

Assessment of Indoor Air Quality and Cleaning Behaviors in Urban Child Care Facilities



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The project described was supported by the National Center for Advancing Translational Sciences, National Institutes of Health, Award Number 2UL1TR001436. The content is solely the responsibility of the author(s) and does not necessarily represent the official views of the NIH. This project is funded by the Research and Education Program Fund, a component of the Advancing a Healthier Wisconsin Endowment at the Medical College of Wisconsin.

Problem / Question

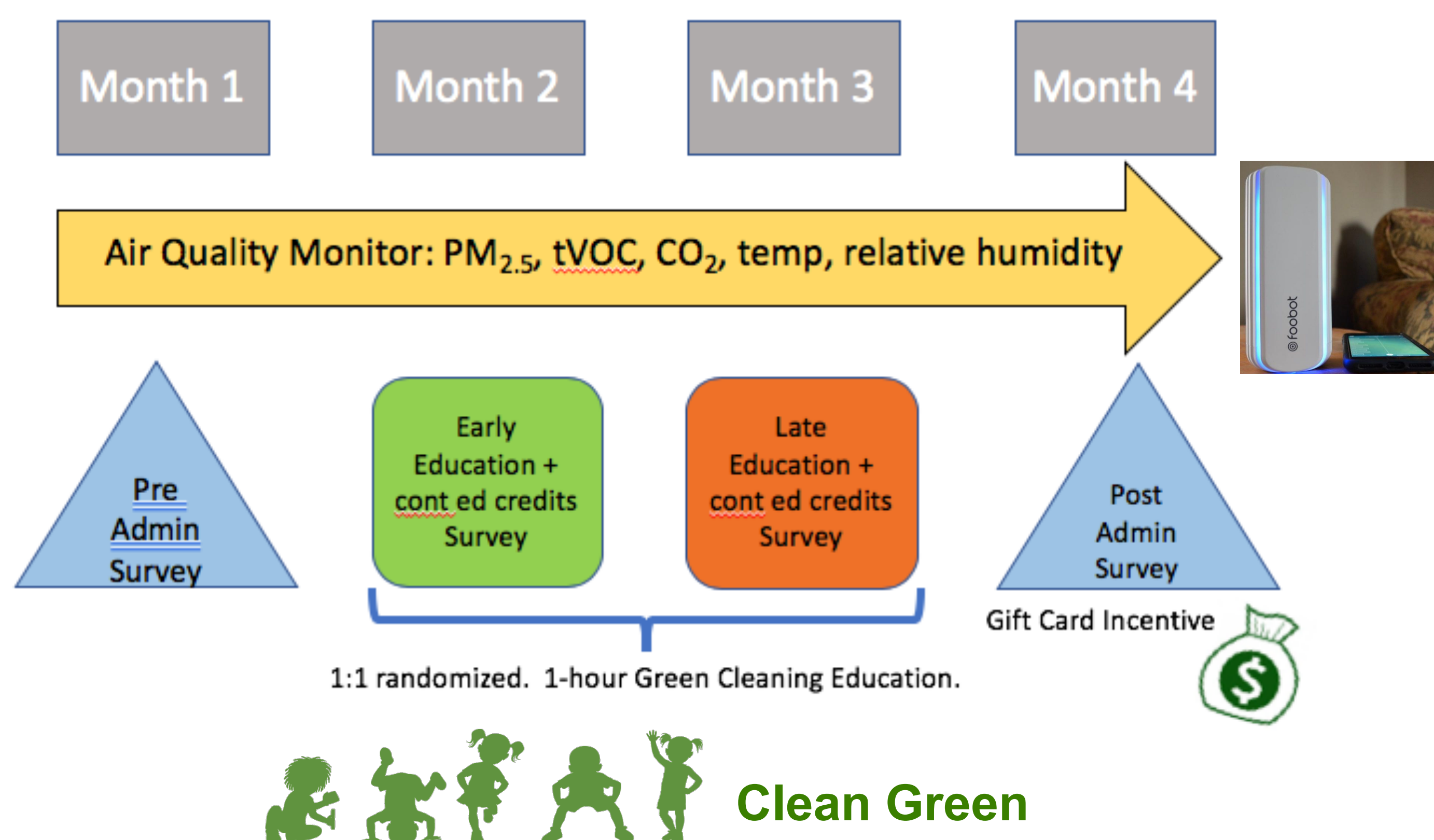
- Indoor Air Quality (IAQ) can be 5 times worse than outdoor air
- IAQ is associated with wheeze and asthma development
- Wisconsin childcare centers have unregulated IAQ
- Pre-school children spend most of their time indoors, often at childcare centers
- Asthma hospitalizations and ED visits are highest for pre-school aged children

Project aims:

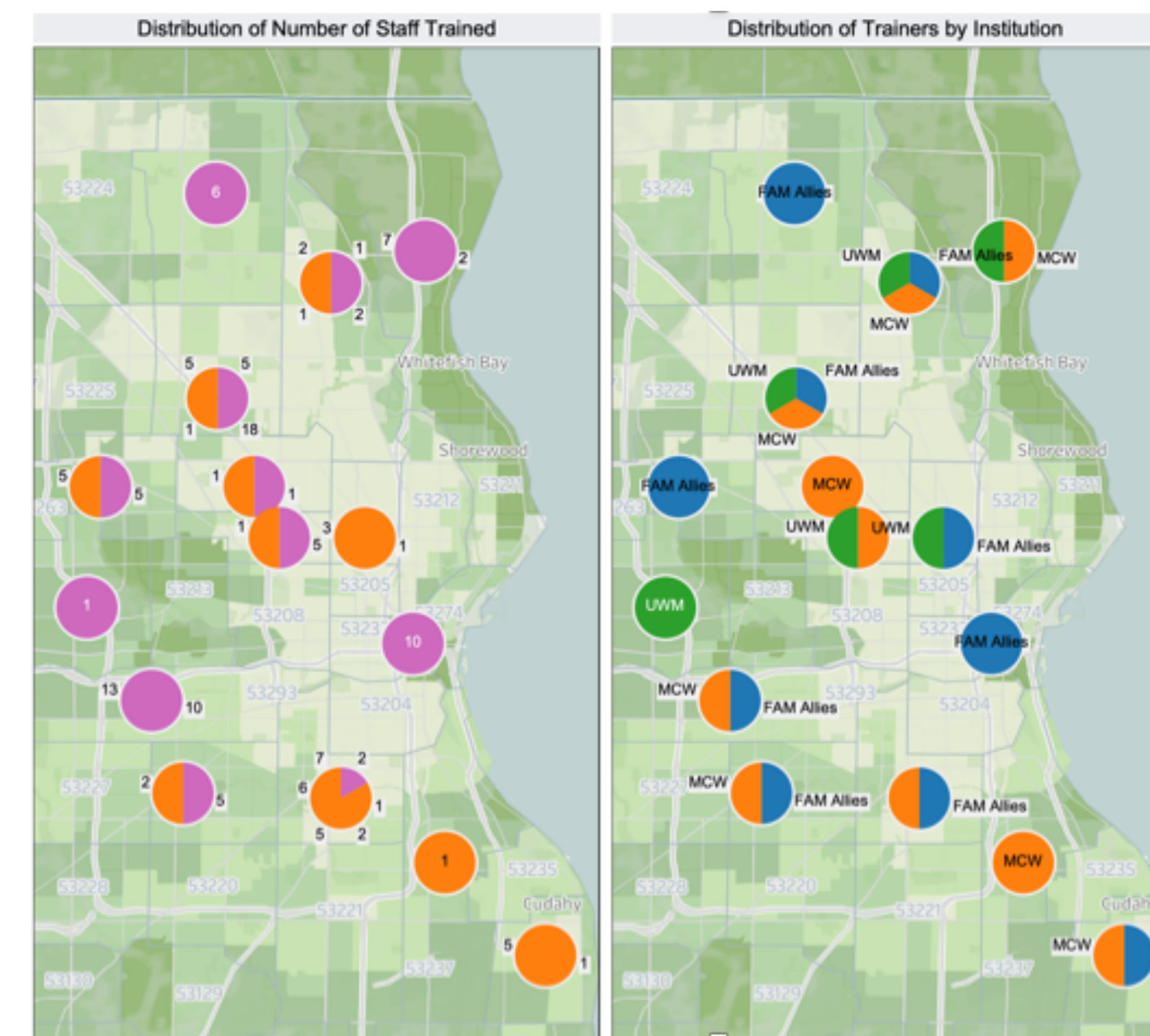
- Characterize baseline IAQ in childcare centers
- Assess behaviors that affect IAQ
- Determine influence of education on behaviors and IAQ

Project Overview

INTERVENTION: 36 Centers



Methods



33 centers completed:
Family centers (≤8 kids)
Group centers (>8 kids)
 Household income increasing from light green to dark green

