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Facilitating Factors and Barriers to BMI Screening in Schools

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Research Article

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The National Association of School Nurses advocates for body mass index (BMI) screening. Little research describes school nurse practice of BMI screening. In this descriptive study, 25 Ohio school nurses participated in three focus groups. An adapted *Healthy People 2010* Determinants of Health Model guided the research questions. School nurses engaged in multiphasic data collection which was contingent on physical environment, workload, and referrals. Lack of system policy was key barrier in terms of data collection, referral, and follow-up. A key facilitating factor was physical education teachers in terms of reinforcing health. School size and privacy were components of school physical environment that influenced screening. Recommendations on securing adequate resources are presented. Implications for policy included a salient need for reduced SN workload.

Keywords: BMI; obesity; screening/risk identification; community; elementary; school nurse knowledge/perceptions/self-efficacy; qualitative research

Negative consequences of child obesity have been well documented. Body mass index (BMI) screening for early identification of unhealthy childhood weight is supported by national health agendas and professional organizations (American Academy of Pediatrics, 2003; Colditz et al., 2002; National Association of School Nurses [NASN], 2002; National Institute of Health, 2000; United States Department of Health and Human Services [USDHHS], 2000; United States Preventive Services Task Force [USPSTF], 2005). Each of those agendas or organizations encourages BMI screening of children; however, few policy statements steer postidentification intervention (Hendershot, Telliohann, Price, Dake, & Mosca, 2008). Requisites to screening practice are accurate measure, effective treatment, and referral for follow-up. Discrepancies exist as to when, where, and how often BMI screening of children should take place when there is a no policy to guide practice decisions (Stoddard, Kubik, & Skay, 2008). Because mass screening of children in public school settings is a logical method of detection of obesity, school nurses are in ideal positions to provide BMI screening services (Colditz et al., 2002). Little research is available that describes school nurses' BMI screening practices or that identifies facilitating factors and barriers to BMI screening in schools.

The purpose of the study was to identify facilitating factors and barriers of BMI screening practices among Ohio public elementary school nurses. Six research questions were posed: (a) What are the BMI screening practices of school

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nurses who practice in Ohio public elementary schools? (b) What policy factors serve to facilitate or inhibit school nurses' BMI screening practices? (c) What factors in the physical environment serve to facilitate or inhibit school nurses' BMI screening practices? (d) What factors in the social environment serve to facilitate or inhibit school nurses' BMI screening? (e) What school risk/protection factors serve as to facilitate or inhibit school nurses' BMI screening practices? (e) What access to quality health care factors serves to facilitate or inhibit school nurses' BMI screening practices?

REVIEW OF THE LITERATURE

The USPSTF (2005) recommends obesity screening as part of prevention intervention programming for school-age children. Children aged 6 years and older should be referred to comprehensive, intensive behavioral intervention programs aimed to improve weight status (Whitlock, O'Connor, Williams, Beil, & Lutz, 2010). NASN has supported using BMI to screen child risk for adult obesity (NASN, 2002). However, research investigating school nurse BMI screening practice is sparse.

Moyer, Bugle, and Jackson (2005) investigated school nurses' perceptions of BMI screening practice and identified that follow-up, referral counseling, and parental involvement were major barriers. Hendershot and colleagues (2008) identified that inadequate school resources and inadequate/inappropriate parental responses were the most common perceived barriers to BMI screening practice in public elementary schools. Further, they identified that mandates (state, district, and school) did have a positive influence on the likelihood of school nurses to measure BMI. Policy, environment, risk/protective factors, and access to quality health care were not explored as factors influencing BMI screening of children. Research identifying facilitating factors and barriers that prevent school nurses from effectively screening children affected by obesity is lacking.

