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RESEARCH ARTICLE

Evaluation of Obesity Prevention in a Head Start Program

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An evaluation of the *I am Moving, I am Learning* strategies was conducted in one Head Start program. A mixed methods design was used, including caregiver and teacher surveys, and nutrition specialist classroom observations. 249 caregivers and 46 teachers participated. Teachers identified their influence on preschoolers through role modeling of healthy eating and physical activity and were observed using the program mascot and music. However, they did not model physical activities and engaged in limited nutrition discussions during meal/snack times. Teachers identified the need for more time to incorporate IMIL activities, additional resources for implementation, more caregiver engagement with IMIL, and take-home activities/music. Most caregivers were not familiar with IMIL/5210 messages and did not incorporate health behaviors at home. Future research could explore the impact of caregiver engagement in IMIL on child/family behavior change and strategies for enhancing teacher modeling of movement in the classroom.

Keywords: Obesity prevention, early childhood education, program evaluation, Head Start, overweight

INTRODUCTION

In 2018, 16.6% of children served by the Head Start program had obesity, making it a significant health concern (Imoisili et al., 2020). The national prevalence of obesity among low-income children is disproportionately higher than children in a nationally representative sample NHANES (CDC,2020). Early care and education programs have been called upon to address childhood obesity and facilitate prevention interventions, especially among at-risk populations (Centers for Disease Control and Prevention, 2021)). The Office of Head Start (HS) has reinforced the need for the development and implementation of obesity prevention efforts beginning in a child's formative, preschool years. As an early education program serving more than a million racially and ethnically diverse low-income families across the US each year, HS is an ideal setting for prevention programming (US Department of Health and Human Services, 2019). *I Am Moving I*

Am Learning (IMIL) was designed as one proactive approach to address childhood obesity in HS through direct education and policy, systems, and environmental (PSE) changes (Finkelstein et al., 2007).

IMIL is a set of enhanced, active learning strategies embedded within the existing school readiness curriculum, designed to be an integrated approach to addressing childhood obesity among low-income preschool age children (Finkelstein et al., 2007). The main goals of IMIL are to increase the quantity of time spent in moderate to vigorous physical activity (MVPA) during a child's daily routine (unstructured play), improve the quality of structured movement experiences intentionally facilitated by teachers and caregivers, and improve healthy food and beverage choices for children every day (Finkelstein et al., 2007). The HS program has also integrated nutrition messaging from a program known as 5-2-1-0, that shares similar goals to IMIL. The name 5-2-1-0 refers to consuming five or more daily servings of fruits and vegetables, limiting screen time to two hours per day, engaging in one or more hours of daily physical activity, and consuming zero sugary drinks (Rogers & Motyka, 2009). The incorporation of IMIL and 5-2-1-0 align with existing goals of HS programming to provide sufficient time, space, equipment, materials, and adult guidance to promote active play that supports the development of gross and fine motor skills (US Department of Health and Human Services, nd). IMIL supports initiatives like 5-2-1-0, and as such the HS programs often use the 5-2-1-0 messaging to educate families on both physical activity and nutrition as an extension of IMIL in the classroom. HS also requires that meals provide at least one-third of a child's daily nutritional needs, that staff and children eat together family style, and that programs adhere to serving sizes and minimum standards for nutrient content and menu planning required by the U.S. Department of Agriculture's National School Lunch and School Breakfast Program (Finkelstein et al., 2007).

Ensuring high-quality implementation of obesity prevention programs is important to highlight program improvements that will assure program effectiveness (Moreell-Samuels et al., 2018). Other components of implementation that have been identified as critical are staff training and participant engagement (Spoth et al., 2013). However, limited implementation evaluation of IMIL has been reported. HS in Region 3 (West Virginia, Virginia) conducted an evaluation, but primarily focused on the perceptions of teachers and other program implementers within HS (Fox et al., 2010). Another study highlighted the successful implementation of IMIL through an academic-community partnership and teacher training, but the focus was on the role of partnership for successful implementation (Zahnd et al.,2017) No other evaluations of IMIL implementation have been reported.