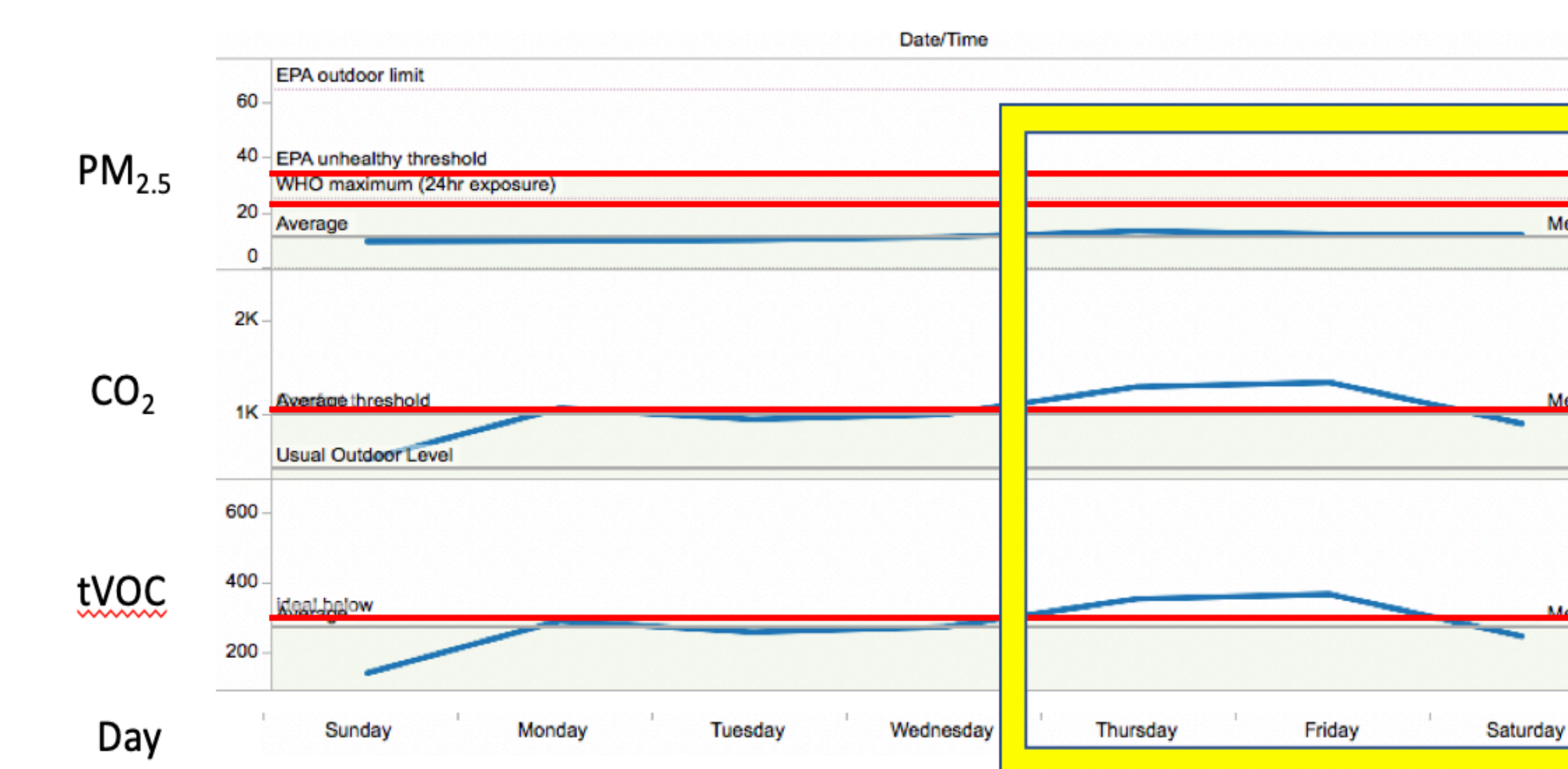
15 Instructors from:
4, FAM Allies, local nonprofit
8, UWM Nursing students
3, MCW Community Health Workers

Observations

Carbon Dioxide (CO₂) and Volatile Organic Compounds (tVOC) increased during each day:

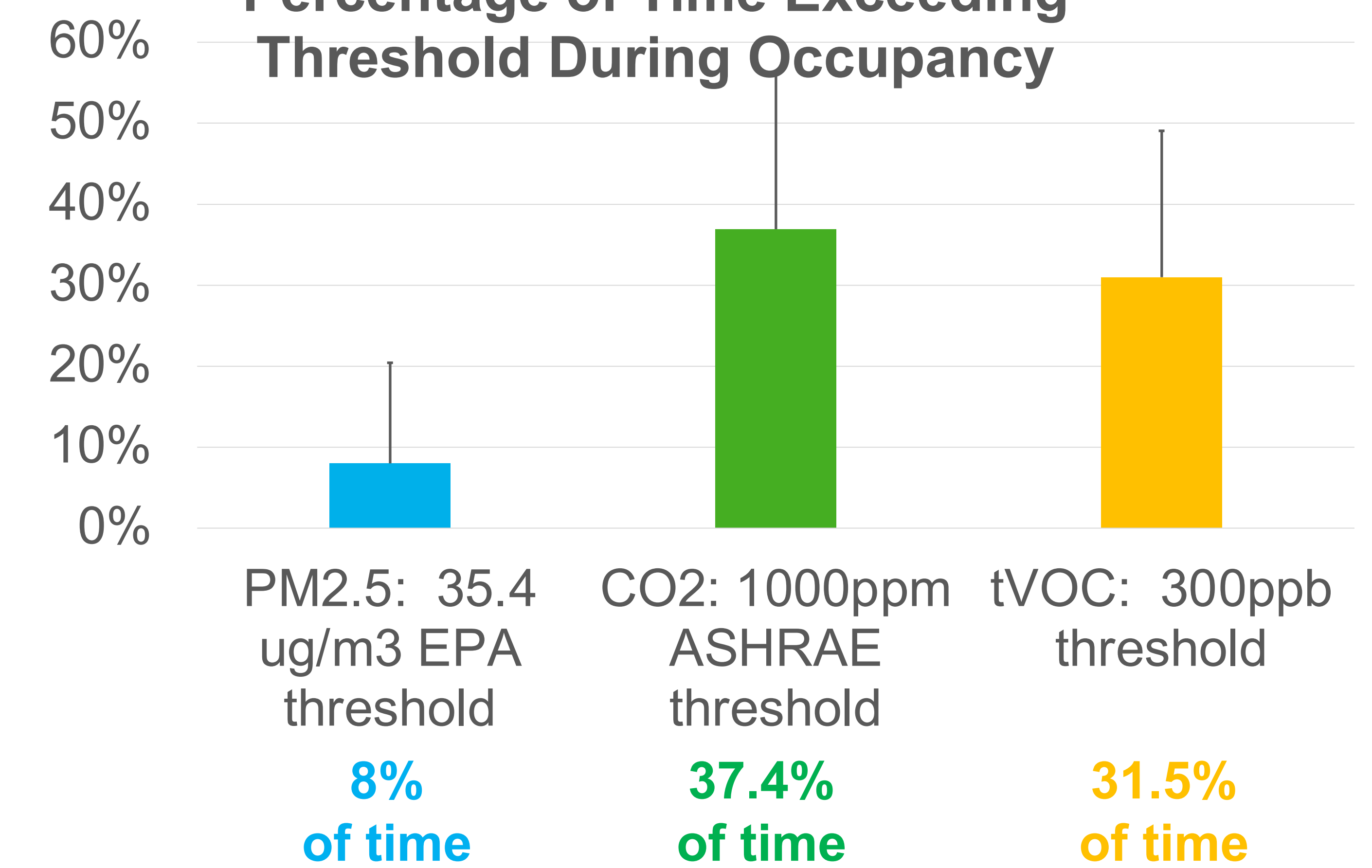


Carbon Dioxide (CO₂) and Volatile Organic Compounds (tVOC) increased during each week:



Results

Percentage of Time Exceeding Threshold During Occupancy



Exceedences found for PM_{2.5}, CO₂, and tVOC during operational hours.

Conclusions

- Average CO₂ and tVOC increased during each day and during each week.
- Exceedences found for PM_{2.5}, CO₂, and tVOC during operational hours.
- Education did not alter behaviors or IAQ.
- Education was feasible and well accepted.

Works Cited

IAQ Threshold Criteria:

- Salthammer, T., 2011. Critical evaluation of approaches in setting indoor air quality guidelines and reference values. *Chemosphere*, 82(11), pp.1507-1517.

IAQ related to Wheezing /Asthma, Major References:

- Burbank AJ, Sood AK, Kesic MJ, Peden DB, Hernandez ML. Environmental determinants of allergy and asthma in early life. *J Allergy Clin Immunol*. 2017;140(1):1-12. doi:10.1016/j.jaci.2017.05.010
- Bernstein JA, Alexis N, Bacchus H, et al. The health effects of nonindustrial indoor air pollution. *J Allergy Clin Immunol*. 2008;121(3):585-591. doi:10.1016/j.jaci.2007.10.045

Cleaning Products related to wheezing:

- Heavy use of cleaning products have been associated with respiratory health in young children:
- Frequent use of household cleaning products in early life was associated with an increased risk for child-hood wheeze and asthma but not atopy at age 3 years.
- Parks, J., McCandless, L., Dharma, C., Brook, J., Turvey, S.E., Mandhane, P., Becker, A.B., Kozyrskyj, A.L., Azad, M.B., Moraes, T.J., and Lefebvre, D.L., 2020. Association of use of cleaning products with respiratory health in a Canadian birth cohort. *CMAJ*, 192(7), pp.E154-E161.
- Sherriff, A., Farrow, A., Golding, J. and Henderson, J., 2005. Frequent use of chemical household products is associated with persistent wheezing in pre-school age children. *Thorax*, 60(1), pp.45-49.

References for quality of data from Foobot:

- Sousan S, Koehler K, Hallett L, Peters TM. Evaluation of consumer monitors to measure particulate matter. *J Aerosol Sci*. 2017;107:123-133. doi:10.1016/j.jaerosci.2017.02.013
- Singer B, Delo W. Response of consumer and research grade indoor air quality monitors to residential sources of fine particles. *Indoor Air*. 2018;28(4):624-639. doi:10.1111/ina.12463
- District S. Air Quality Sensor Performance Evaluation Center. 2019.
- Moreno-Rangel A, Sharpe T, Musau F, McGill G. Field evaluation of a low-cost indoor air quality monitor to quantify exposure to pollutants in residential environments. *J Sensors Sens Syst*. 2018;7(1):373-388. doi:10.5194/jsss-7-373-2018

Survey Results

- Common Tools:** Dusters, Wet Mops, Vacuums
- Common Cleaners:** Bleach, Bathroom cleaner, Floor cleaner
- Timing:** Non-business hours, except for floor sweeping
- Rare:** Ammonia Use, Pillow Washing, Carpet Cleaning
- Bleach:** typically measured and diluted rather than "eyeballed"
- Candles and incense were exclusively used in Family facilities, yet rarely used.
- Air freshener use common, more often in Group facilities.
- Plug-ins common in Family centers.

