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What Barriers and Facilitators Do School Nurses Experience When Implementing an Obesity Intervention?

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Abstract

A recent evaluation of a school nurse–led obesity intervention demonstrated a 5% implementation rate. The purpose of this study was to explore school nurses' perceived barriers to and facilitators of the intervention in order to understand reasons for the low implementation rate. Methods included semi-structured individual interviews with school nurses. Data were analyzed using content analysis and heat mapping. Nineteen nurses participated and eight themes were identified. Parental and administrative gatekeeping, heavy nurse workload, obesogenic environments, and concerns about obesity stigma were barriers to implementation. Teamwork with parents and school staff was a key facilitator of implementation. Nurses also noted the importance of cultural considerations and highlighted the need to tailor the intervention to the unique needs of their school environment and student population. These findings suggest that for school nurses to play a key role in school-based obesity interventions, barriers must be identified and addressed prior to program implementation.

Keywords

nursing; childhood obesity; qualitative; school health

Introduction

School nurses may be well suited to contribute to school-based obesity interventions due to their clinical expertise, accessibility to students, and ongoing relationship with children and families (Morrison-Sandberg, Kubik, & Johnson, 2011; Pbert et al., 2013; Tucker & Lanningham-Foster, 2015). However, nurses are not commonly involved in these programs. A recent systematic review and meta-analysis found only 11 school-based obesity

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Authors' Note

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interventions in which nurses had a meaningful role; these interventions led to small but statistically significant decreases in body measures for participating children (Schroeder, Travers, & Smaldone, 2016).

The Healthy Options and Physical Activity Program (HOP) is a school nurse–led obesity intervention for children with severe obesity. HOP was developed by experts at the New York City (NYC) Department of Health and Mental Hygiene and implemented in NYC schools starting in the 2012–2013 school year. While the HOP curriculum was designed by Department of Health and Mental Hygiene staff, the program focused on the key health behaviors targeted in the 5-2-1-0 Let's Go program (five fruits/vegetables per day, less than 2 hours of sedentary media use, 1 hour of physical activity per day, and zero sugar-sweetened beverages; Lets Go!, 2012). Let's Go, a community-wide childhood obesity prevention intervention, has demonstrated feasibility (Kessler, Vine, & Rogers, 2015; Polacsek et al., 2009; Rogers & Motyka, 2009), efficacy (Rogers et al., 2013), and sustainability (Polacsek et al., 2014).

HOP eligibility is based upon results of body mass index (BMI) percentile measurement during an annual school fitness assessment (New York City Department of Education, 2015). Parents of students with severe obesity (a BMI for age and gender at 120% of the 95th percentile; Flegal et al., 2009; Kelly et al., 2013) are notified by mail regarding their child's eligibility for the program. HOP can be implemented with passive parental consent. Less than 1 % of parents elect to opt their child out of the program. Nurses select eligible students for HOP implementation; HOP session duration, frequency, and content are also at the discretion of the school nurse, though at least one session every 6 months is required per program guidelines. Sessions may include BMI measurement, health behavior goal setting, and education around sedentary media use, sugar-sweetened beverage consumption, portion size, physical activity, and fruit and vegetable intake. Parents may participate in HOP sessions either in person or via telephone. Prior to program initiation in 2012, all school nurses attended a full-day training which included education on HOP components and implementation as well as an overview of obesity pathophysiology, BMI percentile measurement, and the psychological, behavioral, and cultural influences on obesity. In addition, each nurse was given a binder of HOP resources such as posters and activity sheets to use during HOP sessions.

The delivery and efficacy of HOP during its first year of implementation (2012–2013) were recently evaluated. Of 20,518 eligible kindergarten to fifth-grade students identified with severe obesity, the program was implemented with only 1,054 (5%) despite less than 1% formal parental opt out. The purpose of this study was to explore school nurses' barriers to and facilitators of HOP implementation, with the goal of better understanding the reasons for the low implementation rate. In addition, we hope that lessons learned can inform future school nurse–led obesity interventions.

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Method

All study procedures were approved by the institutional review boards of Columbia University Medical Center, the NYC Department of Health and Mental Hygiene, and the NYC Department of Education.

Participants

A purposive sample of school nurses working in NYC schools was recruited. All NYC school nurses who worked with kindergarten through fifth grade students were eligible, with the exception of nurses who worked exclusively with students who had disabilities or special education needs. Nursing supervisors at the NYC Department of Health and Mental Hygiene Office of School Health provided names and contact information of potential participants. To ensure a broad understanding of school nurses' experiences, nurses with extensive, limited, and no experience implementing HOP within the past year were recruited. Nurses were considered to have "extensive experience" if they implemented HOP with at least six students and to have "intermediate experience" if they implemented HOP with at least one but less than six students during the past school year. Nurses with no experience were recruited because it was important to understand the experience of nurses whose barriers were so great in the current school year that implementation was impossible. In addition, nurses were recruited from three different boroughs of NYC to ensure variation in school community, size, and student population. No specific number of participants was targeted because power analysis is not appropriate for qualitative research (Vaughn, Shay Schumm, & Sinagub, 1996).

