)	61 (79.2%)	16 (20.8%)	
50-59	22 (10.1%)	12 (54.5%)	10 (45.5%)	
60+	11 (5.1%)	2 (18.2%)	9 (81.8%)	
<i>Race</i>				
White	198 (91.2%)	153 (77.3%)	45 (22.7%)	=0.558
Hispanic or Latino	7 (3.2%)	4 (57.1%)	3 (42.9%)	

Black or African American	8 (3.7%)	7 (87.5%)	1 (12.5%)	
Asian/Pacific Islander	4 (1.8%)	3 (75%)	1 (25%)	
<i>Education</i>				
Less than high school	18 (8.3%)	7 (38.9%)	11 (61.1%)	<0.001
High school graduate	66 (30.4%)	42 (63.6%)	24 (36.4%)	
Some college	70 (32.3%)	58 (82.9%)	12 (17.1%)	
College graduate	46 (21.2%)	43 (93.5%)	3 (6.5%)	
Graduate school graduate	17 (7.8%)	17 (100%)	0	
<i>Annual Income</i>				
<\$29,999	67 (30.9%)	55 (82.1%)	12 (17.9%)	=0.454
\$30,000-\$59,999	55 (25.3%)	42 (76.4%)	13 (23.6%)	
>\$60,000	95 (43.8%)	70 (73.7%)	25 (26.3%)	

^a chi-square statistics comparing positive parents' perception and negative parents' perception

School Nurse Survey

Total 6 school nurses completed 5 open-ended questions (Table 2). The first question was that why parents allow their children to participate in school-based health screening. School nurses concluded that parents were interested in child's wellbeing (n=4) and were concerned about child's health (n=4). And some parents emphasized surroundings such as peer pressure around children (n=2) or free screening (n=2) as another reason of participation decision. In contrast, school nurses pointed out that main opt-out reasons originate from bad experiences about health screening (n=5), lack of information about the health screening (n=3), fear of drawing blood and weight measurement (n=3), and personal information exposure (n=2).

Also, school nurses said that advantages of school-based health screening are disease prevention (n=4), free report on the child's health provided by schools (n=4), and health knowledge acquisition (n=2). In contrast, most school nurses replied that there are no disadvantages about the school-based health screening (n=5). Lastly, school nurses said that main decision-maker is generally child's mother (n=5), and only one school nurse mentioned that child is main decision-maker.

Table 2. Summary of school nurses' answers on the school-based health screening

Questions	Answers	Frequency N=6
1 Why do you think parents allow their child to participate in the school-based health screening?	Interested in child's wellbeing.	4
	Concern for child's health	4
	Free screening	2
	Peer pressure from other classmates	2
2 Why do you think parents do not allow their child to participate in the school-based health screening?	Bad experiences (ex. never see results)	5
	Lack of knowledge (ex. dangerousness of high blood pressure and elevated cholesterol)	3
	Fear (ex. lab draw, weight check)	3
	Concern for personal information's exposure	2
3 What advantages exist for parents to allow their child to participate in the school-based health screening?	Disease prevention	4
	Free report on the child's health	4
	Health knowledge acquisition (ex. obesity, cholesterol)	2
4 What disadvantages exist for parents to allow their child to participate in the school-based health screening?	No disadvantage	5
	Difficult to manage/control blood draw	1
5 Who is the primary decision-maker to whether a child participates in the school-based health screening, the child, mother or father? and why?	Mother (ex. understanding entire procedures and managing child's school life)	5
	Child (ex. importance of child's opinion)	1

Discussion

This study indicated that female parents were more favorable to participation in school-based health screening for their children compared to male parents. The result is in agreement with a previous study that female parents play a more significant role in managing their children's health status (Yogman, Garfield, & Committee on Psychosocial Aspects of Child and Family Health, 2016). School nurses in our study supported this idea that mothers, not fathers, are the primary decision-maker for health screening participation and they are more interested in child's school life, which is also supported by a previous study suggesting that male parents

have a greater tendency to focus on their workplace responsibilities instead of home responsibilities such as child care (Yogman, Garfield, & Committee on Psychosocial Aspects of Child and Family Health, 2016). Therefore, it is considered as an acceptable short-range goal to distribute the consent form to female parents to increase children's participation rate of health screening if this strategy can be selectable. However, it should be also noted that the effects of fathers' interest in their children's health is proven greater for their health behaviors (Garfield & Isacco, 2016), leading to a necessity to develop school- or community-based programs to increase male parents' awareness to their children's health as a long-term goal.

Second, younger parents were relatively more favorable to participation in school-based health screening for their children than their older counterparts, which is in disagreement with a previous study showing that old parents have more parenting knowledge which can directly affect child's health (Bornstein, Cote, Haynes, Hahn, & Park, 2010). It is speculated that this discrepancy is originated from different study design. The previous study was designed to compare just two groups of parents (< 20 years old vs. > 20 years old). In our study, parents are stratified into 5 groups ranging in age from 20 to more than 60, which we consider more meaningful to induce conclusion. On top of it, a similar line of study suggested that older parents were less interested in child's school life and wellbeing (Shen et al., 2016). The main reason was found to be generation gap inducing communication breakdown between older parent and child (Vassi et al., 2008), leading to an idea that older parents' indifference is one of the reasons for opt-out of school-based health screening. Therefore, it is advised that experts in the fields of health professions should take into account age gap-induced indifference in initiating school-based health screening.

Third, parents with higher educational status were more favorable to participation in school-based health screening for their children. A study maintained that more educated adults are more likely to explore health information and opportunities, so they can directly improve health (Cutler & Lleras-Muney, 2007). Another study also indicated that a reason for refusing to engage their children in health-related program was associated with limited knowledge and low perception of problem (Taveras et al., 2011). School nurses in this study also supported this idea, showing that 4 of 6 school nurses (66.7%) answered that lack of health-related knowledge is associated with opt-out of health screening. Therefore, it is recommended that, along with consent form, basic medical information be sent to parents, such as method of BMI calculation formula and how obesity leads to cardiovascular diseases.

Fourth, parents' race and income factors were not associated with participation intention. Over 90% of parents in this study were Caucasian, so the data is skewed and limited to explain racial difference in participation intention. This may be one of the limitations in this study. Therefore, future studies need to include diverse parent populations. On the contrary to a previous study demonstrating that parents' annual income is an important factor in children's participation rate (Jang et al., 2007), our study did not show any statistical relationship between these two variables. This might be explained by the fact that our service was provided free of charge but a previous study wasn't, leading to an idea that economic status is not an important factor to participation rate if service is provided under free of charge circumstances, which is also consistent with the result of previous study (Yang, Shin, Hwang, Oh, & Cho, 2013). Therefore, it is considered that budgetary policy in the area of health profession needs to be planned carefully to promote children's participation in school-based health screening. As emphasized above, this study has a limitation that over 90% of parents in this study were restricted to Caucasian, so future studies are warrant to identify racial effects on children's participation rate.

Conclusions

Gender, age, and education are the factors affecting participation in school-based health screening, while race and income have little impact. It is suggested that health professionals should include personal characteristics as opt-in strategies before they distribute a consent form to parents. In particular, it is recommended to develop strategies to induce a greater participation rate for male, old parents with low educational background.

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

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