Background

- It is estimated that over one-third of children under the age of 5 in low-and-middle-income countries are at risk of not reaching their neurodevelopmental potential¹
- In Uganda, only 26% of children under the age of 5 are developmentally on track for literacy and numeracy¹
- The Malawi Developmental Assessment Tool (MDAT) was developed in 2010 due to the fact that other developmental assessment tools have unfamiliar terms and milestones which may yield misleading results²

Specific Aims

- To assess the program implementation of the MDAT tool at the Child and Family Foundation of Uganda
- To evaluate neurodevelopment in children under 6 years old in Kampala Uganda

Methods

- Approval from the study was sought from the Institutional Review Board at the Medical College of Wisconsin and Mulago Hospital, as well as the Ugandan National Council of Science and Technology
- The implementation was conducted from June 2019 – August 2019 at the Child and Family Foundation in Kampala, Uganda
- Implementation of the program included a week of structured sessions to identify proper means of assessing each step of development, scoring each session, and score interpretation by age defined developmental milestones, and several practice sessions
- Parents who brought their children to the Friday immunization clinic were offered the free neurodevelopmental screening for their children
- We determined when to implement the assessment with consideration given to work flow of the clinic
- Components involved learning about cultural norms, how to work with a translator, and data entry & quality checks into KoboCollect
- Demographic information including Malaria and TB history, HIV status of mom and child, and home life was collected from the caregiver to determine what could impact neurodevelopment

Results

Challenges:

- Testing the child's skill in performing the task rather than English comprehension
- Ensuring interpreters were properly translating and administering the tool
- Ensuring the caregiver was not over-instructing and influencing the child's performance
- Caregivers did not know the answers to the demographic questions ex: APGAR score or child's HIV status
- Having adequate spaces free of distractions
- How to answer demographic questions without access to an EMR
- Using KoboCollect correctly

Unique Barriers Faced:

- Patient population was largely correlated to the vaccine clinic which was dependent on availability of vaccines
- Due to broken refrigerator, vaccine supply was dependent on a near-by clinic's supply, limited days the vaccines could be offered, and increased the cost of vaccines

| D SOCIAL | | | | | |
|--|--|--|--|--|--|
| 1. Smiles but not at a particular person... | 2. Smiles in response to a person. | 3. Frowns with mother or caregiver in response to being played with. | 4. Frowns alone, happily moving body and kicking legs in a happy way. | 5. Recognises or settles (quiets) with caregivers/known family members. Stops crying or quiets when mum or another known carer takes the baby. | 6. Will take phala (porridge) from a spoon when fed by a caregiver |
| 7. Helps hold a cup while mum gives a drink. | 8. Stretches to be picked up. | 9. Can HOLD a spoon with phala (porridge) but NOT get to mouth well yet. | 10. Drinks from a cup by self without spilling. | 11. Is able to indicate by pointing that they want something. | 12. Can eat by picking up morsels (of nsima/maize) made by mum. |
| 13. Puts hands out to be washed by mum or carer - helps by putting hands out. | 14. Can hold a spoon and take phala (porridge) by self but spills some/a little bit | 15. Indicates in some way the need for a poo or a pee. For example by crying, pulling at pants or saying something... | 16. Wants to join in singing games. Ask "Does the child like to be included in singing games even if he/she can not yet do them?" | 17. Able to greet either by extending hand or verbally. | 18. Understands to share things with others and will do so if with friends or family and asked to share. |
| 19. Does a poo or a pee by themselves without wetting their pants. | 20. Eats phala (porridge) off a spoon without spilling. | 21. Can make own morsels of nsima/maize and put in mouth (often with relish) | 22. Is able to undress by themselves - can take off even one item of clothing, e.g. shorts or skirt...need to be able to remove it completely. | 23. Wants to go and visit a friend's house... shows independence | 24. Can go to the toilet by themselves anywhere (not necessarily at the pit latrine) |
| 25. Can eat food or relish with bits or bones in it such as fish with bones or tangerines with seeds | 26. Is able to dress but not completely. Can put on at least one item e.g. T shirt/skirt | 27. Washes hands well by self before/after eating | 28. Knows how to keep quiet at important meetings or ceremonies. | 29. Does household chores in a useful way e.g. drawing water or hoeing... could be even a small amount of help but not just pretend. | 30. Able to dress by self completely. May need help with buttons, shoe laces or zips. |
| 31. Understands the concept of discipline e.g. causes and consequences such as that saying bad words might lead to punishment... | 32. Plays games with turn taking such as fufu/ye, mira, jingo. | 33. Knows how to be respectful to elders. Is polite and shows respect such as putting hands together or kneeling before elders | 34. Can go to the toilet or pit latrine by self. | | |

© MDAT Research Team

Figure 1. MDAT Social Screening Tool²

Milestones Unique to MDAT Compared to Western Culture Developmental Tools

Fine Motor Milestones

- Making car out of wire
- Making a pattern with bottle tops
- Sorting out maize/beans

Social Milestones

- Able to conduct chores around the house
- Participating in helping the caregiver
- Pretend play involving household chores
- Respect of elders
- Able to go to the latrine/toilet by themselves, anywhere (not necessarily on the toilet)

Language Milestone

- Able to stay quiet during important ceremonies
- Sharing with others
- Able to greet other by shaking their hand
- Two syllable recall with Pa, Chi, Tu, Go



Image 1. Friday Vaccine Clinic



Image 2. Study staff conducting the tool

Conclusion

- Implementation of a neurodevelopmental assessment program in clinic has the potential for early detection of developmental delay in children that could lead to early intervention and drastic improvement of their quality of life
- There are no standardized screening programs to assess developmental outcomes in Ugandan children
- It is important to use a tool that is culturally appropriate in order to obtain accurate results
- Answers to demographic questions allowed for health interventions ex: HIV testing

Next Steps

- Continue to work with Child and Family Foundation of Uganda to implement developmental screening for early detection and improved quality of life
- Ensure standard operational procedures are continued to be established for consistent and accurate data collection
- Ensure that data collection does not interfere with the work-flow of the clinic
- Continue to integrate data collection into the clinic flow
- Implement the MDAT into a rural clinic to compare and contrast data to the urban clinics
- Future development of the MDAT throughout Kampala, as well as expanding the tool to other rural areas within Uganda will continue to provide data about neurodevelopment

Acknowledgements

Dr. Elaine Kohler Summer Academy of Global Health Research, the Medical College of Wisconsin Office of Global Health, The Child and Family Foundation Uganda, and Makerere University

Citations

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- Gladstone, Melissa, et al. "The Malawi Developmental Assessment Tool (MDAT): the creation, validation, and reliability of a tool to assess child development in rural African settings." *PLoS medicine* 7.5 (2010): e1000273.

BACKGROUND

- Early Head Start/Head Start (EHS/HS) is an evidence-based early childhood education and family support service program for low-income families with children birth to age 5 years.
- Tracking health information currently occurs through paper EHS/HS forms completed by pediatric practices and manually processed by EHS/HS centers.

OBJECTIVE

- Identify perspectives of parents/caregivers, EHS/HS staff, and clinical staff on medical and social information exchange between EHS/HS and pediatric practices.

METHODS

A qualitative approach with 3 key groups:

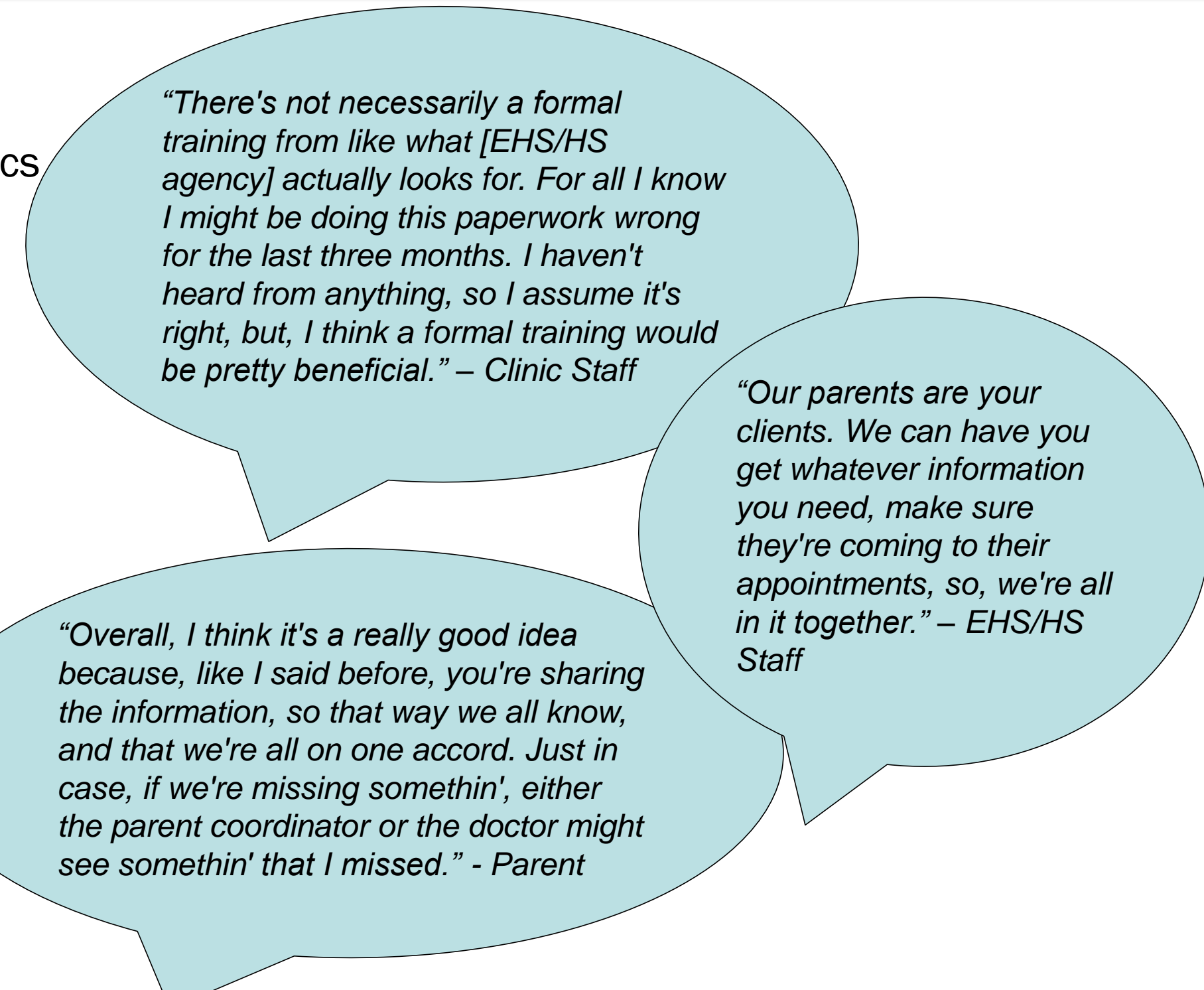
- Parents/Caregivers:**
 - 5 focus groups (Demographics in Table 1).
 - Inclusion criteria: ≥18 years, child enrolled in EHS/HS program, English-speaking.
- EHS/HS Staff:**
 - 3 focus groups.
- Clinical Staff:**
 - 8 semi-structured in-person interviews.
- Clinical and EHS/HS staff recruitment aimed for broad representation by roles/experience.
- Inductive qualitative analysis of transcripts from audio-recordings identified themes.