Recruitment.—Potential participants' contact information was provided by nursing supervisors at the NYC Department of Health and Mental Hygiene. Eligible nurses were contacted via e-mail or phone to provide information about study purpose, confidentiality procedures, and US$50 Visa gift card incentive and to confirm eligibility. Confidentiality during the interviews was assured. Participants were able to choose interview location and format (phone or face-to-face). Each participant provided signed informed consent including permission to audio record the interview. Participants were reminded about the time and place two days prior to the interview.

Procedure

Interviewing occurred throughout the recruitment period, with each nurse being interviewed as soon as possible after providing consent to participate. Prior to beginning the interview, participants completed a 14-item questionnaire that included basic demographics, nursing education, years of nursing practice, school environment, and prior experience with HOP. Interviews lasted approximately 30 minutes; an additional 15 minutes was devoted to introduction of the study, completion of the demographic questionnaire, and closing. Interview discussion was guided by a 17-item interview guide structured by Reach Effectiveness Adoption Implementation Maintenance (RE-AIM; Glasgow, Vogt, & Boles, 1999; RE-AIM.org, 2015), a framework for evaluating an intervention's translation into practice. The RE-AIM framework encompasses five key components of program evaluation: reach of the program to its intended population (including participation rate); efficacy or

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effectiveness of the program in achieving its goals; adoption of the program by implementing staff; implementation consistency, costs, and adaptations of the program; and maintenance of the program over time. An evaluation guided by RE-AIM considers not only program efficacy but also translatability, impact, and sustainability (Glasgow et al., 1999; RE-AIM.org, 2015). Interview questions were also informed by results of an e-mail survey about HOP implementation conducted by the Department of Health and Mental Hygiene with 735 school nurses in March 2013. Survey responses were reviewed to ensure that interview questions addressed all issues that school nurses perceived as influencing HOP implementation. Table 1 includes the interview questions. Of note, some interview questions were not relevant to nurses with no HOP experience (e.g., “How do students react to HOP?”) and were therefore not asked of these nurses. Interview recordings were transcribed by a professional transcriptionist. Transcripts were uploaded to NVivo (QSR International, n.d.) for data analysis.

Data Analysis

Data were analyzed using content analysis (Holsti, 1969; Krippendorf, 2003; Neuendorf, 2002); the interview transcript was the unit of analysis. Data analysis was an iterative process; it began following completion of the first interview and continued as subsequent participants were recruited and interviewed. After multiple readings of each transcript and guided by the RE-AIM framework (Glasgow et al., 1999; RE-AIM.org, 2015), the researchers marked ideas, terms, and phrases of meaning to develop codes. Codes were iteratively grouped to identify categories and link them to themes. The researchers met weekly to discuss findings and illustrative examples from transcript text. Discrepancies were resolved through consensus. These meetings facilitated analyst triangulation. Analyst triangulation is a method for reducing bias in qualitative research; multiple researchers discuss study data in order to decrease the risk of one researcher’s perception being overly represented (Patton, 1999). An audit trail was maintained to enhance dependability by allowing for external examination of the research process and product (Golafshani, 2003), with each step of the analysis process documented in NVivo and Microsoft Excel. Data saturation was achieved when interviews became redundant, when comprehensive themes encompassed all data, and when further theme development was no longer possible (Fusch & Ness, 2015; Guest, Bunce, & Johnson, 2006).

A heat map, a visual way to further examine coded text, summarize findings, and foster insight into study results that may not be possible using standard textual analysis (Evergreen, 2016), was created using Microsoft Excel following consensus about theme identification. Using NVivo, all coded texts were queried by theme. Each statement within a theme was coded by one researcher (K.S.) as positive, negative, or neutral. For example, “The school principal really made it easier for me to implement HOP in my school” or “The school principal was worried about HOP at first, but after I spoke with her, she was very supportive” would both be coded as positive. “The school principal made it very difficult to enroll students in HOP” would be coded as negative and “The school principal was not really involved in HOP” would be coded as neutral. Each participant’s experience within a theme was then summarized as “facilitator or easily managed barrier” (mostly positive statements), “barrier” (mostly negative statements), or “neutral or mixed” (mostly neutral

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statements or equal number of positive and negative statements). The completed heat map was inspected to examine response patterns by level of HOP experience and as a whole to assure that selected quotations accurately reflected all nurses' experiences.

