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Patterns of participation in summer programming among United States' elementary children from low-income urban households: Results from the project SWEAT study

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ABSTRACT

Food insecurity increases among marginalized children during the summer when school is out of session. Summer programming that offers access to healthy meals and snacks may reduce the risk. There is a national call in the US for more research to assure equitable access to summer programming. The objective of this prospective observational study was to characterize patterns of participation in summer programming among elementary children from low-income urban neighborhoods of metropolitan[Blinded]. Summer programming was broadly defined (e.g., church, school, recreation center, community center). Caregivers(n = 100) received weekly text messages via TextIt during the summer (Jun-Aug 2017). They were asked: "How many days this week did [ChildName] attend a summer program? Please respond with a number from 0 to 5, where 0 – no days, 2 – 2 days, etc." Weekly counts were summed.

Stepwise logistic and linear regression models were conducted to examine differences in patterns of attendance according to key sociodemographic characteristics. Mean age was 7.03 ± 0.23. 52 % identified as female, 70 % were low-income, and 80.0 % identified as Black. 51 % attended summer programming at least once; 49 % never attended. Those who attended at least once vs. not at all were more likely to be male($p < 0.01$); 62.75 % males vs. 37.25 % females attended summer programming at least once, whereas 67.35 % females compared to 32.65 % males never attended.

Overall mean attendance was 10.40 ± 1.43 days(out of 50). Mean + SE attendance was lower for females (7.52 + 1.76) vs. males (13.52 + 2.21)($p < 0.05$), and non-Black (4.30 + 1.97) vs. Black (11.93 + 1.67)($p = 0.01$) children. Future research is needed to understand barriers to participation in summer programming.

1. Introduction

Food insecurity is defined as "the limited or uncertain availability of safe and nutritionally adequate foods," (Measurement. USDA Economic Research Service; 202Accessed February 10, 2023) and represents a longstanding public health crisis in the United States (US) (Gundersen, 2013). This is particularly true among households with children (Coleman-Jensen et al., 2022).. The COVID-19 pandemic magnified the problem due to unemployment (Niles et al., 2020) and inconsistent access to school meals due to extended school closures (McLoughlin et al., 2020; Parekh et al., 2021; Antwi et al., 2021) Today, 9.3 million US children experience some degree of food insecurity, and 521,000 experience the most severe form (i.e., very low food security = disruptions in daily eating patterns and reduced food intake) (Coleman-Jensen et al., 2022).

Poverty is a key driver of food insecurity (Facts about Poverty and Hunger in America. Feeding America Accessed February 12, 2023). Black and Hispanic children are disproportionately affected by poverty due to systemic racism and discrimination, and thus are significantly more likely to experience food insecurity than White children (Children Living in Households That Experienced Food Insecurity: United States, 2022; Odoms-Young and Bruce, 2018). White children have not experienced the same social disadvantages as Black and Hispanic children, however there are still many White children suffering from poverty and

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food insecurity (Thomas and Fry, 2020).

Children experiencing food insecurity have worse dietary outcomes than their food secure counterparts (Jun et al., 2021). Child food insecurity has been linked with reduced vegetable and fiber intake, increased intake of added sugars and beverages, and higher energy intake (Jun et al., 2021; Eicher-Miller and Zhao, 2018; Eicher-Miller and Fialkowski, 2020; Moore and Thompson, 2015). Hidden hunger (i.e., micronutrient deficiencies, including vitamin D, magnesium, and calcium) has also been observed in food insecure vs food secure children (Jun et al., 2021). Food insecurity also places a child at increased risk for poor health outcomes (Gundersen, 2015). Children who experience food insecurity are more likely to be affected by overweight or obesity (Tester et al., 2020; Larson and Story, 2011; Casey et al., 2006; Eisenmann et al., 2011). While it is unclear whether or not a causal relationship exists between food insecurity and obesity, the research consistently demonstrates a strong link between the two health risk factors (Tester et al., 2020). Regardless, childhood obesity increases the risk of cardiometabolic abnormalities (e.g., hypertension, dysglycemia) during childhood and into adulthood (Skinner et al., 2015; Daniels et al., 2005). Thus, children exposed to food insecurity are at a marked disadvantage with regards to their physical (cardiometabolic) heath. Beyond causing physical health problems, children who are food insecure are significantly more likely to experience negative mental health outcomes, such as anxiety, stress, and depression (Shankar et al., 2017). This occurs even at low levels of food insecurity (Shankar et al., 2017; McLaughlin et al., 2012; Poole-Di Salvo et al., 2016).