RESULTS

Table 1. Parent/Caregiver, EHS/HS Staff, and Clinical Staff Demographics

| N/Mean (%/SD) | Parents (n= 34) | EHS/HS Staff (n= 18) | Clinical Staff* (n= 8) |
|---------------------------|-----------------|----------------------|------------------------|
| Age | 32.8 (11.6) | 37.1 (11.7) | |
| 18-24 | | | 2 (25) |
| 25-34 | | | 3 (37.5) |
| 35-44 | | | 1 (12.5) |
| 45-54 | | | 1 (12.5) |
| 55-64 | | | 1 (12.5) |
| Gender | | | |
| Female | 30 (88.2) | 17 (94.4) | 7 (87.5) |
| Male | 4 (11.8) | 1 (5.6) | 1 (12.5) |
| Ethnicity | | | |
| Hispanic or Latino | 1 (3.0) | 2 (11.1) | 0 |
| Not Hispanic or Latino | 32 (97.0) | 16 (88.9) | 8 (100) |
| Race | | | |
| Asian | 2 (6.3) | 4 (25.0) | 1 (12.5) |
| Black or African American | 30 (93.8) | 10 (62.0) | 1 (12.5) |
| White | 0 | 2 (12.5) | 6 (75) |

* Clinical staff includes: 2 medical assistants, 3 registered nurses, 3 pediatricians or advanced practice providers



“There's not necessarily a formal training from like what [EHS/HS agency] actually looks for. For all I know I might be doing this paperwork wrong for the last three months. I haven't heard from anything, so I assume it's right, but, I think a formal training would be pretty beneficial.” – Clinic Staff

“Overall, I think it's a really good idea because, like I said before, you're sharing the information, so that way we all know, and that we're all on one accord. Just in case, if we're missing somethin', either the parent coordinator or the doctor might see somethin' that I missed.” - Parent

“Our parents are your clients. We can have you get whatever information you need, make sure they're coming to their appointments, so, we're all in it together.” – EHS/HS Staff

DISCUSSION

- Major themes included: knowledge gaps and workflow issues.
- Knowledge gaps included: health, EHS/HS and purpose of forms.
- Workflow issues included: interagency communication, roles, health physical forms, and parental involvement.

CONCLUSION

- Knowledge gaps and workflow issues exist between service sectors for children.
- Implement education to address knowledge gaps, electronic communication tools, and workflow changes to benefit families and staff.

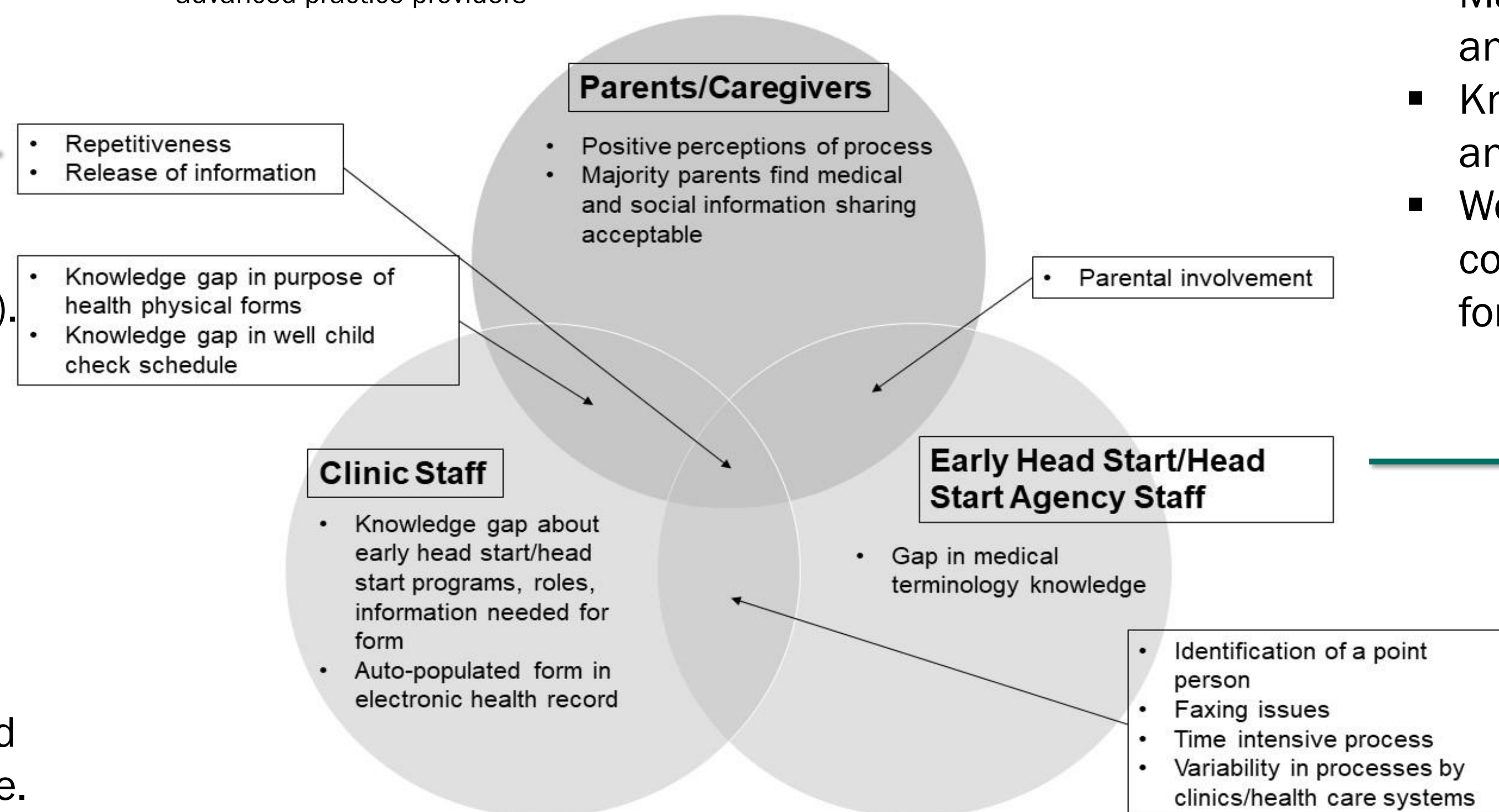


Figure 1. Unique and Common Subthemes Across Key Stakeholders

Background

- An estimated 18.3% of the U.S. population identifies as Hispanic or Latino (1), while the number of Latino students graduating from medical school remains around 4.6% (2).
- Innovative methods are needed to increase Hispanic and Latino exposure, interest, and representation in these fields.

Objective

- Our program aims to:
 1. Incorporate early exposure to science and medicine.
 2. Involve education and mentoring by current medical students.
 3. Spark an interest in and inspire the pursuit of STEM-related careers.

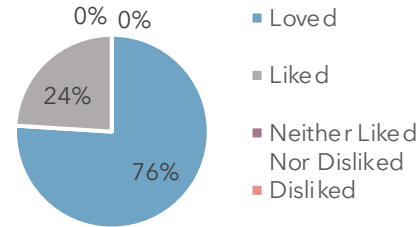
Methods

- The project was launched for the 8th grade class at St. Augustine Preparatory Academy, which provides education to predominantly Latino students.
- Several activities were led by MCW students throughout the year. Activities included:
 - an interactive presentation on eye anatomy, general eye health, and an introduction to a variety of potential STEM careers.
 - a collaborative cow eye dissection.
 - a visit to the STAR Center at MCW for clinical simulations.
- Students and teachers were asked to complete an anonymous evaluation upon culmination of the program so that improvements could be made for upcoming years.

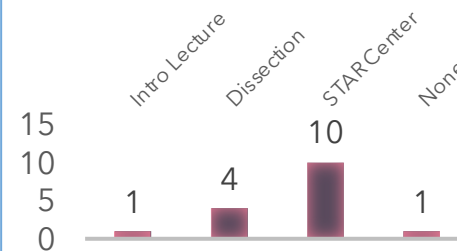
Results

- The entire class of 120 students participated in both the interactive presentation and the eye dissection. A group of 26/120 students who showed exceptional interest and motivation were selected by St. Augustine teachers for the STAR Center visit.
- Out of the 26 students who participated in all 3 events, 16 completed the anonymous evaluation.