The purpose of this research was to conduct an evaluation to examine the implementation of IMIL in one HS program. The Framework for Evaluation in Public Health from the Centers for Disease Control and Prevention was used to guide this evaluation research (CDC, 2017). Figure 1 outlines the logic model that was designed in conjunction with a HS advisory committee and utilized for this IMIL evaluation project.

The specific research questions guiding this study were a) to what extent are HS teachers utilizing materials, role-modeling physical activity, and providing nutrition messages? b) what are the barriers and facilitators identified by teachers during the program implementation of IMIL? and c) to what extent are IMIL and 5-2-1-0 implemented in the home environment?

METHODS

This cross-sectional study utilized teacher and caregiver surveys, as well as classroom observations, to conduct an evaluation post-implementation of the IMIL program. The timeline for post-implementation evaluation occurred 6 months following the initial training , and was predetermined in order to provide HS evaluation data within the academic year. The institutional Review Board at the authors institution approved the research study.

Participants

Participants included teachers and caregivers of preschool students across all 13 sites (25 classrooms) in one HS program in the Midwest. Two HS Nutrition Specialists were recruited to assist with the research study due to their familiarity with the teachers and their role in nutrition monitoring in the classrooms. Teachers and caregivers were recruited via email and flyers sent home through children's backpacks. The survey was sent along with recruitment materials. The informed consent was the cover page of the email and flyer sent to potential participants. Researcher contact information was provided for teachers and caregivers in the event of questions or concerns regarding the survey.

Program Implementation and Training

One HS program in the Midwest adopted the IMIL program as an enhancement to their standard classroom curriculum. Training was scheduled for November and the IMIL enhancements were incorporated into the Spring curriculum (January-May). IMIL was intentionally incorporated during circle time, activity centers, mealtime, and in 5-2-1-0 messages communicated to caregivers through handouts in children's backpacks. The existing curriculum in each classroom was updated with weekly IMIL activities to be utilized.

HS faculty and staff were required to attend a one-day training organized by the HS program and delivered by IMIL trainers. Training included strategies for intentionally incorporating physical activity into classroom learning; improving food choices in the classroom and at home; and developing action steps to implementing the program in the classroom to reduce childhood obesity rates and simultaneously meet HS standards. At the training, attendees also received necessary materials to implement the IMIL program. These included music and movement CDs, weekly lesson plans, and 'Choosy dolls'. Choosy is an influential superhero who promotes and defends healthy habits through songs like My Heart Says Thank You, My Teeth Need Brushed, The Sugar Monster, Boss of My Body, Stir the Soup, and Let's Make a Salad. Choosy serves as a mascot of IMIL and helps reinforce healthy choices for children. The music contains lyrics which guide the children through different movements while providing health/nutrition education. Classroom teachers were expected to lead the movements through visual cues (doing the movements) and encouraging the children to follow and sing along. For example, a popular song that is often incorporated during circle time is *My Heart Says Thank You.* The song lyrics say, "when I (eat my veggies, run, jump, move) my heart says thanks you". Teachers could use the Choosy doll to have

children move with or play the song via a YouTube video as a visual cue. During mealtimes at school, teachers were expected to sit at the table and eat with the children, as well as talk about healthy food choices, using Choosy as a role model. Choosy could also be incorporated into large motor movements during unstructured play time (Choosy rides on a big wheel, plays on the swings, goes down the slide). Caregivers were encouraged to implement the nutrition and physical activity information at home through weekly 5-2-1-0 nutrition messages and Choosy activities, such as coloring activities and examples of indoor physical activity. Children were also able to take Choosy home over a weekend as a reminder of healthy habits at home. Posters were available to be posted in the classrooms and around the hallways of the school as visual reminders for caregivers, children, and teachers to make healthy choices.

Instruments

Following the Train-the-Trainer event, HS staff co-developed the evaluation measures (caregiver surveys, teacher surveys, and nutrition specialist classroom observations) with the project researchers through examination of evaluation questions utilized in previous process evaluation research. The survey instruments were pre-tested with the county HS Advisory Board, composed of current and former HS caregivers, teachers and staff and then revised based on their feedback.