Children from low-income households who rely on school-based child nutrition programs (i.e., United States Department of Agriculture or USDA's National School Lunch Program and National School Breakfast Program) are at risk for food insecurity (Soldavini and Ammerman, 2021), poor diet quality (Lee et al., 2019; Hopkins et al., 2021), and accelerated weight gain (von Hippel et al., 2007; Baranowski et al., 2014; Moreno et al., 2015; Tanskey et al., 2019) during the summertime when school is out of session. USDA's Summer Food Service Program (SFSP) is designed with specificity to address the summertime window of nutritional risk (Hopkins and Gunther, 2015). A growing body of literature demonstrate that nutritional health is protected when children have summertime access to food and nutrition resources like the SFSP. The SFSP has demonstrated effectiveness on food security (Nord and Romig, 2007; Miller, 2016) dietary quality (White and Maroto, 2016), and BMI (Hopkins et al., 2019; Kilanowski and Gordon, 2015; Evans et al., 2018). Unfortunately, relative to its companion programs (NSLP and NSBP), federally derived data indicate that rates of participation in the SFSP lag (Hayes et al., 2022). In summer 2021, 30.4 out of every 100 children received a summer lunch who received a lunch during the 2020–2021 school year (Strengthening the Child Nutritional Programs, 2022). Outside of the federally subsidized SFSP, summer day camps and programs exist, however cost is a major barrier to participation (Brazendale et al., 2022). Notably, caregivers express interest in free summer programming for their children (Brazendale et al., 2022).

In a recent paper pressing for increased equity in the USDA child nutrition programs, there is a specific call for research on improving equitable access to the SFSP (Cohen et al., 2023). To achieve this goal, it will be imperative to understand which children socio-demographically are most and least likely to attend summer programming. Unfortunately, there are currently no such published data in the peer-reviewed or grey literature. The objective of this study was to characterize the patterns of participation in summer programming among children from low-income urban neighborhoods of metropolitan Columbus Ohio.

2. Methods

2.1. Study design

Project SWEAT was a prospective observational study implemented at two elementary schools in low-income, urban neighborhoods of Columbus Ohio. Data were obtained from children at the end of the school year (June 2017) and on a weekly basis throughout the course of the summer months (June-Aug 2017). More information regarding the Project SWEAT study design has been published elsewhere (Hopkins et al., 2018).

2.2. Participants, recruitment, and data collection

At the end of the school year, all children in pre-K through fifth grade were invited to participate through permission of their caregivers. Indirect and direct recruitment methods were employed. For indirect recruitment, an informational sheet describing the study and a demographic survey was sent home with each child. The demographic survey included a question regarding caregiver's intention to send their child(ren) to summer programming [Yes or No] and if yes, their willingness to receive weekly text messages during the summer regarding child(ren)'s attendance in summer programming [Yes or No]. For direct recruitment, study staff attended school events and were present at child drop-off and pick-up times to speak with caregivers about the study directly. Return of a completed demographic survey indicated caregiver consent, as well as caregiver permission to enroll their child or children in the study. Specifically, the last line on the form stated: "By returning the attached demographic survey, you are providing consent for your own participation and permission for your child's participation in this research study, as outlined above." Child assent was obtained at the time of baseline data collection. Caregivers (consent, permission) and children (assent) were informed at the time of study enrollment that they had the right to refuse to participate in the study at any time without penalty.

All data were collected by trained data collectors, who consisted of graduate and undergraduate students studying nutrition, public health, or related fields. Data collectors underwent a 4-day training, which included learning sessions and role-playing the protocols. Data collection occurred at the respective schools during school day hours.

The study was approved by The Ohio State University Social and Behavioral Institutional Review Board.