Member checking was conducted with two nurses (one with intermediate experience and one with no HOP experience) who had participated in the study to ensure that findings reflected nurses' perceptions. Both nurses were provided with a final draft of the manuscript via e-mail and asked to consider whether the themes and exemplar quotations accurately captured their experiences with HOP and whether any important barriers or facilitators were overlooked. They then met with one researcher (K.S.) via phone to discuss their perspective regarding the results.

Results

During recruitment, 31 nurses were contacted; of these, 19 agreed to participate (4 with extensive HOP experience, 8 with intermediate HOP experience, and 7 with no HOP experience in the current school year). Reasons for nonparticipation included failure to respond to recruitment e-mail/phone call ($n = 11$) or family commitments limiting time available for participation ($n = 1$). An overview of sample characteristics is presented in Table 2. All participants with no HOP experience were familiar with the program and all except one had presented lessons based on the HOP curriculum (nutrition and physical activity education) at the classroom level. Participants with intermediate and extensive experience had, on average, 5 years of experience implementing HOP; during the current school year, they had implemented HOP, on average, with 3 and 11 students, respectively. Eight themes emerged from the data. Each theme, organized by the RE-AIM framework (Glasgow et al., 1999; RE-AIM.org, 2015), is presented below.

Reach

Gatekeepers.—Parents and school administrators influenced nurses' ability to implement HOP with students who the nurses felt may benefit from the program. Some parents were insulted or angered after receiving the letter explaining their child's eligibility and did not allow their child to participate. Others did not opt out at first but expressed anger after the nurse began to work with their child and asked for their child to be withdrawn from the program.

> I can't even begin to tell you the phone calls that I received … It was basically how dare I intrude … "We're big-boned people." "I have a pediatrician that deals with my child's health." "I understand that you're there for an emergency or to give out medications, but I do not want you to speak to my child again about nutrition." (Participant 12, Intermediate HOP Experience)

School principals sometimes pressured nurses to not implement HOP to avoid the actual or perceived risk of upsetting parents.

> The reason that I am not doing the HOP program here is because of the principal. Every year she says she wants to opt out of the program… because the parents were feeling offended by the opt out letter that was mentioning "obesity" … They were

> calling the principal and complaining about the nurse giving them those letters. (Participant 6, No HOP Experience)

> The principal doesn't want one-on-one [HOP sessions] because she doesn't want the parents to get insulted. (Participant 7, No HOP Experience)

In contrast, one nurse with extensive HOP experience noted that her principal advocated for her enrollment of children in HOP.

> We have a new principal, she's fantastic. She told me whatever you want to do, go for it. We'll support you. So it's not an issue at all with school. (Participant 14, Extensive HOP Experience)

Another nurse noted that sometimes the principal was supportive of a child's enrollment in HOP but the child's parent would not allow the child to participate.

> Yes. I mean, [the principal] is very supportive of HOP … [but] she has to respect what [the parents] really want. (Participant 18, Extensive HOP Experience)

It takes a team.—Nurses described the importance of cooperation with parent and school personnel when implementing HOP. Particularly for nurses with extensive HOP experience, teachers supported students' participation in the program.

> And [the teachers] are very receptive … That helps a lot. I don't have any of the teachers saying "Oh, you can't take them out of class." And if I ask them to do anything for me, they would do it. (Participant 16, Extensive HOP Experience)

Some principals also helped nurses to overcome obstacles to implementing HOP.

> If I'm getting so behind seeing the kids … I would ask my principal if she can send an e-mail to the teachers, like for the first two periods not to send anybody to the medical room … And right away, she responds. She sends an e-mail. (Participant 4, Extensive HOP Experience)

While less common, some parents encouraged the nurses' implementation of HOP.

> One parent was like, "Yes. Anything you can do. Please, your suggestion. I'm trying to get on him, or whatever you can do." (Participant 8, Intermediate HOP Experience)

For some nurses, parents' support for HOP varied.

> I would say maybe about 30% [of the parents] … were angry. You know, 30% were receptive and the other 40% really didn't care either way. They just did nothing. (Participant 1, Intermediate HOP Experience)

Effectiveness

An uphill battle.—Many nurses expressed that helping a child to reach a healthy body weight was an uphill battle and described contextual factors as barriers to HOP's potential effectiveness. One factor commonly cited was the home food environment.

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> Every parent that I talk to said "Oh, this is so great. Maybe you can help me get them thinner." It kills me, because they're the ones giving them the food. They're young kids, they can't go out and buy it themselves. (Participant 14, Extensive HOP Experience)

Nurses also described the school and community environments as promoting unhealthy choices.