THEORETICAL FRAMEWORK

An adapted *HP 2010* Determinants of Health Model (USDHHS, 2001) guided this research (Stalter, 2009). In this adaption, BMI screening is considered the intervention and is assumed to be an evidence-based, accurate measure of health status for school-age children. A relationship between screening policy for obesity, which is determined by international, national, state, local, and school governing agencies and advisory boards, and access to quality health care is posited. School physical environments are comprised of school size, number of students, and ability to maintain confidentiality. School social environments are comprised of parent involvement, teacher accessibility, principal support, school board, cost per pupil spent, and after school programs. School physical and social environments are mediated by risk or protective factors. Risk or protective factors include age/grade level of children, demographics of school community, number of children on school lunches, and number of hours spent in fitness classes. Access to quality health care for school-age children is related to school nurse staffing (nurse to student ratio), available referral sources, and child insurance status.

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METHOD

Three focus groups with 25 school nurses (6–10 in each group) who met the inclusion criteria were convened. Inclusion criteria were (a) member of the Ohio Association of School Nurses (OASN), (b) active registered nurse (RN) license, and (c) employed as a full-time nurse in a public elementary school within the past year in a specified urban, rural, or suburban region of the Ohio. Data were gathered over a 2-year time period (2004–2006). This study was approved by The Ohio State University Institutional Review Board.

Instruments

Focus group protocol included scripts, a demographic questionnaire, and a semistructured list of

TABLE 1. List of Key Focus Group Questions

Item	*Theoretical Component*	*Question*
1	Policy	What policies exist for BMI screening of children in your school systems?
2	School physical environment	What part does school physical environment play in BMI screening? For example: How does the number of students in a building or specific grade level affect BMI screening? How does school size, in terms of square feet influence BMI screening? How does available equipment such as scale, stadiometers, or privacy curtains influence BMI screening?
3	School social environment	What part does school social environment play in BMI screening? For example: How do parents impact BMI screening? Teacher accessibility? Principal support? Community and school board? Cost per pupil? After school programming?
4	Risk & protective factors	What part do school risk and protective factors play in BMI screening? For example, age/grade level; free lunches; Time in physical fitness classes
5	Access to quality care	What part does access to quality care play in BMI screening? Child health insurance affect screening and referral? School nurse staffing available, affordable resources for follow-up
6	Facilitating factors	Can you tell me a few key things that facilitate BMI screening?
7	Barriers	Can you tell me a few important barriers to BMI screening?

questions. Demographic data were nurse characteristics and school characteristics. The theoretical framework guided the development of the focus group questions. Drafts of the questions were reviewed for content validity by two school nurses who were not members of the OASN, and suggested revisions were incorporated into a final list of questions. The questions were open-ended and designed to identify the facilitating factors and barriers that school nurses encounter in BMI screening of children in public elementary school settings. The questions were organized according to the themes of policy, intervention, school physical environment, school social environment, school risk and protective factors, and access to quality health care. Table 1 provides the list of focus group questions.

Procedures

Members of the OSNA ($N = 352$) were informed of the study via an e-mail sent to them by the organization's president. Those interested in participating ($n = 43$) responded via e-mail to the principal investigator. Each was screened for eligibility. Twenty-five (9%) met the inclusion criteria for participation. A final reminder e-mail was sent 48 hours prior to the focus group session by the principal investigator indicating the date, time, and location.

Recommendations of Krueger and Casey (2000) for managing small focus groups were used to guide data collection. Each focus group was moderated by the principal investigator and co-moderated by a doctorally prepared researcher or a doctoral student. All sessions were audiotaped using two tape recorders. The moderator led discussions, and the co-moderator wrote field notes. The demographic questionnaire and informed consent forms were completed by each participant prior to beginning the audio taping. Focus group discussion began immediately after completion of forms. After all focus group questions were discussed, the co-moderator orally presented a summary of the discussion, which allowed the participants to provide feedback to clarify the meaning and terms of the comments made by the school nurses. A $20 gift certificate was given to each participant at the conclusion of the focus group.

Data Management

Immediately following the focus group discussions, recordings were transcribed verbatim into electronic documents by the principal investigator. The documents were validated by reviewing focus group recordings with transcriptions. The co-moderator transposed field notes into electronic versions. To ensure accuracy of transposed data, the moderator and co-moderator electronically exchanged documents to review text. Documents were then entered into Atlas.ti 5.0 for analysis.