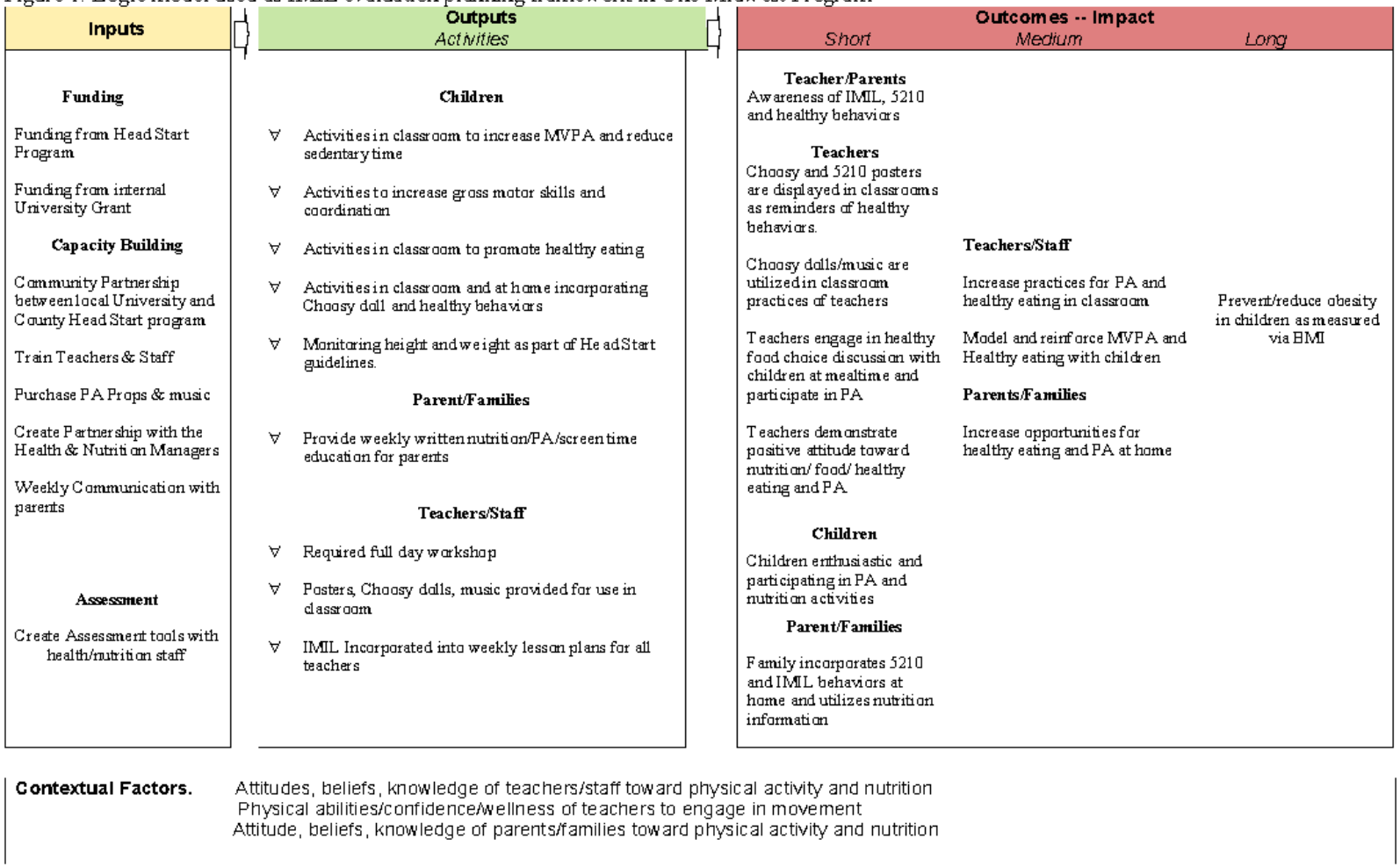
Teacher Survey

The 20-item teacher survey consisted of open-ended, demographic and 4-point Likert Scale questions (outlined in Table 2) focusing on implementation of the IMIL/ 5-2-1-0 programs in the classroom. Survey questions focused on teacher perception of the IMIL program, barriers and facilitators to program implementation, perceived student behavior changes as a result of program implementation, and perceived personal behavior change as a result of utilizing the program in the classroom. All teachers completed the IMIL training prior to program implementation (as required by the HS program), and were subsequently invited to complete the survey. Teacher surveys were sent out electronically to teachers' HS email and on paper through HS internal office mail. Participation in survey completion was voluntary and anonymous. Teachers were incentivized with a $10 gift card for completion of the survey, as well as assisting with weekly written caregiver survey completion reminders, which were placed in all parent communication folders.

Caregiver Survey

The 10-item caregiver survey was designed to assess caregiver familiarity, receptiveness, and readability of IMIL health messaging, including the 5-2-1-0 healthy eating, active living message. Question responses used a 4-point Likert scale (Table 2). Surveys and consent forms (available in both English and Spanish) were sent home with each enrolled child at the end of a pre-designated school day. Caregivers in each classroom who returned the survey were entered in a drawing for a $10 gift card.

Figure 1. Logic model used as IMIL evaluation planning framework in One Midwest Program



Nutrition Specialist Observation Checklist

Structured observations were conducted using a nine-item checklist to evaluate the implementation practices of the IMIL program, observe teacher and student engagement in IMIL activities, examine classroom use of 5-2-1-0 (or other nutrition) messaging, and evaluate teacher interaction with students during meal/snack times related to nutrition and healthy eating discussions. The HS program's two Nutrition Specialists were trained to use the checklist and mock observations in 3 classrooms were conducted to determine inter-rater reliability, which was 100%. Teaching staff did not receive notification prior to classroom observations. Nutrition Specialists received a $25 gift card to assist with the development and completion of the checklist, as well as all classroom observations.

Data Analysis