> And there are too many fast-food chains in the neighborhood where my school is … So if I can get … fries and soda and chicken nuggets for $1.99, why would I cook? (Participant 4, Extensive HOP Experience)

Sometimes nurses felt that community resources existed, but that parents were too busy to use them.

> A big park nearby has a track and anything and everything … but you would have get yourself there. Again, the motivation to do that when parents come home makes it difficult. (Participant 19, Intermediate HOP Experience)

Adoption

Stigma.—Some nurses were hesitant to adopt HOP because they thought HOP participation would stigmatize children. In some cases, nurses who were concerned about stigma acted as gatekeepers and limited a child's participation with the hope of protecting that child from being ostracized. Multiple nurses suggested presentation of obesity education at the classroom level as a way to provide obesity education without singling out children with obesity. Nurses who implemented HOP took special measures to be sensitive to participants' self-esteem.

> It's bad enough being a heavyweight child let alone being embarrassed in front of the class. "Oh my god, she have to go and get a lesson from the nurse because she's fat." (Participant 2, No HOP Experience)

> I would always be very sensitive to that because they don't want to be called out of class … I can get [the student] quietly in the hall and say, "Hey, I just want to talk to you if you get a break today," and he would say, "Okay," and he would come back maybe after lunch or something like that. (Participant 8, Intermediate HOP Experience)

While nurses frequently described concern about potential stigmatization, not all perceived that students felt singled out by program participation. Some mentioned that older students were sensitive about their weight, but others noted that many younger students enjoyed participating in HOP and demonstrated no embarrassment about attending HOP sessions.

> I don't think that there was really any negative effects mentally for them. I don't think they were upset over it. (Participant 1, Intermediate experience)

> I mean, they love coming to my office … I don't think they thought of it as, "Oh, there's something wrong with me." (Participant 11, No HOP Experience; speaking about her experience implementing HOP in a prior school)

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Fitting HOP into a heavy workload.—Many nurses cited workload as their biggest barrier to implementing HOP. They described being busy with walk-in visits, medication administration, and documenting nursing care. Nurses who worked in schools with fewer students noted that their lighter workload made it easier for them to implement HOP.

> I'm so busy that I feel guilty. I want to spend more time with this kid, but I just can't. I just don't have the time to spend more time with these children. (Participant 4, Extensive HOP Experience)

> Have you ever walked into a public school into the medical room? … It's very busy … Yes, nurses can do a lot, but unfortunately they cannot educate a thousand children about nutrition, and that's a fact. (Participant 6, No HOP Experience)

Nurses who implemented HOP reported making special efforts to fit HOP into their busy schedule. For example, one nurse met with a student after school before his school bus arrived. Others made efforts to collaborate with other school administrators and staff to gain support for HOP implementation during the school day.

> I would say not my time [is a barrier], because once I decide to take a child on, I make the time. (Participant 9, Intermediate HOP Experience)

> I even spoke at a PTA [Parent Teacher Association] meeting at the beginning of each school year and kind of talked a little bit about HOP … I brought this up to the administration, the dean, the [teachers ' union] leader … just kind of letting them know about the program and that this is what we are trying to do as school nurses. (Participant 12, Intermediate HOP Experience)

Implementation

Creativity and tailoring.—While there is a protocol for HOP that guides session content and frequency, nurses have autonomy to tailor the program. Many nurses adapted the program to meet the constraints of their school. For example, one nurse with a high nurse-to-student ratio met with students in groups of three instead of individually to increase the number of students who could participate. Another facilitated parent participation by having a HOP session after the child and parent met with the guidance counselor.

> The [guidance counselors] have meetings with a lot of the students that I have in HOP. When they have a meeting with the parent I'll ask them if they could just stop by and sit a few minutes with me. That's worked out. (Participant 19, Intermediate HOP Experience)

Many of the nurses described using creative methods to teach students about nutrition, such as making healthy snacks in the classroom. Although some nurses were unable to implement HOP, they made efforts to ensure that children received physical activity or nutrition education in other settings (such as during walk-in visits).

> Let's say an overweight child walks to the nurse's office, so we provide health education without the student realizing, "Okay, they are talking to me this way because I am obese" … We can say in the conversation, "What did you eat for

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> breakfast today?" if they come with a stomachache. And that makes them discuss healthy products. (Participant 6, No HOP Experience)

Economic and cultural considerations.—Nurses recognized that a child's cultural or socioeconomic background impacted his or her nutritional intake, physical activity habits, and HOP efficacy. They attempted to adapt HOP to the unique needs of their student population.