Data Analysis

Data analysis was conducted using content analysis, which is an iterative standard procedure

for analyzing transcript interview data (Flick, 2002). Theory-driven categories were used to reduce textual data into themes. Themes were compared within and across transcripts and field notes to enhance the accurate capture of context and meaning. The principal investigator was the primary coder, and the co-moderator was the secondary coder. Discrepancies in coding were discussed in terms of context to reach consensus that eliminated ambiguity and determined emergent themes. Suggestions for improvement were negotiated and resolved by consensus with the moderator and the co-moderator.

Several measures were taken to enhance the rigor of this research (Flick, 2002). Credibility was enhanced by the use of multiple method triangulation using field notes and transcripts to gain deeper meaning of answers to research questions (Golafshani, 2003). In addition, dependability and confirmability were established through review of an audit trail by an experienced doctorally prepared qualitative researcher who examined methods, procedures, and analytic techniques using an audit trail (the study protocol, focus group recordings, field notes, transcriptions, and coding records).

RESULTS

Of the 25 school nurses who participated in the study, all were school nurse certified, 10 (40%) were urban school nurses, 7 (28%) were rural school nurses, and 8 (32%) were suburban school nurses. Most of the participants had OASN memberships for longer than 5 years (60.7%), had at least 5 years of full-time experience as a school nurse in a public elementary school (76%), and held bachelor degrees (64%). Seventy-six percent of the participants were assigned to more than one school and cared for children in kindergarten through sixth grades (96%). Sixty-eight percent reported that most of the children in their primary assigned school were on free/reduced lunches.

BMI Screening Practices

Six themes emerged from focus group discussions regarding BMI screening practices. One school nurse described BMI screening:

> *It takes a tremendous amount of time to get to the point of plotting the data on a health record, with organizing BMI screening concurrent with vision or hearing I can speed the process, but it doesn't matter. Taking a child from overweight to normal is not feasible. I mean, why label a kid fat without a valid plan?*

Complex process BMI screening was described as a "time-consuming" process of delegation, supervision, height and weight data collection, BMI calculation, conversion and plotting, risk identification, referral, and follow-up. An example of this complexity was with regard to BMI calculation. Sixty-eight percent ($n = 17$) of the school nurses described using standard BMI wheels where a 4.5 inch diameter double-sided tool is used to calculate BMI for children. Thirty-two percent ($n = 8$) described using calculators and/or computer software programs to calculate BMI. Both of these methods were described as taking a "great deal of time to calculate and plot." In an attempt to manage time, school nurses used trained aides to gather, calculate, plot, and document BMI.

> *"BMI screening was described as a 'time-consuming' process of delegation, supervision, height and weight data collection, BMI calculation, conversion and plotting, risk identification, referral, and follow-up."*

Method of data collection School nurses discussed a variety of data collection strategies including mass collection, case finding, and multiphasic data collection. Among those who practiced BMI screening ($n = 18$; 72%), the primary method of data collection was multiphasic. Multiphasic data collection was described as "getting heights and weights on all children at the same time state-mandated screenings were obtained." Seven (28%) school nurses stated they did not screen for obesity because "unless a mandate required it to be done, there was no justification for it."

Validity of using BMI School nurses who practiced BMI screening noted the scientific rationale for BMI screening emphasized the need for monitoring growth of children across time for overweight and underweight. School nurses who did not

screen were concerned about false positive results, angry parents, or labeling a child and causing long-term psychological harm. All school nurses considered the BMI to be "an accurate measure of risk." BMI was considered rapid, accurate, and noninvasive; however, lack of effective treatments and referral options for obesity made BMI a futile process that it did not meet criteria for screening established by Center for Disease Control and Prevention. One school nurse described validity of using BMI:

> *If a kid is in the 85th–100th percentile, everyone knows. I can assume the parent knows. My telling them that I calculated the fact isn't going to make a difference. But it may have negative consequences for me, as far as an angry parent goes, or worse for the child.*

Comorbid referrals School nurses who collected BMI data agreed that parent receptivity and student sensitivity to a BMI outside normal limits were concerns. School nurses with 10 or more years full-time employment in schools, ($n = 10$; 40%) shared that they did not refer children at or above 85th percentile for weight status, but they would prompt parental acceptance by a referral for a comorbid concern such as hypertension or high blood sugar. One school nurse described comorbid referral by saying, "I intervene only if the child has exceeded blood pressure parameters and the 85th percentile for weight."