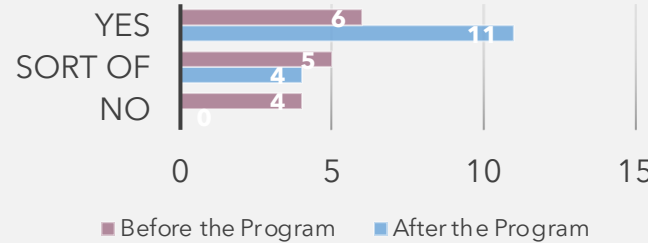
STUDENTS' OVERALL RESPONSE TO THE PROGRAM



STUDENTS' FAVORITE PART OF THE PROGRAM



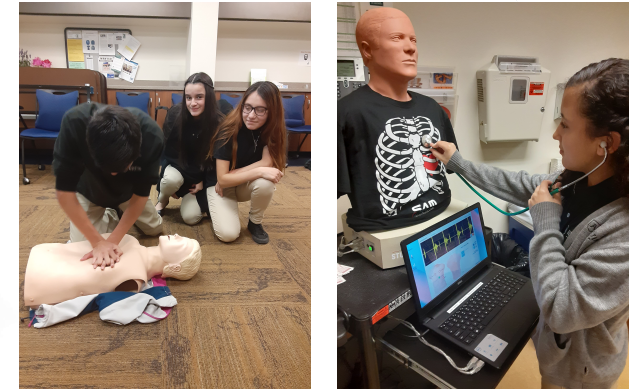
Interest in Science/Medicine



- Student **interest in science/medicine** increased from 40% to 73%.
- Both students and teachers especially appreciated the **hands-on** components.
- Teachers reported high **student engagement**, which corresponded with comments from the students reflecting a **joy in learning new things**.

Conclusions

- Creation and implementation of a pipeline program for mostly Latino middle school students was feasible, well-received, and may serve as a model that can be followed at other schools.
- The program was successful in exposing students to a variety of topics and careers in science and medicine and planting the seed for continued exploration in these areas.
- Mentorship and guidance from current medical students was beneficial for middle school students.



References

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Integrated Mental Health Curriculum: A Pilot Study

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INTRODUCTION

Longfellow Middle School is one of two middle schools in the Wauwatosa School District within the town of Wauwatosa, WI. There are roughly 600 students enrolled at Longfellow Middle School. Wauwatosa has a population of about 47,000 people and is in Milwaukee County, west of downtown Milwaukee. The Medical College of Wisconsin (MCW) is also located in the environs of Wauwatosa.

Mental health focused, skills-based curriculums have been shown to be effective at reducing problem behaviors at school in adolescents. One study¹ instituted their “integrated comprehensive school model for character development, problem behavior prevention, and academic achievement enhancement” through 15-20 minute daily lessons. They focused on the theories of self-concept and learning. The two study schools showed a decrease in disciplinary referrals by 78 – 85%,

Those with low levels of self-esteem may use negative coping skills to compensate for their lack of confidence and self-worth. Because self-esteem encompasses many entities of self-worth, it can be used as a global measure of mental health and measured quantitatively with Rosenberg’s Self-Esteem Scale².

PROJECT GOALS

1. Reinforce mental health topics and skills already being taught in the general education curriculum of Longfellow.
2. Teach new coping and mindfulness skills to the students, to compliment and expand on their existing skills.
3. Increase students’ self-esteem and decrease their negative coping behaviors via life skills acquisition.
4. Establish a curriculum that can be implemented on a continual, yearly basis with MCW’s community partner, Longfellow Middle School.

METHODS

- Needs assessment completed to determine most relevant topics
- Five lesson curriculum developed with focus on previously taught and most relevant topics
- Rosenberg self-esteem survey selected to measure growth
- MCW medical student volunteers recruited and trained to teach lessons
- Parental consent obtained for self-esteem survey data analysis
- All 7th grade Longfellow Middle School students received the curriculum
- Students completed survey in the middle of first lesson and at end of last lesson
- Pre- and post-survey average scores were calculated and compared
- Feedback surveys given to students, teachers, and medical student volunteers

RESULTS

Self-Esteem Survey Data

- Ninety-five pre-curriculum surveys with average score of 20.68 out of 30.
- Seventy-nine post-curriculum surveys with an average score of 20.66.
- There was no significant change in the average score between the beginning and end of the curriculum.

Student Feedback Survey Data: Middle of Curriculum

- 62% of students agreed or strongly agreed that they felt confident in helping a friend who was struggling.
- 10% of students indicated that they did not enjoy the lessons.

Student Feedback Survey Data: End of Curriculum

- 92% of students felt all or some of the topics covered in the MHC were relevant to 7th grade students

Medical Student Volunteer Feedback Data

- All students enjoyed or very much enjoyed their MHC experience.
- Sixty-four percent of students felt prepared or very prepared to teach their first session based on materials/ preparation provided.
- 91% percent of student volunteers agreed or strongly agreed that the teaching materials provided were adequate/sufficient to teach the lessons.

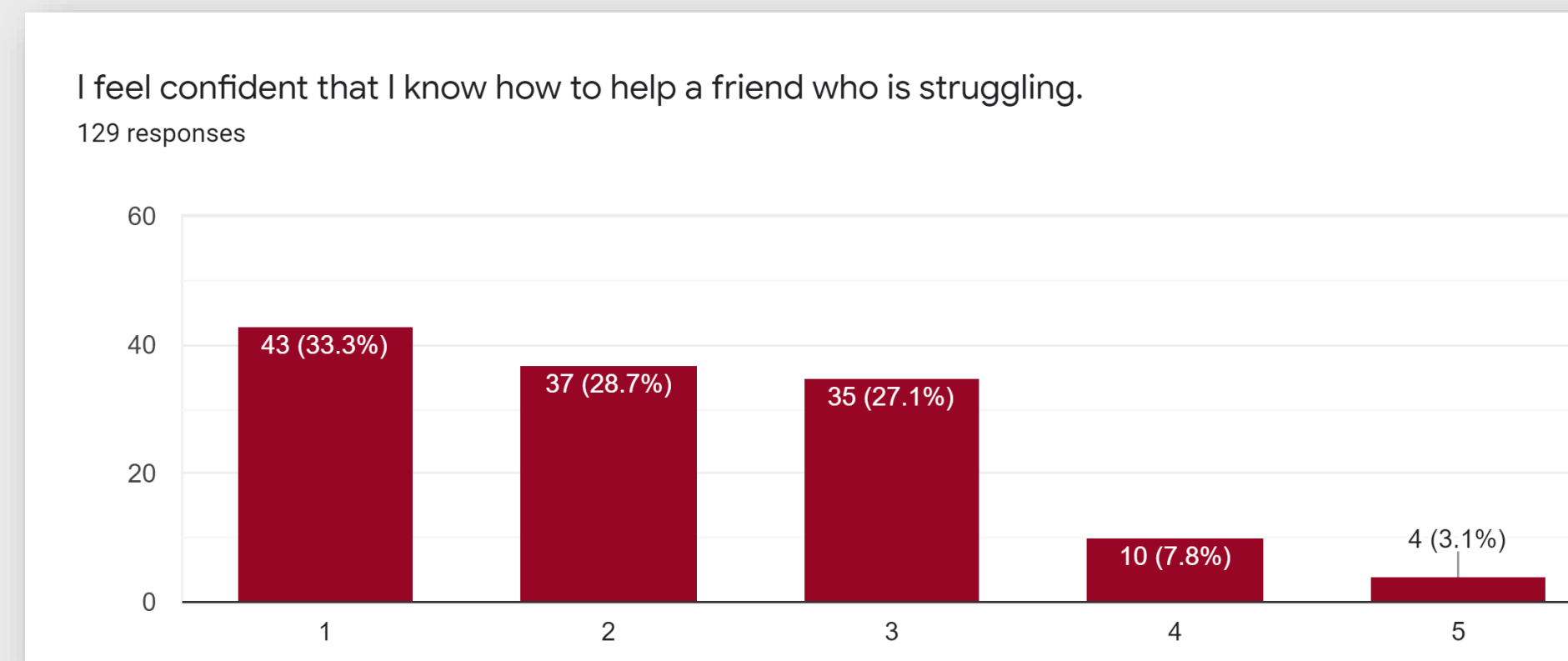


Figure 1. Mid-curriculum student feedback survey. 1= Strongly Agree, 5= Strongly Disagree

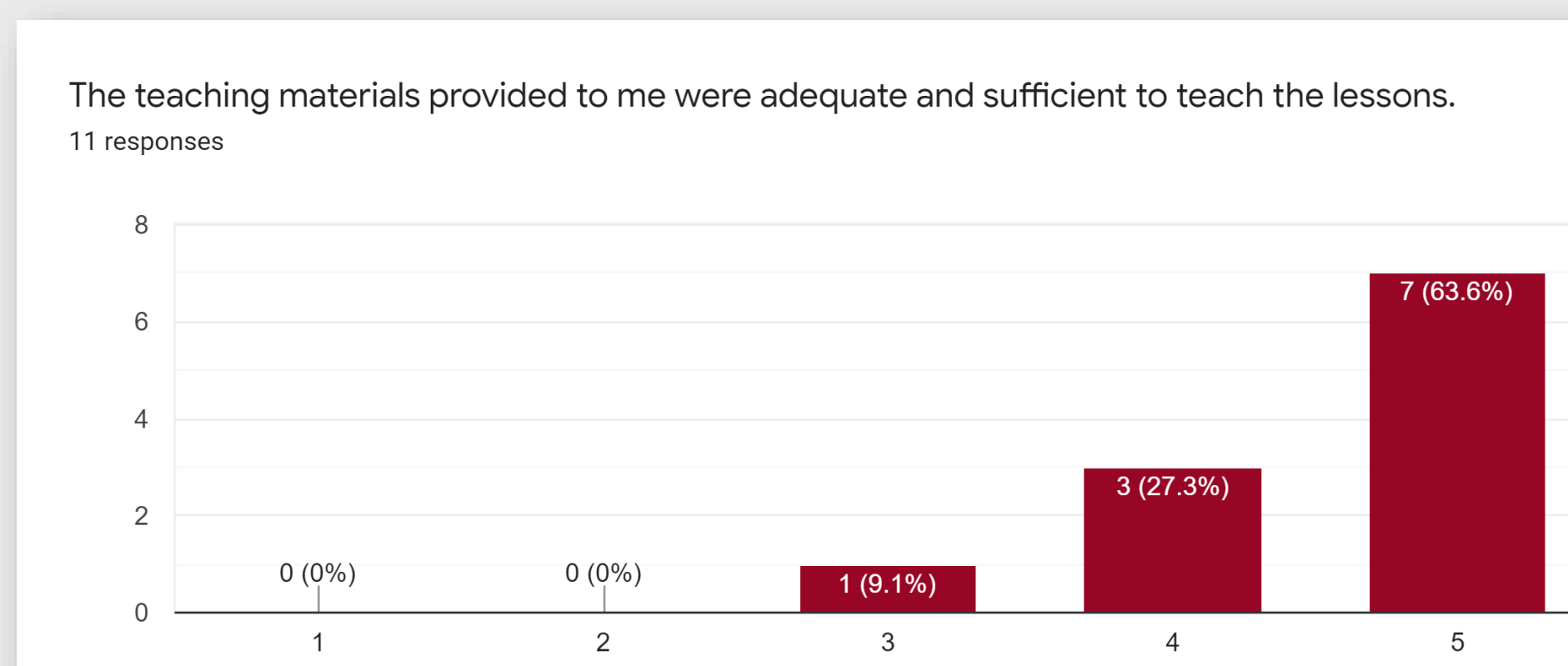


Figure 2. Medical student volunteer feedback survey. 1= Strongly Disagree, 5= Strongly Agree