> Since I was in a Hispanic community, I … went ahead and got [nutrition education] that was more useful for them … It's mostly a Hispanic community, so what happens is the children eat a lot of rice and beans. And I think that it's cheaper for the parents also. (Participant 1, Intermediate HOP Experience)

> And I tell [the parents] that any city hospital has a green market that has fresh fruits and vegetables and that they can use food stamps [to pay for it]. (Participant 14, Extensive HOP Experience

Occasionally, though less often, economic status was mentioned as a facilitator to HOP implementation.

> He was also trying to go to the gym. So that was another good thing that he had the resources that he was able to do that … I always want to say that the economic background of these children was a little bit more affluent, so they also had the ability to at least have these things available to them. (Participant 8, Intermediate HOP Experience)

Maintenance

None of the participating nurses seemed to be in the maintenance phase of HOP implementation. However, most nurses described ways to tailor HOP to make it more sustainable and feasible.

Improving HOP for the future.—Recommendations for expanding HOP implementation and improving program sustainability fell into three categories: provide more support to busy nurses, increase parent involvement, and implement HOP at the classroom level instead of the individual level. Nurses noted the need for additional staff, such as public health aides or additional nurses, to decrease their workload, so that they could devote more time to HOP implementation. One nurse described working with local nursing students who helped her to implement HOP at the classroom level; she found that to be successful and feasible. Nurses also had various ideas for increasing parent involvement, though they realized doing so would be a challenge based on some parents' resistance to the program and parents' busy schedules. In addition, nurses who presented nutrition and physical activity education at the classroom level noted that parents, teachers, and administrators were more receptive to classroom education than individual obesity counseling.

Heat Map

Figure 1 presents the collective findings by theme and level of HOP experience illustrated as a heat map. Nurses with extensive HOP experience perceived principals and parents

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(Gatekeepers) and teamwork with parents and school colleagues (It Takes a Team) as either facilitators or neutral to HOP implementation. Busyness (Fitting HOP into a Heavy Workload) was perceived as a barrier to nurses with all levels of HOP experience, though it was most widely reported as a barrier to nurses with no HOP experience. The effects of a heavy workload for extensive experience nurses may have been counteracted by the facilitator of teamwork (It Takes a Team). The widespread facilitator of Creativity and Tailoring suggests that all nurses were able to work creatively to either make HOP implementation more feasible within their school or to help students receive obesity education in ways external to HOP. Almost all nurses with no HOP experience perceived Gatekeepers and Stigma as barriers, whereas almost all nurses with extensive HOP experience perceived Gatekeepers and Stigma as either a facilitator or neutral. This may suggest that Gatekeepers and Stigma play a key role in influencing HOP implementation. In addition, the consistency of teamwork as a facilitator for nurses with extensive experience suggests that partnership with school staff and parents is integral to implementing HOP with a large number of children. It is also possible that nurses with extensive HOP experience have higher self-efficacy with childhood obesity interventions (Quelly, 2014); they may be more adept at overcoming barriers and optimizing facilitators to HOP implementation.

Discussion

This study examined nurses' perceptions of facilitators of and barriers to implementing a school nurse-led intervention for children with severe obesity. Findings demonstrated that parents, school administrators, and concerns about stigma sometimes hindered HOP implementation, whereas teamwork with school staff and parents facilitated HOP implementation. Nursing workload was the most consistent barrier to program implementation. Nurses noted the effect of economic status, culture, and school and community environments on HOP and they often tailored HOP to their school environment or students' needs. Lastly, nurses felt that in order to make HOP more sustainable, increased parental involvement and minimized nursing workload were required.

The majority of findings of this study are concordant with the existing literature that examines school nurses' role in children's weight management (Kubik, Story, & Davey, 2007; Stalter, 2010,2011). As with previous research, nurses found workload, parental involvement, and concerns about stigma limited program implementation (Stalter, Chaudry, & Polivka, 2011; Steele et al., 2011). In addition, they found support of school partners to be helpful (Kubik et al., 2007). In contrast to previous work, lack of knowledge about obesity did not emerge as barriers to program implementation (Steele et al., 2011). This may be because the full-day training received prior to program initiation provided adequate preparation; it remains unclear whether educational refreshers would benefit program implementation.

Nurses with extensive HOP experience did not think that participants felt stigmatized by being in the program, despite concerns about stigmatization from nurses, parents, and principals. Prior research has identified risks of bullying, social isolation, and stigmatization for children with obesity (Griffiths, Wolke, Page, & Horwood, 2006; Janssen, Craig, Boyce, & Pickett, 2004; Puhl & King, 2013). This is particularly true for older and female children

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(Griffiths et al., 2006). Nurses took special efforts to ensure that students did not feel embarrassed by participating in HOP. While some nurses noted that weight was a sensitive issue for the students, none found that students did not want to participate in HOP for this reason. In fact, some nurses described that young students enjoyed participating in HOP, suggesting that they either felt no stigma due to their weight or that HOP participation did not increase this stigma. Future work should examine the perceptions of children participating in obesity programs, particularly programs that are targeted to individual children who are overweight or obese.