Descriptive statistics were utilized for highlighting survey data from caregivers and teachers using SPSS (IBM, 2017). Open-ended questions were analyzed using a phenomenological approach. Significant statements from the qualitative data were coded by two researchers trained in qualitative methods. Themes were generated from the analysis of the significant statements (Creswell & Poth, 2016).

RESULTS

Across the 13 preschool sites (25 classrooms) in the HS program, 249 caregivers and 46 teachers participated in the research study. Table 1 provides caregiver and teacher descriptive statistics. The 249 caregiver respondents represented a 57% response rate, whereas 100% of the teachers completed the survey.

Teachers

Table 2 summarizes the teacher survey results. The majority of teachers either agreed or strongly agreed that they have an important influence on both the physical activity and food preferences of preschoolers and that they (teachers) are important role models for healthy eating and physical activity. The majority of teachers also reported that IMIL was important to them. Forty-seven percent (47%) of teachers found some degree of challenge to incorporating IMIL into daily lesson plans, yet over 90% reported feeling comfortable implementing the activities. Almost all (97%) teachers reported seeing an increase in preschoolers talking about and asking about Choosy (the IMIL character mascot). Importantly, 85% of teachers reported that they had seen some/a lot of educational improvement, such as improved behavior, increases in child interests in nutrition and active play, and improved attention span, as a result of implementation of the IMIL program.

Qualitative themes around the specific challenges included more time to incorporate the activities into the daily classroom routines; additional resources to implement the activities, such as including more Choosy dolls and music CDs; and support/ideas to expand the activities in the

TABLE 1
Head Start Caregivers and Teachers Demographic Characteristics

	Caregivers		Teachers	
	Count	%	Count	%
Age				
18-29	72	28.9	14	30.4
30-39	119	47.8	10	21.7
40-49	22	8.8	12	26.1
50-59	12	4.8	7	15.2
60+	5	2.0	3	6.5
Race				
White	177	71.1	41	89.1
African American/Black	37	14.9	3	6.5
Asian	11	4.4	1	2.2
American Indian	3	1.2	0	0.0
Ethnicity				
Hispanic/Latino/Spanish Origin	58	23.3	1	2.2
Non-Hispanic/Latino/Spanish Origin	188	75.5	41	89.1
Education Level				
Did not graduate high school	25	10.0	-	-
Graduated high school	81	32.5	-	-
Some college	56	22.5	-	-
College degree	74	29.7	-	-
Teaching Experience (years)				
2 years or less	-	-	5	10.9
3-5 years	-	-	18	39.1
6-10 years	-	-	5	10.9
More than 10 years	-	-	18	39.1