DISCUSSION

The self-esteem survey scores did not show significant change from the beginning to end of the curriculum, which is somewhat expected as mental health is a complex entity that is difficult to measure. Additionally, this study had several statistical shortcomings, including a low consent rate and a poor survey response rate. Many surveys were unable to be analyzed as some surveys had names instead of ID numbers, were improperly filled out or where illegible. Additionally, some students were absent and therefore unable to fill out either a pre- or post-survey. Because our analysis only represents approximately one-third of students, it is possible that the curriculum led to a significant change in students’ reported self-esteem and our analyzed subset is not an accurate representation of the population.

Even though this was a pilot program with a brand-new partnership, this project was successful at teaching important topics/skills, engaging students and provided valuable teaching opportunities for medical students. One 7th grade student commented, “I feel that it was a LOT of fun, and that learning about this type of thing is really important.” Medical students also felt this experience was relevant and valuable. All medical student volunteers indicated they enjoyed or very much enjoyed their MHC experience and 91% of volunteers indicated they would consider teaching again next year. One medical student volunteer commented, “This was so fun and rewarding, and I am really glad I was able to be a part of it this year.”

FUTURE DIRECTIONS

- Data collection changes: implement online consent
- Teaching style changes: utilize more videos, games, role playing and small group activities
- Content changes: less time for introductions and classroom rules
- Future use of curriculum: Currently planning for teaching of a similar curriculum this fall, but uncertain if in-person teaching will be possible, due to the Coronavirus-19. If this is not an option, hopefully virtual teaching methods will be explored so that students will have a change to learn about these vitally important topics.

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Green schoolyards: a descriptive analysis of baseline data prior to a natural experiment

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Background

One third of US children are overweight or obese, which increases their risk for chronic disease later in life and negatively impacts their well-being during childhood.¹ A critical target for obesity prevention in children is increasing physical activity (PA). The physical environment is recognized as a key target for obesity prevention as studies have shown that spending time outside, and specifically in greenspace is associated with decreased sedentary time, increased moderate-to-vigorous activity,^{2,3} as well as improved cognitive functioning and social-emotional well-being.⁴ Also, school-age children obtain much of their PA during school recess, so addition of greenspace to the schoolyard may be a particularly important target in increasing PA among children.⁵

Hypothesis

The primary hypothesis of the schoolyard greening project is that greening will lead to increased student engagement, PA, and time spent outdoors, with implications for improving health. In this study, we measured PA levels, time spent outdoors, and patterns of play prior to schoolyard greening.

Methods

- Actigraph GT3X accelerometers and GPS devices were mounted on waistbands and used to measure the activity levels of and time spent outside by 55 4th grade students at Longfellow School
- Devices were worn by participating students at school for five consecutive days
- Student engagement and activity levels were observed in the schoolyard during recess using the System for Observing Play and Leisure Activity in Youth (SOPLAY), a systematic validated tool used to quantitatively evaluate levels of PA of individuals

Results

Table 1. Average MVPA, walking, and sedentary activity counts per day calculated using the four days of SOPLAY observation with the highest percent agreement between observers

| | 4th grade | | | Total |
|---------|-----------|-------------|---------------|-------|
| | MVPA (%) | Walking (%) | Sedentary (%) | |
| Females | 3 (11) | 14 (50) | 11 (39) | 28 |
| Males | 4 (18) | 10 (46) | 8 (36) | 22 |
| Total | 7 (14) | 24 (48) | 19 (38) | 50 |

SOPLAY:

- The largest category of activity was walking (48%)
- MVPA was the least observed activity (14%)
- Sedentary activity comprised 39% of female activity and 36% of male activity
- MVPA comprised 11% of female activity and 18% of male activity
- Much of the activity in the schoolyard (30%) was observed in area E—an area that contained the schoolyard garden and where the students played soccer and racing games
- Most male activities (36%) were also observed in area E
- Most female activities (32%) were observed in area C—an area of the schoolyard shaded by a large tree where students gathered to socialize



Figure 1. GPS-determined percent of activity (left) and density of activity (right) per schoolyard zone

ACCELEROMETRY AND GPS:

- Accelerometry data indicated an average of 10.1 (2.2, 18.6) steps per student per minute (sedentary activity is defined as 0-25 counts/15 second epoch, which translates to <100 counts/minute for our study)
- GPS data indicated the median time spent outdoors was 17 minutes
- GPS data revealed the area with the highest percentage of activity to be area D—an area of the schoolyard that contained several trees and where students played kickball
- GPS data revealed areas C and F to have the highest density of activity

Table 2. Average activity counts by area per day calculated using the four days of SOPLAY observation with the highest percent agreement between observers

| Zones | All Activities | | Male Activities | | Female Activities | |
|-------|---------------------|------------------------------|---------------------|-------------------------------|---------------------|---------------------------------|
| | Observed Activities | % of All Activities in Area* | Observed Activities | % of Male Activities in Area* | Observed Activities | % of Female Activities in Area* |
| A | 2 | 4% | 1 | 5% | 1 | 4% |
| B | 2 | 4% | 1 | 5% | 1 | 4% |
| C | 11 | 24% | 3 | 13% | 8 | 32% |
| D | 10 | 21% | 5 | 23% | 5 | 20% |
| E | 14 | 30% | 8 | 36% | 6 | 24% |
| F | 8 | 17% | 4 | 18% | 4 | 16% |

*This percentage was calculated by dividing the number of observed activities in the given area by the total number of observed activities in the category (e.g. All Activities, Male Activities, Female Activities)



Figure 2. Photos of Longfellow School schoolyard before and after construction of green schoolyard

Discussion

The school day is largely sedentary at Longfellow—there is plenty of room for increasing both PA and time outdoors. This could be impacted by greening through the planned construction of outdoor classrooms and sports fields that can be used for PE classes. Limitations that may have impacted these findings are that only 15 minutes were allotted for recess each day, and the data collection team was unable to ensure 24-hour wear of the accelerometers for 7 consecutive days, which is considered the standard for accelerometer measurements. SOPLAY findings suggest varying interest in engaging in PA and with specific schoolyard features, which may both be impacted by greening. Though there is some difference between the SOPLAY and GPS findings for percentage of activity in each schoolyard zone (perhaps due to the activity “snapshot” nature of the SOPLAY tool), areas C, D, E and F had the highest percentage of activities according to both GPS and SOPLAY data. It is interesting to note that as well as being the largest areas of the schoolyard, areas C and D were the sole areas with tree-cover on the schoolyard, and areas E and F also contained the schoolyard garden.

Future Work

Post-greening data collection for Longfellow has unfortunately been greatly impacted by the Covid-19 Pandemic. What we have learned through this preliminary data collection will inform our work with future cohorts involved in the Greening Schoolyards initiative.

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Acknowledgements

This project was funded by the Medical College of Wisconsin Institute for Health & Equity, the Advancing a Healthier Wisconsin Endowment, and the Medical College of Wisconsin Cancer Center. Special thanks to Drs. Swartz, Massey, Pearson, Stolley, Hyun, and Banerjee for their contributions. Thanks also to Longfellow Principal Ms. Cerda and Riya Mehta.

BACKGROUND

- Many pediatric medical practices now screen for social determinants of health (SDOH) and connect families with resources.
- Practice-based resource directories are being created, despite the availability of community-wide resource directories.
 - Unclear why efforts are being duplicated.

OBJECTIVE

- Determine caregivers', pediatric medical clinicians', and social workers' knowledge, use of, and recommendations regarding community-wide resource directories and community resources.

METHODS

- Semi-structured interviews in 7 outpatient clinics serving a majority Medicaid population.
- Caregivers recruited in-person before or after their clinic visit.
- Pediatric medical clinicians and social workers recruited via email.
- Interviews were recorded, transcribed, and analyzed inductively using grounded theory with NVivo 12 software.
- 34 interviews completed:
 - 20 with caregivers (10 in English/10 in Spanish).
 - 9 with pediatric medical clinicians.
 - 4 with social workers.