One barrier that nurses may be able to address is principal resistance. Some nurses noted that principal opposition made HOP implementation more difficult or, in some cases, completely prohibited implementation. The principals' concern arose from the risk of upsetting parents; and as demonstrated, some parents did become upset. Parents felt insulted that their child was affected by obesity or feared that their child would be stigmatizing by program participation. Nurses can take action to address principals' apprehension by ensuring that principals are closely informed about an obesity intervention prior to implementation. Specifically, principals may be interested in efforts to avoid stigmatization (i.e., a positive focus on healthy goal setting, maintenance of privacy during obesity counseling sessions). In addition, nurses can have conversations with school principals regarding how parent consent will be obtained for programs such as HOP and how parent concerns will be addressed. By meeting with the principal early in the intervention planning phase, a nurse and principal partnership for implementing school nurse-led obesity interventions may be formed.

School nurses can also help address parent resistance. For example, nurses can advocate for more sensitive ways to notify parents regarding their child's weight status. Informing parents via letter may cause confusion or raise concern about impacting a child's self-esteem (Moyer, Carbone, Anliker, & Goff, 2014), particularly for certain subgroups such as parents from Hispanic cultures (Keough, 2015). It may be preferable for the nurse to contact parents by phone or in person about their child's eligibility for an obesity intervention; communication must be done in a sensitive and culturally appropriate manner that avoids blame and shame.

An unexpected study finding was nurses' preference for general classroom obesity education compared to one-on-one HOP sessions. Some nurses had already incorporated HOP curriculum into classroom education and found it to be enjoyed by students and acceptable to parents, teachers, and administrators. Other nurses had not yet implemented classroom sessions but suggested that it may be a way to avoid current barriers to HOP. While general classroom education would avoid concerns about stigmatizing students with obesity, it would not alleviate barriers related to nurses' workload because nurses would still have to teach the classroom sessions. In addition, classroom sessions would not allow for parent involvement, which is key to obesity intervention effectiveness (Katz, O'Connell, Njike, Yeh, & Nawaz, 2008; Safron, Cislak, Gaspar, & Luszczynska, 2011; Sobol-Goldberg, Rabinowitz, & Gross, 2013). However, classroom sessions could include other components that predict school-based intervention effectiveness, such as greater than 1 year duration,

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comprehensive content (Bagby & Adams, 2007), and a focus on reducing sedentary behavior or increasing physical activity (Safron et al., 2011).

Classroom sessions may be a good alternative or complement to individualized obesity interventions, particularly because obesity education about nutritious eating and physical activity could benefit all students rather than limiting this education to students who are obese. However, it is important to note that classroom sessions and individual obesity counseling serve different purposes because they focus on different populations. Individual obesity counseling programs, such as HOP, target children with obesity and therefore are an obesity treatment modality; classroom sessions target all students and therefore serve as a general obesity prevention modality. This may not be a key consideration for HOP because of its low implementation rate but would merit consideration in the early stages of developing future school nurse–led obesity interventions.

HOP's focus on severe obesity is unique among school-based obesity interventions; it is important to note that management of severe obesity requires more intensive treatment than is possible in the school setting. Lifestyle interventions alone are often ineffective (Danielsson, Kowalski, Ekblom, & Marcus, 2012; Johnston et al., 2011). Treatment modalities for severe childhood obesity may include intensive family-based treatment (sometimes as an inpatient; Luca et al., 2015; Taylor, Peterson, Garland, & Hastings, 2016; van der Baan-Slootweg et al., 2014), bariatric surgery (for teenage children; Nobili et al., 2015; Schmitt et al., 2016; Thakkar & Michalsky, 2015), medication (Boland, Harris, & Harris, 2015), and/or long-term treatment using a chronic care model (Rijks et al., 2015).While one-on-one obesity counseling with the school nurse allows for individualized interaction, it is unlikely to have meaningful health effects for children with severe obesity because of its limited scope and intensity. However, children with severe obesity may need assistance managing comorbidities and adhering to their obesity treatment plan during the school day and school nurses are ideally suited to help them do this. School nurse–led obesity interventions may be best suited for general obesity prevention education, such as classroom sessions for all children, or for overweight children who may benefit from less intensive counseling interventions.