Note. 1 teacher did not indicate race, 4 did not indicate ethnicity

classroom with more intentional integration in daily lesson plans and specific take-home activities (and music) for caregivers to engage the children at home. Teachers identified the need for more caregiver engagement with the IMIL activities, and suggestions for child engagement at all levels of ability (adaptations). Strengths identified by teachers were the motivation and fun of the music along with the connection to the Choosy mascot, which led to the children's increased awareness of health, physical activity, and nutrition. Themes of qualitative responses and sample quotes are provided in Table 3.

Caregivers

Table 2 summarizes caregiver responses to the IMIL survey. Two-thirds (66%) of caregivers reported that they were not at all familiar or only slightly familiar with both the IMIL and the 5-2-

1-0 programs provided by HS. Additionally, 58% reported not incorporating any of the 5-2-1-0 behaviors at home, although a majority of caregivers indicated that they read (94%) and highly valued (52.6%) the nutrition and health information provided by HS. Interestingly, only 44.5% of caregivers stated that they found this information to be very important. Nearly 80% of caregivers also reported that the information provided by HS was easy to understand.

Qualitative responses provided by caregivers included wanting more information on how to deal with picky eaters, portion control guidelines for children, healthy/easy recipes (such as macaroni and cheese, smoothies, and recipes hiding vegetables in food), suggestions for getting children to try new foods, label reading at the grocery store, dental care, and a report on the child's overall day.

TABLE 2

Head Start Teacher* and Caregiver** Survey Responses

Teacher Survey				
	Strongly Disagree	Disagree	Agree	Strongly Agree
	% (f)	% (f)	% (f)	% (f)
I can influence food preferences of preschoolers	0 (0)	6.5 (3)	60.9 (28)	32.6 (15)
I can influence child physical activity	0 (0)	0 (0)	39.1 (18)	60.9 (28)
I have seen an increase in preschoolers asking for Choosy since program implementation	0 (0)	2.2 (1)	45.7 (21)	52.2 (24)
	Not Important	Slightly Important	Moderately Important	Very Important
	% (f)	% (f)	% (f)	% (f)
Teacher perception of the importance of their role in nutrition education	0 (0)	2.2 (1)	26.1 (12)	71.7 (33)
Importance of role in guiding physical activity with preschoolers	0 (0)	0 (0)	19.6 (9)	80.4 (37)
Importance of IMIL to teacher	0 (0)	2.2 (1)	41.3 (19)	56.5 (26)
Importance of 1-1 coaching to help with IMIL implementation	32.6 (15)	41.3 (19)	19.6 (9)	6.5 (3)
	Not comfortable	Slightly comfortable	Moderately comfortable	Very Comfortable
	% (f)	% (f)	% (f)	% (f)
Teacher comfort implementing physical activity and nutrition	0 (0)	8.7 (4)	30.4 (14)	60.9 (28)
	Not challenging	Slightly challenging	Moderately challenging	Very Challenging
	% (f)	% (f)	% (f)	% (f)
Degree of challenge incorporating IMIl into classroom	50 (23)	30.4 (14)	13 (6)	4.3 (2)