Apprehension There was trepidation about documentation. School nurses were uncertain about what should happen to collected data and how much documentation was necessary to indicate that the health status of a child was addressed adequately. School nurses were also concerned about liability with delegation of a nonmandated screening. The following statement exemplifies apprehension. "I just don't know if having someone else get BMI data is going to get me in trouble later."

Passion School nurses' were passionate about a national epidemic of child obesity. They described child health as antecedent to academic success and adult health. School nurses were appalled by the continued increase in prevalence in childhood obesity and were concerned that child obesity was not an important issue to legislators, school administrators, and society as a whole. School health initiatives to control junk food and soda access, as well as to increase physical activity, were described as not important to the school board's bottom line but high on school nurses' agendas. School nurses felt limited on what they could do to lead school and national health priorities to reduce child obesity.

Policy Factors

Lack of policy and priority health concerns were two themes that emerged with regard to policy factors that have an impact on BMI screening. One school nurse described policy this way: "There is a general lack of policy at all levels. This may change with our ability to identify priority health concerns on wellness plans. National (school nurse organization) is also beginning to take an active role."

Lack of policy School nurse participants were passionate in voicing claims that obesity prevention needed to be addressed at federal, state, local, school system, and individual school levels. Several school nurses questioned whether BMI screening was necessary to do if without a mandate. A lack of policy was considered an important factor in determining BMI screening practice. Discussions about policy involved prioritizing state-mandated screenings (hearing, vision, and scoliosis) over nonmandated screenings. School nurses shared that serum glucose, blood pressure, asthma peak flow, and BMI were not consistently measured in schools because they are not mandated. One suburban school nurse said:

> *I just need a leg to stand on. What if's can eat you up. What if I get sued by an angry parent for not finding an obesity related co-morbidity or because a kid committed suicide because I label him or her fat.*

School nurses expressed appreciation for the national school nurse position statements for addressing child health concerns and school nurse practice.

Priority health concerns School nurses shared that they "hoped changes in school health priorities were coming with wellness plans." They discussed fast food and excessive physical inactivity as priority school health issues, but they thought that schools would not comply with wellness plans unless there was a federal mandate.

School Physical Environment

Confidentiality, school layout, and equipment were three themes that emerged from focus group discussions with regard to school physical environment and impact on BMI screening.

Confidentiality School nurses described how Health Insurance Portability and Accountability Act (1996) compliance was an essential part of screening. School nurses described needing privacy curtains to screen children when on scales so that others could not see the weight or numbers on the scale. School nurses shared that they would trade privacy curtains for other blockades as confidentiality could be maintained. One school nurse said, "There is no way to maintain confidentiality without a curtain."

School layout School nurses identified that the school size, location, or "existence of clinic" affected BMI screening. School nurses described having to go up and down flights of stairs as well as walking outside across parking lots in snow and rain to screen children. They also described long hallways and driving across town or on dangerous roads. School nurses mentioned that it is easier to implement screening programs in smaller schools with clinics, space, or elevators.

Equipment School nurses identified working equipment was necessary for BMI screening. They shared stories about how obtaining equipment for a screening was "a difficult waiting game." For example one school nurses stated, "I ordered a portable stadiometer and I got it a year later." Another school nurse described the waiting game this way: "Mine (scale) broke and I ordered another one, but they won't approve it. If it were a school board election year I'd have it; otherwise I wait."

School Social Environment

Internal environment, external environment, and community interplay were three themes that emerged from focus group discussions with regard to school social environment and impact on BMI screening.