RESULTS

Table 1. Demographics of Caregivers, Pediatric Medical Clinicians, and Social Workers

| | Caregivers N=20 | Pediatric Medical Clinicians* & Social Workers N=13 |
|-----------------------|--------------------|---|
| | N (%) | N (%) |
| Gender | | |
| Female | 17 (85) | 11 (85) |
| Male | 3 (15) | 2 (15) |
| Race/ethnicity | | |
| African American | 10 (50) | 1 (8) |
| Hispanic | 10 (50) | 6 (46) |
| Caucasian | 0 (0) | 6 (46) |

* Includes pediatricians (MDs) and advanced practice providers (APPs)

Table 2. Community Resource Agencies Most Commonly Utilized (Caregivers) or Referred To (Medical Clinicians and Social Workers) (Note that these are reported by descending frequencies for each sector)

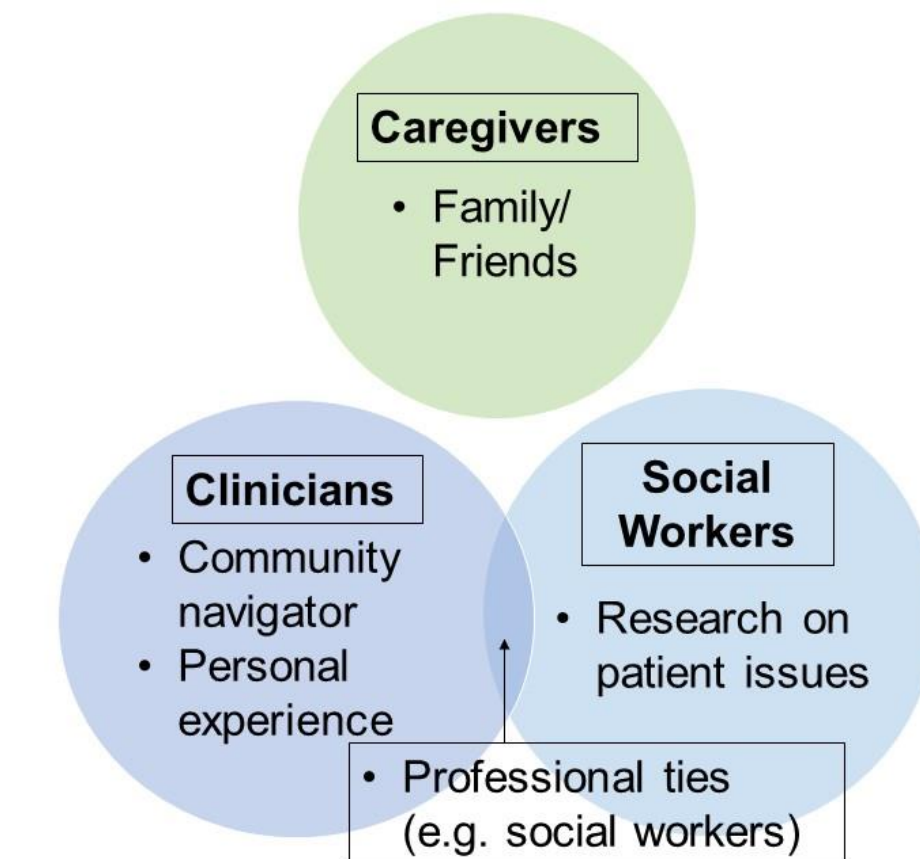
| Caregivers | Medical Clinicians | Social Workers |
|--|--|------------------------------------|
| Human Service Center | WIC (Women, Infants, Children Program) | Legal Services |
| WIC (Women, Infants, Children Program) | Birth to Three | Housing |
| Food Pantries | Schools: Individualized Educational Plans (IEPs) | Domestic Violence Services |
| Childcare | Childcare | Food Pantries |
| Schools | Transportation | Supplemental Security Income (SSI) |

Table 3. Caregivers' Recommendations To Improve Accessibility of Community Resource Directories to Families

- Available in different languages
- Schools – send home with children
- In stores (Human Service Center, corner stores, Walmart)
- Clinic waiting rooms
- Daycares
- TV or Radio
- Employment places/factories
- Social network pages (Facebook, Instagram)
- Billboards or Bus Stops

DISCUSSION

- High degree of consensus among participants that **trust** is key to navigating community resources:



- Overlapping themes emerged:
 - Regionalized patterns of agency utilization referrals (Table 2).
 - Focus on family self-determination.
 - Engaging experiences with trusted community resources offering cultural consonance.
 - Apathy regarding locus of responsibility for community stewardship.
- Few caregivers/clinicians knew community-wide resource directories existed; of those that had utilized them, varied opinions on usefulness.
- Families requested to take home a paper resource directory shown in the interview.
- Families recommended placement of directories to improve accessibility (Table 3).

CONCLUSION

- Trust is an essential element in interdisciplinary collaborations to improve access to resources.
- Further research needed regarding lack of overlap in trusted resources across stakeholder groups.

Background

Housing instability is defined by experiencing at least one of four circumstances in the past 12 months: two or more moves, inability to pay rent/mortgage/utilities, needing to stay with others due to difficulty paying bills, or a history of homelessness.

Children subjected to housing instability are more likely to have poorer physical health, exacerbated chronic conditions, behavioral problems, and increased hospitalizations. Children entering foster care also tend to have poorer mental and physical health in comparison to children who have never been in foster care. A study of housing needs of grandparent caregivers concluded that, "poverty and financial strain was found to be the overarching threat to securing and maintaining safe, affordable housing that is suitable for raising grandchildren."

Hypothesis

We hypothesized that kinship caregivers of youth enrolled in the Care4Kids (C4K) program were more likely to acknowledge having circumstances associated with housing instability and were more likely to accept housing resources.

Specific Aims

- Assess the rate of housing instability of families/caregivers of foster children enrolled in Care4Kids Foster Care Medical Home Program.
- Offer community resources (directed toward addressing housing needs) to caregivers identified as having housing instability.
- Compare rates of housing instability for different categories of caregivers.

Methods

- Triweekly review of the Care4Kids database to identify children enrolled in the C4K program who met criteria for study inclusion (removed from and placed in Milwaukee County).
- The study included children that entered foster care, changed placement, or re-enrolled in C4K between July and December 2019.
- Caregivers of identified children were interviewed regarding move frequency, inability to pay rent/mortgage/utilities, needing to stay with others due to difficulty paying bills, and history of homelessness in the past 12 months, as a part of the introduction to Care4Kids.
- Survey data was entered and stored into a RedCap database.
- Caregivers who screened positively for housing instability were offered a referral to the Children's Community Health Plan housing navigator.
- Caregivers who did not screen positively were also able to request and receive a housing referral.