	No improvement	Very little improvement	Some improvement	A lot of improvement
	% (f)	% (f)	% (f)	% (f)
Improvement in educating success resulting from IMIL	0 (0)	13 (6)	71.7 (33)	13 (6)
	Caregiver Survey			
Caregiver Familiarity with IMIL and 5210 healthy behavior messages	Not at All	Slightly	Somewhat	Extremely
	% (f)	% (f)	% (f)	% (f)
IMIL	40.6 (101)	23.3 (58)	24.5 (61)	9.6 (24)
5210	54.6 (136)	12 (30)	20.1 (50)	11.6 (29)
	Never	Rarely	Sometimes	Always
	% (f)	% (f)	% (f)	% (f)
Family Incorporates 5210 behaviors at home	53 (132)	5.2 (13)	28.5 (71)	13.3 (33)
Child talks about IMIL at home	49.8 (124)	14.9 (37)	22.1 (55)	10 (25)
How often do kids talk about CHOOSY at Home?	28.1 (70)	18.9 (47)	36.5 (91)	15.7 (39)
caregiver uses nutrition info provided by Head Start	7.6 (19)	16.5 (41)	53.8 (134)	20.9 (52)
	Not important/ not value % (f)	Low importance/ value a little % (f)	Moderately important/ Somewhat valued % (f)	Very important/ Value a lot % (f)
Importance of Head Start nutrition /health info to family	8.4 (21)	8.8 (22)	36.5 (91)	44.6 (111)
Value of Head Start nutrition/health info to family	2.8 (7)	11.6 (29)	30.5 (76)	52.6 (131)
	Very difficult to understand	Somewhat difficult to understand	Slightly difficult to understand	Easy to understand
	% (f)	% (f)	% (f)	% (f)
Understanding of nutrition education materials supplied by Head Start	3.6 (9)	2.8 (7)	10.4 (26)	79.5 (198)
		No % (f)		Yes % (f)
Caregivers read nutrition education materials sent home by Head Start		4.4 (11)		94 (234)

Note. * n = 46, ** n = 249. % indicates percentage of responses. f indicates frequency of responses. *IMIL = I Am Moving I Am Learning.*

TABLE 3
Qualitative Quotes and Themes from Head Start Teachers

Questions	Theme	Sample Quotes
What specific challenges do you have implementing IMIL?	**Time** - represent the time needed to review and incorporate activities into daily classroom routines	"Having time to fit it (IMIL) in with everything else we have to do"
	Resources/support - represents supplies and materials needed to effectively implement the IMIL program	"I wish there were more songs and videos to implement into the classroom"
	Caregiver engagement	"Wish we had the ability to teach Caregivers the songs and copy the CDs"
	Student challenges - represents the challenges teachers face with student engagement/behaviors during and after program implementation	"I have some trouble with physical activities just getting the kids to follow directions"
What resources or supports do you need to implement IMIL?	**Program materials** - represents handouts, videos, posters, dolls, songs that reinforce program concepts	"More Choosy songs and activities for the students"
	Purposeful integration - represents a strategic plan for integrating IMIL into the current Head Start curriculum	"More planned Choosy activities"
	Caregiver support - represents resources/strategies to engage Caregivers in the IMIL program and ensure continually from school to home	"Not enough take-home activities so that the students get exposure at home and get their Caregivers/caregivers involved"
What are the strengths of IMIL?	**Music motivation** - represents the songs/music	"The music encourages movement"
	Health awareness - represents students increased awareness of health, nutrition, and physical activity	"Enjoyable way for kids to be aware of their health"
	Program mascot - represents Choosy, the IMIL character/program mascot	"Kids love to sing and learn from Choosy"

Nutrition Specialist Classroom Observations

Two HS nutrition specialists conducted structured observations in 25 HS classrooms. They noted that the majority of the classrooms observed were actively using the IMIL mascot, Choosy, and the musical CDs. They reported that many of the teachers were using videos associated with the IMIL program (found on YouTube), but were not modeling the physical activities for the children, instead using this as a time for class preparation or socialization. They relied on the video to guide the movement. Nutrition Specialists reported that teachers engaged in limited discussions on food and nutrition during meal/snack times. With the exception of one learning center, the IMIL and 5-

2-1-0 posters and visual displays were not present or visible on the date(s) of the observations. Table 4 summarizes the nutrition specialists' observations.