Internal environment Internal communities included teachers, physical education teachers, parents, and principals. One school nurse described by saying, "Teachers are vital for any screening program in the school." Teacher accessibility was described as crucial to height/weight collection because without asking teachers to reinforce details about why the health information is important to obtain, children would not stay focused on the topic of health. School nurses were complimentary of physical education teachers because "... they give up class time for screening" and "some even calculate and track BMI data (for me)." One school nurse emphasized that physical education teachers "go the extra mile for us" and "we appreciate it because without them kids wouldn't have reinforcement on health."

Principal support was described as important for scheduling rooms and resolving conflicts from teachers or parents. A school nurse described conflict this way, "If I come the same day as the Easter Bunny, I am out of luck, with little ones, every day is Santa Day ... health is important ... [the principal] backs me up."

Parent involvement was a problematic topic. About 50% of school nurses preferred parent involvement. One school nurse explained parent involvement with BMI screening, "With an orientation to privacy, I have no problem with parent help, any pair of hands will do!" Others rejected the notion to include them. One school nurse rebutted, "There is absolutely no way I'd permit a parent to help with weight. They gossip too much ... some can be hurtful even though well intended ...." This ambivalence was related to school nurses needing help to complete screenings and a need for confidentiality.

External communities External communities included school board, health care providers, and society. Health care providers and society were not described as having a direct impact on BMI screening. The external school social environment

was described by school nurses as primarily related to school board power. There was consensus that most of the cooperative power needed to carry out BMI screening programs was held by school boards, especially in regard to parental notification of overweight status. School nurses felt that parental opposition to BMI screening undermined administrative support when an implementation policy for screening was absent. An experience one school nurse shared:

> *I will not do BMI screenings this year. I (was) told by the teachers that I should not approach certain students because of parents. This is my first year in the system and I do not know if administration will support me if they hear from an angry parent.*

Community interplay School nurses described community interplay as a "community organization to address child overweight." The school nurses described mixed messages between public education, advertisement, and medical treatment weight management and BMI screening. One nurse stated, "Everyone has their own agenda and some just don't support BMI screening effort." The lack of community interplay was experienced by having a "poor referral pool."

School Risk and Protective Factors

Two primary themes emerged that school nurses felt affected BMI screening. First, the number of children on free lunches and health insurance status of children do not influence BMI screening, regardless of community socioeconomic status. Second, school nurses described, "American fast food" as a culture that influences school health, regardless of geography. School nurses supported the idea that BMI was a "benchmark for school health." They expressed concern that there was "no information coming from state on BMI databases."

Access to Quality Health Care

With regard to access to quality health care, referral, workload, and school nurse were the three themes that influenced BMI screening.

Referral School nurses described that no successful or affordable weight management programs were available to refer an overweight or obese child. Limited availability of referral options affected the decision to practice BMI screening. One school nurse described access limitations, "There are no affordable and successful obesity intervention programs to refer these kids to, so I don't screen for BMI."

Workload School nurses described how a lack of school nurse staffing negatively affected BMI screening process because time was an issue for accuracy with documentation, follow-up, and referrals. School nurses stated that the age of children affected BMI screening as the following comment illustrates: "the little ones take more time, but fifth and sixth graders require a more empathetic approach." Additionally, school nurses described a heavy workload with caseloads that included brittle diabetics on insulin pumps, tube feedings, indwelling urinary catheters, serious food allergies, and inhaler-dependent asthmatics. One nurse described her workload, "I travel 3 buildings and have more than 7500 screenings to accomplish in a year; five thousand have to be done by November 1. There isn't enough of me ...."

School nurse Tacit in the discussions was the idea that school health was a consequence of the school nurse. The school nurses articulated their professional responsibilities in terms of ethical, legal perspectives with a spirit of heroism. One school nurse refuted another school nurse who was not sure about employing BMI screening in her school: "If not you, then who?"