Recommendations for School Nursing

Our study has multiple practical implications for school nurses. While nurses may be well suited to implement obesity programs (Kubik et al., 2007; Morrison-Sandberg et al., 2011; Pbert et al., 2013; Tucker & Lanningham-Foster, 2015), they face barriers in their ability to do so. Many nurses identified a heavy workload to be a barrier to HOP implementation. When planning for the implementation of a school nurse–led obesity program, current nursing workload must be carefully considered. Do the nurses have time to implement such a program? Is the school administration supportive of the program? Factors that might support nurses' ability to implement programs such as HOP include support staff such as a public health aide/nursing aide who can receive walk-in visits and screen for emergencies during intervention sessions. Other factors such as maintaining staffing to meet a nurse-to-student workload of one nurse per 750 students (National Association of School Nurses, 2015) could also allow time to implement obesity interventions. Due to the amount of

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responsibilities held by many school nurses, it is unlikely that they can independently implement intensive obesity programs; such programs would require partnership with school partners such as teachers. An interdisciplinary program may be best coordinated in school in which there is an established wellness committee. General classroom education for all students could be one component of such a program in addition to one-on-one counseling for students with obesity. Any program targeted to children with severe obesity should incorporate partnerships with a child's primary care provider for the intensive clinical management required for this condition (Kelly et al., 2013).

Parents sometimes did not allow their child to participate in HOP, though increased parent involvement was seen as key to HOP refinement. To foster parent support for a school nurse–led obesity program, the program could be explained to parents prior to implementation at parent teacher association meetings. Parents could be notified about their child's eligibility using sensitive, respectful, and culturally competent communication. It would be important to stress that the program focuses on promoting health, not blaming a child or parent for obesity.

Before implementing a school nurse-led obesity intervention, school nurses must receive adequate training. Resources such as intervention materials, referral to external resources, and in-service education on obesity etiology and treatment may be needed. Training in delivery methods for health behavior interventions, such as motivational interviewing, should also be considered (Miller & Rollnick, 2004; Rollnick & Miller, 1995). Training should be tailored to the baseline knowledge of the school nurses, which may vary between nurses and school districts.

Recommendations for Future Research

Additional research is needed to guide the development of feasible and efficacious school nurse–led obesity interventions. First, a better understanding of nurses' role in school-based obesity programs must be qualitatively explored with parents, teachers, principals, and children; this may be helpful in addressing program barriers. Second, evaluation of future school nurse–led obesity interventions must address intervention feasibility and implementation—not solely impact on body measures. After efficacy of a school nurse–led school-based obesity intervention has been established, evaluation must continue into the maintenance phase when attention devoted to the intervention may diminish and competing responsibilities may arise.

Strengths and Limitations

Our study has strengths and limitations. Strengths include being one of the first to examine nurses' experiences with a school nurse-led obesity intervention. Further strengths include our ability to interview nurses in 19 diverse schools that vary in regard to students' socioeconomic statuses, neighborhood characteristics, racial/ethnic and cultural backgrounds, and grade distribution. The nurses included in our study represented a broad array of school nursing experiences. In addition, even though only children with severe obesity were eligible for HOP, our findings are likely generalizable to school nurse–led interventions for overweight or non-severe obesity because the identified facilitators or

barriers were not directly related to obesity level. Study limitations include the restriction of our sample to school nurses; we did not interview principals, parents, or students. Also, our results may not be generalizable to obesity interventions delivered in rural schools or nonschool settings. Some findings, such as those related to workload barriers, are likely not generalizable to interventions led by school personnel who have different roles and responsibilities than school nurses. In addition, only 19 of the approximately 1,000 nurses who work in New York City schools were interviewed; while we did reach data saturation, it is possible that including additional nurses to our sample may had provided different findings. Lastly, we made an a priori decision to choose RE-AIM, a theoretical framework that focuses on intervention implementation, for developing interview questions. Because HOP implementation was rare (5% of target population), some aspects of RE-AIM may not have been relevant to all participants, particularly those nurses lacking HOP experience.

Conclusions

Findings of this study suggest that school nurses faced challenges in implementing this obesity intervention. Despite experiencing barriers, many of the nurses used creativity to adapt the program to the needs of their school. With awareness of potential barriers and facilitators, feasible school nurse–led obesity interventions can be developed, implemented, and evaluated with the aim of reducing childhood obesity and supporting student health.