TABLE 4

Head Start Nutrion Specialist Classroom Observations of IMIL

	No % (f)	Yes % (f)	Not Observed % (f)
Choosey Program posters easily visible	88 (22)	12(3)	
5210 posters displayed	72 (18)	28 (7)	
Choosy incorporated into classroom	36 (9)	64 (16)	
Choosy doll and/or CD used in classroom	16 (4)	84 (21)	
Teachers are engaged in IMIL activity	4 (1)	32 (8)	64 (16)
Teachers discussed healthy food choices with children at mealtime	40 (10)	48 (12)	12 (3)
Teacher displays positive attitude toward nutrition/ food/ healthy eating	20 (5)	76 (19)	4 (1)
Teacher displays positive attitude towards physical activity	24 (6)	44 (11)	32 (8)
Children happy/ enthusiastic during physical activities	32 (8)	64 (16)	4 (1)
Children happy/ enthusiastic in the nutrition activities	44 (11)	56 (14)	0 (0)

	Not at all % (f)	A little % (f)	A lot % (f)	Not observed % (f)
Teacher appears knowledgeable about IMIL	24 (6)	28 (7)	28 (7)	20 (5)
Teacher appears knowledgeable about 5210	64 (16)	8 (2)	8 (2)	20 (5)

Note. n = 25

DISCUSSION

The results of this mixed methods study suggest that HS teachers acknowledge that physical activity and nutrition education are important to the preschool population and are cognizant of their role in increasing child physical activity and healthy food choices through the preschool program. The majority of teachers recognized the importance of IMIL programming in their classroom, however, many of the teachers found it challenging to incorporate IMIL into daily lesson plans and had difficulty aligning the IMIL program with current curricular guidelines,

outside of the activities that were embedded into the curriculum once per week. Teachers felt they needed dedicated time to better identify strategies for integrating the program into the classroom curriculum, as well as identifying the need for additional/ supplemental supplies and resources and focused coaching for effective and ongoing implementation. These findings are consistent with other research on the implementation of the IMIL program within HS, citing insufficient training and time as two major barriers to sustainable implementation (Fox et al., 2010). One recent study utilized annual teacher/teacher aide professional development training for IMIL implementation following a local policy change requiring IMIL in daily lesson plans (Zahnd et al., 2017). A previous evaluation report indicated that teachers desire more materials and resources, additional and more detailed instructions about how to implement IMIL activities, and guidance on how to assess and monitor children's movement skills (Fox et al., 2010). The current evaluation also highlighted teachers' concerns of not having enough time to implement IMIL activities throughout the program day. Additionally, the Choosy mascot was seen as an integral component of program implementation among children served by the program. Previous research has highlighted the use of mascots and cartoon media characters as an effective strategy for increasing a child's appetite, preference for, choice and intake of healthy foods, in comparison to no character branding (Kraak & Story, 2015). The utilization of the IMIL mascot was noted by both Caregivers and teachers to be effective in engaging children in physical activity and healthy eating discussions.

Classroom observations in this study highlighted the fact that many teachers were not modeling the physical activities or participating in the meal with the children, instead using this as a time for class preparation. This highlights a need to explore barriers or facilitators to demonstrating movement and healthy eating as part of the implementation of IMIL. Previous research has shown that school staff serve as healthy role models and students are more likely to practice those healthy behaviors if they see teachers/staff engaging in those as well (Action for Healthy Kids, 2015). Gehris, Gooze, and Whitaker (2015) found that teachers and children benefit from moving together because it motivates children and promotes teacher–child relationships, as well as other important benefits. Staff wellness programs offered through HS may provide an opportunity for teachers to learn movement skills and increase competence and confidence in demonstrating movements in the classroom, which may translate to positive role-modeling and subsequent improvements in student health (Hibbs-Ship et al., 2015).

HS caregivers in this study placed high value and importance on nutrition and health information disseminated by the HS program. The majority acknowledged that they viewed the nutrition education materials disseminated by HS, yet most caregivers were unfamiliar with the IMIL and 5-2-1-0 programs. Nearly half of caregivers did not translate the 5-2-1-0 health information and messages into health behaviors at home. Recent research has identified similar findings around caregivers' lack of understanding of 5-2-1-0 health messaging used in preschool programs and the need for practical strategies for initiating behavior change at home (Nicely, et al, 2019). Additionally, classroom observations revealed that the 5-2-1-0 posters and IMIL Choosy posters were not displayed in most of the classrooms. Despite caregivers reporting that the nutrition education materials were easy to understand, caregiver knowledge and awareness of 5-2-1-0 healthy eating, active living messaging and the IMIL program was limited, likely due to the lack of clear signage seen in the classroom connecting the activities and behaviors from school to home. Signage that is clear on the purpose and is familiar, has been shown to be effective in creating behavior change (Meis & Kashima, 2017).