Facilitating Factors

Table 2 presents an overview of facilitating factors and barriers to BMI screening according to adapted *HP 2010* categories. When school nurses were asked to identify a few key factors that facilitate BMI screening, teachers were considered paramount. School nurses explained that teachers provided "access to children." One school nurse suggested that "teachers influence cooperation and provide structure (time-oriented) to the screening program." There was a general

TABLE 2. Facilitating Factors and Barriers of BMI Screening According to Adapted *HP 2010* Categories

Adapted HP 2010 Category	*Facilitating Factors*	*Barriers*
Policy	Professional organization	Lack of federal, state, local, and school policy
BMI screening	Position statement on child overweight	Time-consuming, BMI validity
School physical environment	Working scales, privacy curtains, small enclosed space	Location BMI data gathered, distance between schools, availability of clinic, large school size (square feet), lack of equipment
School social environment	Teachers, physical education teachers, trained aides, community interplay	Grade level/age of children, large number of children in student body
School risk/ protection	BMI as school health benchmark	American fast food culture
Access to quality care	School nurse	Lack of privacy, lack of time, heavy workload, number of schools assigned, lack of school nurse knowledge, resources

consensus that physical education teachers were facilitating factors because they "help with documentation of BMI" and "help with parental notification of BMI results via report cards." The more experienced school nurses suggested trained aides were most helpful with BMI data collecting. School nurses also identified fundamental to accurate data collection was operational equipment, especially scales. School nurses emphasized the need for privacy curtains or small enclosed spaces to gather heights and weights because it facilitated the safeguarding of BMI data. "Community interplay" was shared by school nurses as extremely important in designing successful programs because there is a need for adequate and affordable referrals.

Barriers

When school nurses were asked to identify a few key barriers to BMI screening, workload was the overall most important barrier. Lack of privacy, lack of time, and lack of policy were also key barriers voiced by school nurses.

DISCUSSION

The results of this study indicate that policy, school physical environment, school social environment, and access to quality care as factors that impact school nurse BMI screening practice. Negative impacts or barriers to BMI screening practice are lack of policy, time-consuming data-gathering process, lack of equipment, lack of referral, and school nurse workload. These results are consistent with the findings from Hendershot et al. (2008) that policy influenced the likelihood school nurses will conduct BMI screening and that school nurses identify inadequate resources as barriers to BMI screening. This study uniquely identified factors that facilitated BMI screening by school nurses. Key factors among these were teachers, working equipment, and adequate facilities to conduct the screening.

Approximately two thirds of the participants in this study practiced BMI screening. This exceeds the findings of Moyer and colleagues (2005) in which over half of school nurses used observation to assess for obesity and one third used BMI for age percentiles to assess for obesity. School nurses in this study who did not use BMI screening were concerned that BMI screening did not meet established criteria. That is, adequate treatment programs and affordable referral sources were barriers to screening. Proctor (2009) noted that screening programs such as BMI must validate cost-benefit, successful treatments, and adequate referrals.

School nurses in this study considered BMI as an accurate measure of school health. According to Lundy and Janes (2009), school health measures are indicators of public health. Public health indicators that exceed established benchmarks tax the social systems (Turnock, 2009). The finding that school nurses identified BMI is a measure of school health provides a unique opportunity for creating population-focused school-based prevention intervention programs. Kubik, Story, and Davey (2007) proposed that school nurses are underused in national campaigns against childhood obesity. A critical

component in widespread implementation of BMI screening in schools is having clear, consistent direction for proper BMI screening practice. The NASN Position Statement on Child Overweight was identified as a facilitating factor in promoting school health through obesity screening (NASN, 2002). Although the importance of the position statement was recognized, the lack of school system policy was described as major impedance to BMI screening. School nurses reported school systems would comply with a federal mandate that offered school nurses protection from legal/financial liabilities associated with BMI screening. State initiatives have been developed to address number of hours in fitness class as well as reducing availability of vending machines during school hours. BMI screening would provide a benchmark for evaluation for the initiatives. According to the National Conference of State Legislators (2008), eight states (Arkansas, California, Florida, Illinois, Missouri, Pennsylvania, Tennessee, and West Virginia) have mandated state-level policies for assessing child BMI in schools. To date, no school district in Ohio has adopted BMI screening mandates (A. Connelly, personal communication, February 1, 2010). Effective, February 1, 2010, NASN announced resolution of advocacy efforts for child overweight because the First Lady Michelle Obama announced an initiative to address childhood obesity (NASN, 2010). What impact she will have on a federal mandate for school nurses is forthcoming.