Results

Figure 1: Children Enrolled in Study

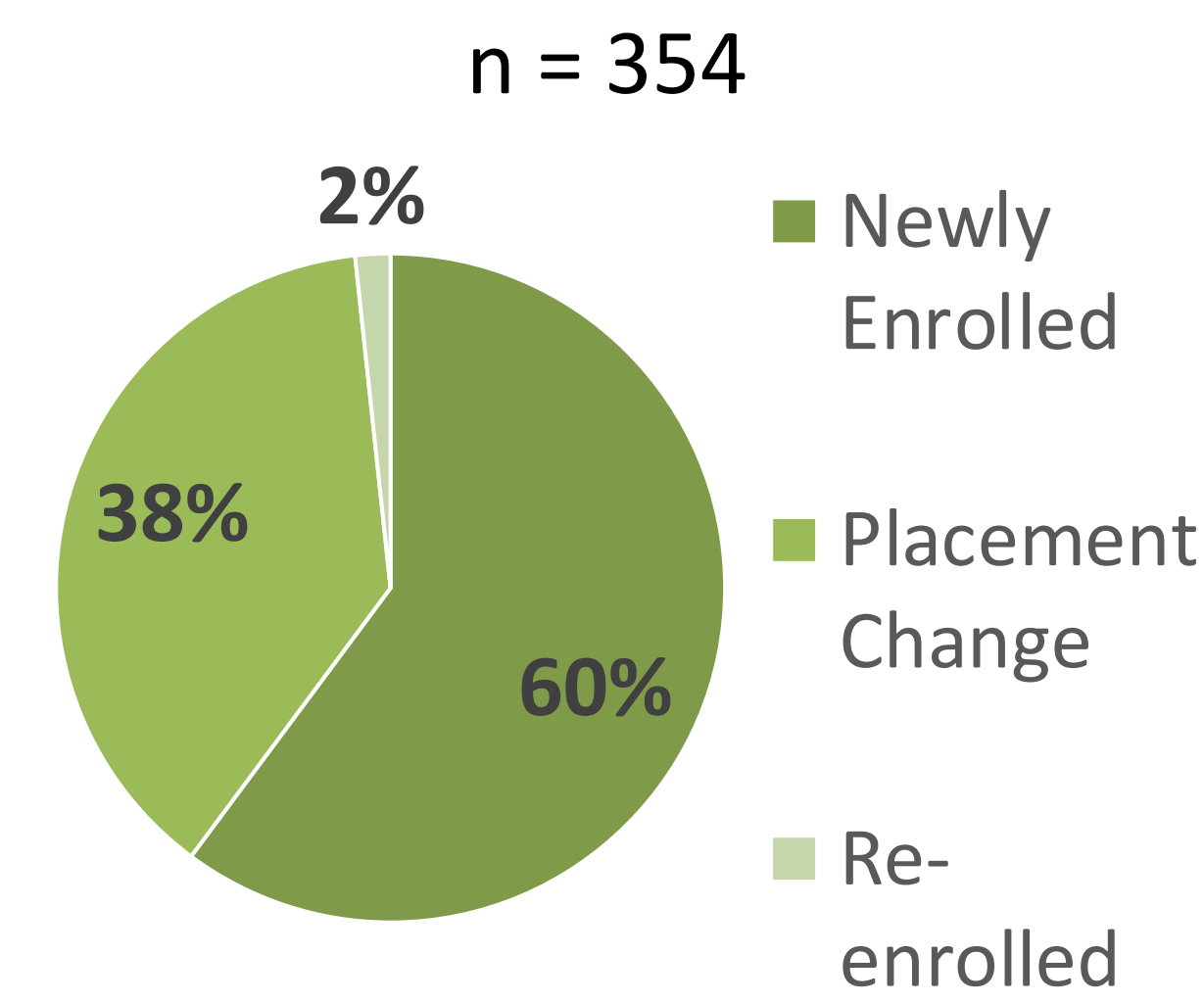


Figure 2: Caregivers Enrolled in Study

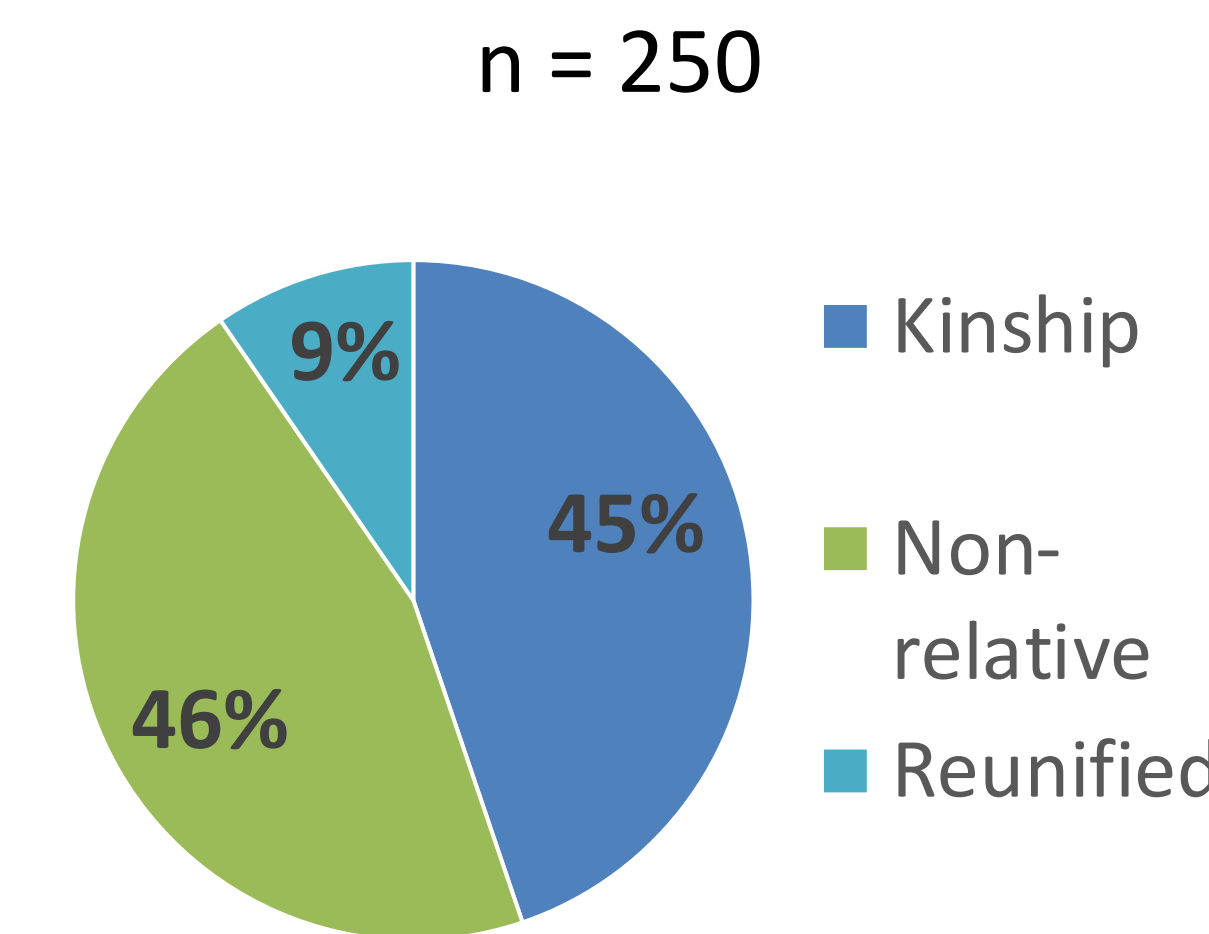


Figure 3: Caregivers Consenting to Housing Questions

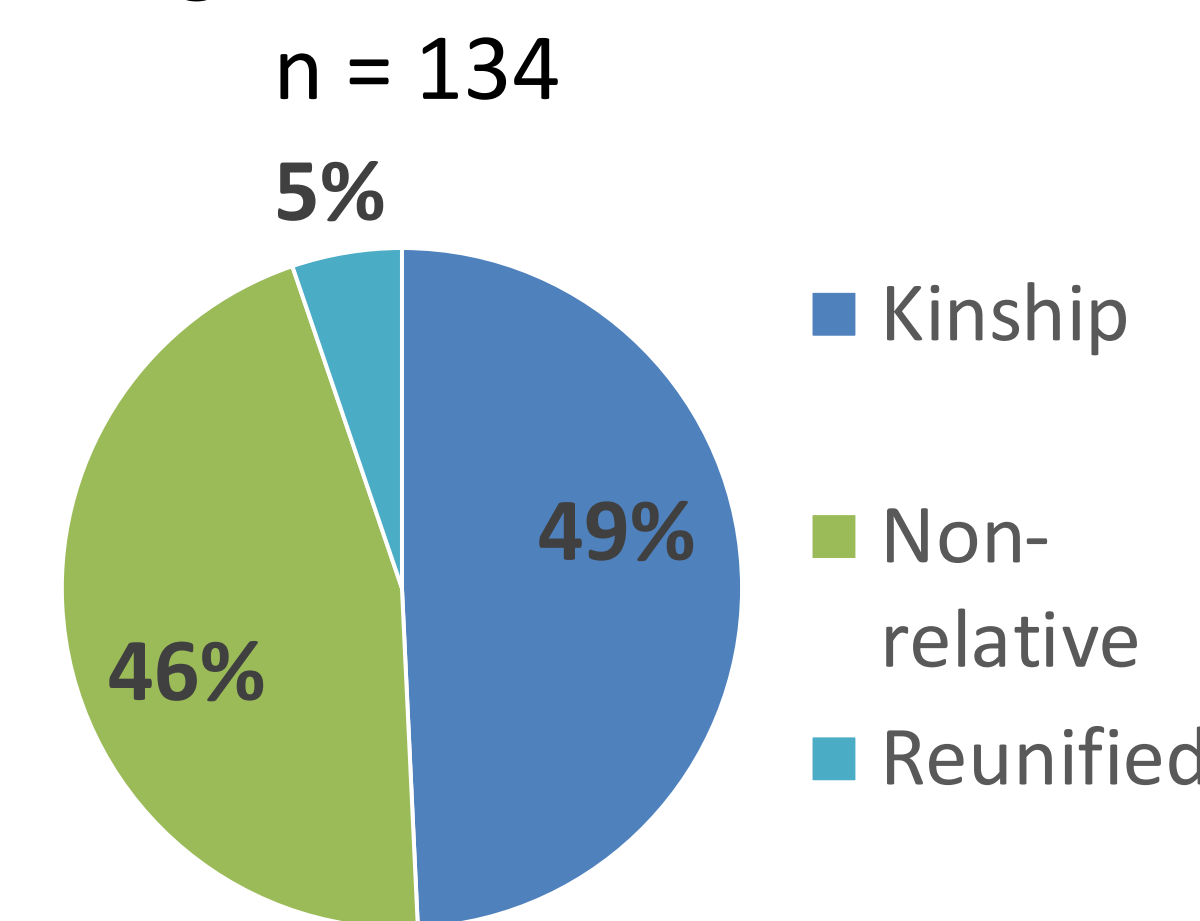


Figure 4: Housing Instability vs Caregiver Type

| Housing Instability Type | Number of Kinship Caregivers | Number of Non-relative Caregivers | Number of Reunified Caregivers | Total |
|---|------------------------------|-----------------------------------|--------------------------------|-------|
| Overall Housing Instability | 15 | 1 | 3 | 19 |
| Reason for Housing Instability*: | | | | |
| Two or more moves | 2 | 1 | 1 | 4 |
| Inability to pay bills | 13 | 0 | 3 | 16 |
| Stayed with others | 5 | 0 | 1 | 6 |
| History of homelessness | 2 | 0 | 0 | 2 |

*May have disclosed ≥1 reason for housing instability

Figure 6: Housing Instability and Housing Resources

| Caregiver Type | Housing Instability Identified | Housing Instability Identified; Housing Referral Declined | Housing Instability Identified; Housing Referral Requested | No Housing Instability Identified; Housing Referral Requested |
|----------------|--------------------------------|---|--|---|
| Kinship | 15 | 10 | 5 | 6 |
| Non-relative | 1 | 1 | 0 | 6 |
| Reunified | 3 | 0 | 3 | 0 |
| Total | 19 | 11 | 8 | 12 |

Discussion

From July to December 2019, 354 children met criteria for study enrollment (213 newly enrolled, 135 placement changes, 6 re-enrolled) (**Fig. 1**). 250 caregivers were enrolled in the study (**Fig. 2**). 134 caregivers consented to answering housing questions (**Fig. 3**). Survey response rate was 54%. There were 47 homes where multiple eligible children resided. 66/134 (49%) consenting caregivers were kinship caregivers, 61 (46%) were non-relative caregivers, and 7 (5%) were reunified caregivers (**Fig. 3**). 15 kinship, 1 non-relative and 3 reunified caregivers screened positively for housing instability, with inability to pay bills being the most common reason (**Fig. 4**). Of these, 5 kinship and 3 reunified caregivers desired referrals to housing resources. 12 caregivers (6 kinship and 6 non-relative) did not screen positively for housing instability but desired a housing referral. 23% (31/134) of respondents were found to have a possible housing need. 19 caregivers confirmed housing instability and 12 caregivers requested a housing referral without disclosing housing instability. (**Fig. 5**).

Conclusion

Unmet housing needs were identified in 23% of caregivers surveyed. The most common type of housing instability was inability to pay bills (rent/mortgage/utilities). Housing instability was most common for kinship caregivers but was also significant for reunified caregivers. Since more caregivers requesting housing referral had a negative screen for housing instability, the screening tool may not be the optimal strategy for identifying those families truly needing support.

Next Steps

- Improve the housing instability screening process (working with care coordination team and possible focus group with caregivers).
- Analyze claims data to assess whether there is an association between housing instability and unplanned health care utilization (urgent care visits, ER visits, and hospitalizations) for foster children in the study.

Acknowledgments

- Research approved by Children's Wisconsin IRB.
- Funding from the Wisconsin Medical Society Foundation.
- Research support from Dr. Peter Havens and Kelsey Porada.
- Enrollment support from Care4Kids leadership (Heather Swider, Jacqueline Johnson, Jessica Cabrera, and Emily DeLeo).
- Statistical support from MCW Dept. of Pediatrics Section of Quantitative Health Sciences (Dr. Amy Pan and Melodee Liegl).

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