One published report examining the effectiveness of IMIL implementation identified a high level of caregiver awareness with IMIL (Fox et al., 2010). The difference between that region's implementation and the HS program utilized in this study was the targeted caregiver focus of the program. The HS program evaluated for this study relied predominantly on written information disseminated to caregivers in weekly home folders or through enrolled children's backpacks as the primary means of caregiver engagement in the IMIL program. Caregiver familiarity with the program elements would be a precursor to program replication in the home environment. Additionally, teachers in this study identified that higher levels of caregiver engagement would improve program implementation. Teachers acknowledged that IMIL activities replicated at home would improve overall program effectiveness and outcomes. Teachers recommended caregivers receive copies of musical CDs and a list of physical activities to use at home. A caregiver workshop on the use of the materials in encouraging physical activity and healthy food choices at home would also be an important component for caregiver engagement, rather than providing materials alone. Previous research has shown that caregiver engagement and personalized resources can assist in translating knowledge and skills into home settings which can improve outcomes related to obesity prevention in children (Fitzgibbon et al., 2012; Pathirana et al., 2018) and is an important program enhancement for IMIL implementation (Hoard, 2007).

Limitations

A strength of this evaluation was the triangulation of data, in which the caregivers and teachers were surveyed in conjunction with structured observations conducted by the program nutrition specialists, examining the use and implementation of IMIL within each classroom. A limitation of this study was that the evaluation examined only one program in the Midwest. As such, the results may not be representative of other programs who have implemented the IMIL program. However, scant research has been published around the implementation of IMIL in HS. Additionally, while the caregiver response rate to the survey was high, no data was collected from caregivers who did not respond, so it is uncertain if they would have provided different answers or perspectives.

IMPLICATIONS

This study highlights the importance of evaluation for obesity prevention programming for preschoolers. However, there is a dearth of research around obesity prevention efforts in preschool children, particularly low-income children where higher rates of obesity are seen. Our findings accentuate the need for additional, targeted preschool strategies and resources that promote teacher modeling of physical activity and discussion of healthy eating and nutrition during mealtime. It also highlights the need for purposeful engagement of caregivers utilizing visuals and movement resources to translate IMIL and 5-2-1-0 physical activity and nutrition messages at home for caregivers. Moreover, the Choosy mascot appeared to be an effective and integral component of the IMIL program to engage children in physical activity and healthy eating discussion. In light of our findings, more research is needed to better understand the barriers teachers face in demonstrating movement activities with children. A qualitative study may be recommended in order to generate rich, descriptive data around this topic. Additionally, health education and

promotion policies and strategies, such as a wellness program for HS teachers and staff, may enhance competence of teachers in engaging in physical activity, which then may translate to teacher comfort and confidence in role-modeling IMIL activities in the classroom.

Findings also indicated that caregivers are highly interested in receiving nutrition information from HS, yet were unfamiliar with the IMIL program and 5-2-1-0 messaging. The HS program implementation evaluated for this study utilized weekly written educational material as the main form of caregiver engagement. This form of information dissemination did not result in high levels of caregiver familiarity with the program, and as such, a broader examination is needed to explore the types of messages and information dissemination strategies that best resonate with caregivers. This study highlights that future research needs to focus on targeted caregiver/family programming to increase MVPA and healthy food offerings and selections outside the structured school setting. Caregiver engagement in programming has the potential to be a significant factor in eliciting long-term child and family behavior change to prevent and reduce obesity, and should be the focus of future IMIL program implementation and evaluation along with further examination of strategies to promote proper implementation of the program across HS locations.

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