Although it is unclear from the literature what constitutes effective physical layouts for BMI screening, participants in this study identified inadequate space, inadequate privacy components, unusable equipment, and not being in close proximity to physical education teachers as factors that hamper BMI screening. According to Butin (2000), equipment must be reliable and calibrated according to manufacturer recommendations. The need to obtain accurate information with calibrated and functioning equipment is underscored. School nurses in this study identified that using inadequate equipment is considered a barrier to BMI screening practice. Hendershot et al. (2008) also found inadequate equipment as a barrier. Standards of professional performance for school nurses address the school nurse's responsibility in securing resources for a healthy school environment (American Nurses Association and NASN, 2005).

"The finding that school nurses identified BMI is a measure of school health provides a unique opportunity for creating population-focused school-based prevention intervention programs."

Recommendations for securing resources that are consistent with the professional standards are to (a) cost out BMI screening services and include in annual budget; (b) establish networks with other school nurses to borrow needed equipment; (c) establish community partnerships with local health departments, children's acute care facilities, pediatrician's offices, and pediatric nurse practitioners; (d) collaborate with other departments such as athletics to share equipment or budget for needed items; (e) collaborate with state level school nurse consultants; and (f) participate in professional organization.

School nurses in this study described teachers, especially physical education teachers, as a key facilitating factor in BMI screening practice. No other study was identified that supported this key finding. Lightfoot and Bines (2000) identified teachers as gatekeepers to children's access to health care, especially in routine health screening, surveillance, and immunization programs. Teachers and school nurses share complementary roles, which should be strategized to keep school children healthy (Lightfoot & Bines, 2000). The idea of community interplay was identified as a facilitating factor. Peterson and Fox (2007) recommend synergistic approaches implementing multicomponent programs through collaborative teams involving teachers, nurses, parents, and community partnerships.

School nurses in this study described workload as a key barrier in BMI screening practice. According to Ikeda, Crawford, & Woodward-Lopez (2006), there are inadequate numbers of school nurses to manage health screenings. To help school nurses determine feasibility in screening programs, Proctor (2009) emphasized planning which includes anticipation of every detail of the screening program, training screeners, projecting cost per pupil, delegating other assigned

duties, results notification to parents, referrals, treatment, and evaluation. Delegation of BMI screening tasks to unlicensed persons requires school nurses to oversee all supervision and management of assigned tasks (NASN, 2006).

The insight gathered regarding school nurse BMI screening practices yields unanswered questions in each category. Factors described as barriers and facilitating factors need further clarification. Future research is needed to more broadly assess school nurse BMI screening practice and opinions. Based on findings from this study, a survey was developed using the adapted *HP 2010* model to more fully determine school nurse BMI screening practices and to validate emergent themes.

Limitations

This study had limitations specific to sample composition. Self-reported views from a convenience sample of primarily Caucasian females who worked in similar settings, school districts and regions limit transferability and generalizability of findings to all school nurses. In addition, because some participants knew one another, they could have been reticent to share true opinions and practice experiences. It is possible that those who did not participate substantially differed from those who did participate. Finally, participants were limited to OASN members who worked full time in public elementary schools within the past year. Non-OASN members, part-time, retired, and those school nurses who work in other settings (e.g., private, parochial, health departments, junior, or senior high schools) may have significantly different opinions and practice experiences.

IMPLICATIONS FOR SCHOOL NURSE PRACTICE

BMI screening in public schools addressed an important child health issue. This research used the *HP 2010* framework to build theory to investigate BMI screening in the public school environment as a mediator for policy and access to care. The results of this study provide school nurse perspectives about barriers to BMI screening prior to making practice decisions. The findings also provide school nurse perspectives about facilitating factors, allowing an opportunity to accentuate the positive to promote school health through well-planned BMI screening programs.

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