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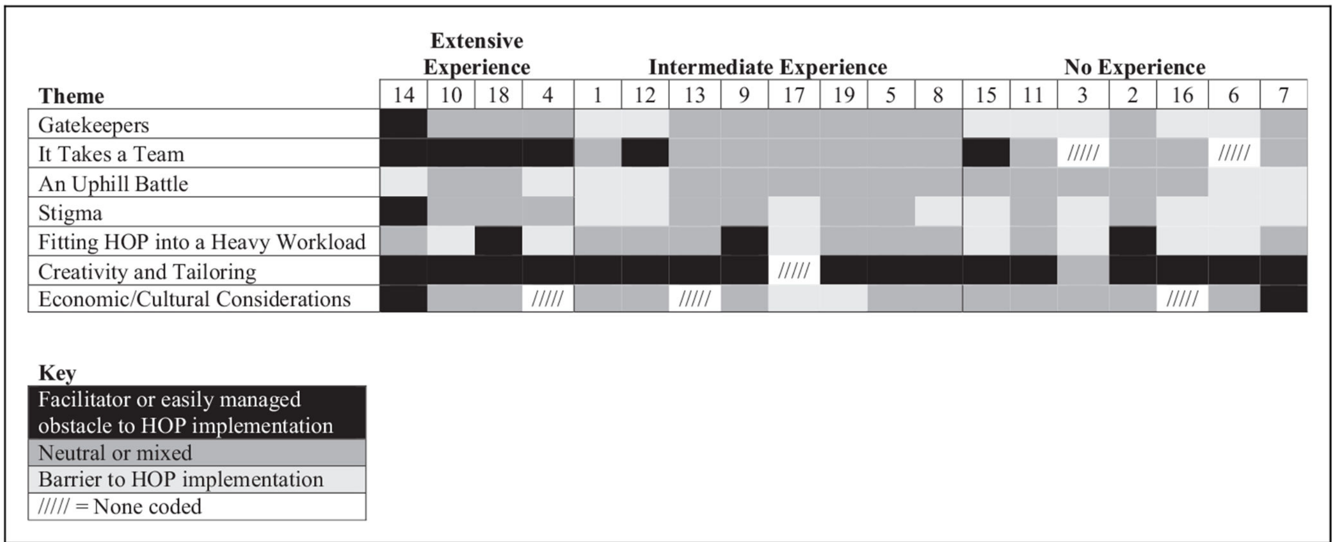

Figure 1.
Heat map of participants' perceptions of barriers to and facilitators of HOP implementation by Healthy Options and Physical Activity Program experience level.

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Table 1.

Interview Guide Used in Semi-Structured Interviews With Study Participants.

Question
Reach
How do you select students for HOP implementation?
Can you please tell me about the children who could benefit from HOP but do not receive it? What barriers do you face to enrolling children in HOP?
Effectiveness
What aspects of HOP can help students decrease BMI or change health behavior?
What aspects, if any, would need to change to allow HOP to work better?
What negative effects, if any, does HOP have on children? (prompt: Do you think children that are selected for HOP might be subject to additional bullying or teasing because they are in HOP?)
What unexpected effects (positive or negative) does HOP have on children who participated?
Adoption
What kinds of things make it easier for you to implement HOP?
What kinds of things make it harder for you to implement HOP?
What is your experience with the principal and administrators, when it comes to HOP?
What about with parents?
How do students react to HOP? Describe a typical interaction with a student during a HOP session.
Implementation
How good is your understanding of how HOP is supposed to be implemented? How helpful (or unhelpful) are the HOP resources to you?
How helpful (or unhelpful) is the electronic medical record to your implementation of HOP?
Consider your knowledge about childhood obesity. What else, if anything, would you want to learn in order to feel better prepared to implement HOP?
What helps you to implement HOP as you see fit? Or, what changes would need to be made to allow you to implement HOP as you see fit?
Maintenance
What are your suggestions for implementing HOP in the future?
What would make it easier for you to implement HOP with more children?

Note. BMI = body mass index; HOP = The Healthy Options and Physical Activity Program.

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Table 2.

Participant Characteristics.

Characteristic	*n* (%)
Female gender	19 (100)
Age	
25–44	3 (16%)
45–64	14 (74%)
>65	2 (10%)
Race	
White	12 (63%)
Black or African American	2 (11%)
Asian	5 (26%)
Ethnicity	
Hispanic or Latino	3 (16%)
Non-Hispanic or Latino	16 (84%)
Total years worked as a school nurse	
3–5	2 (11%)
6–10	3 (16%)
11–15	5 (26%)
>15	9 (47%)
Highest degree attained in nursing	
Associates	5 (26%)
Bachelors	13 (68%)
Master’s	1 (5%)
School wellness committee	
Yes	3 (16%)
No	16 (84%)
Approximate number of students under nurse’s care	
0–250	3 (16%)
251–500	2 (11%)
501–750	4 (21%)
751–1,000	9 (47%)
1,001–1,250	1 (5%)