2.3. Outcomes

Questions on the caregiver-completed demographic survey pertained to: 1) the child(ren)'s age (date of birth), gender (male or female), and race (Black/African American, White/Caucasian, Asian, Alaska Native/American Indian, Hawaiian/Pacific Islander, Other); 2) number of adults and number of children living in the household; 3) annual household income; and 4) food security status using the USDA's 6-item short form screener reflecting on the past 12 months (United States Department of Agriculture). Demographic information were calculated or coded as follows. Child age in days (years) was ascertained by date of birth. Gender was coded as male = 0 and female = 1. For race, participants were classified as Black if their caregiver reported the child as being Black/African American or Black/African American and another race (n = 80). All others (White/Caucasian (n = 13), Asian (n = 3), Alaska Native/American Indian (n = 1), Hawaiian/Pacific Islander (n = 0), Other (n = 3)) were classified as non-Black. Race was coded as non-Black = 0 and Black = 1. For ethnicity, n = 97 identified as non-Hispanic and n = 3 identified as Hispanic; data were not coded and analyzed according to ethnicity due to the small Hispanic sample size. For household income, a binomial variable (non-low-income = 0; low-income = 1) was created. Annual household income data were collected categorically: a) < 10,000; b) $10,001–20,000; c) $20,001–30,000; d) $30,001–40,000; e) $40,001–50,000; f) $50,001–60,000; g) $60,001–80,000; h) >$80,000 (Hopkins et al., 2021). Based on responses to the categorical annual household income question, participants were assigned an income-level based on the mid-point within that income range. For example, if a participant responded that their annual household income was between $10,001 and $20,000, they were

assigned an income level of $15,000. This annual household income level was compared to the national poverty guidelines (United States Department of Health and Human Services. U.S, 2017), and based on the number of individuals living in the household, participants were classified as low-income or non-low-income. A household food security score was calculated per USDA guidelines where affirmative responses (i.e., Sometimes True, Often True, Yes) received 1 point and non-affirmative responses (i.e., Not True, Don't Know, No) received 0 points. Based on summed food security scores, household food security categories were created (High or marginal food security: 0–1; Low food security: 2 = 4; Very low food security: 5–6) according to USDA guidelines and coded for analyses (High or marginal food security = 0; Low food security = 1; Very low food security = 2) (United States Department of Agriculture).

Child summer programming attendance data were collected using the TextIt (Pottier et al., 2014) text messaging platform. Summer programming was broadly defined to caregivers and could include any type of programming during the summer months at a church, school, recreation center, or community center. On Friday afternoon of each week for the 10-week summer, caregivers received a text message that stated: "Hello from Project SWEAT! How many days this week did [Child Name] attend a summer program? Please respond with a number from 0 to 5, where 0 – no days, 2 – 2 days, etc." Non-responders received a follow-up text message on Sunday, followed by a phone call on Monday. Weekly counts from responses to text messages sent from the TextIt platform or follow-up phone calls were summed. For n = 9 participants, caregivers reported that they would not be sending their child to structured programming, so they did not want to receive weekly text messages. For these participants, attendance was recorded as 0 for the summer.

2.4. Data analysis

Attender status (attender [≥1 day] and non-attender [0 days]) and mean attendance (10 weeks × 5 days/week = 50 days total) were explored. Stepwise regression models were conducted to determine if there were significant differences in attender status (logistic) and mean attendance (linear) according to key sociodemographic characteristics. Significance was set at $p < 0.05$.

3. Results

Attendance data were collected from 89 % of participants of the Project SWEAT Main Study sample (n = 100 of 113). Mean age of participants was 7.03 ± 0.23 years. Fifty two percent (n = 52) were female, 80.00 % (n = 80) identified as Black, 70.10 % (n = 68) were low-income, and 30.00 % (n = 30) had low or very low food security. See Table 1.

Fifty-one percent (n = 51) of participants were classified as attenders, while 49.00 % (n = 49) were classified as non-attenders. Attenders were significantly more likely to be male 62.75 % (n = 32) vs. female 37.25 % (n = 19) ($p < 0.01$). Attender status did not vary significantly by age, race, income, or food security status. See Table 1.

Mean attendance was 10.40 ± 1.43 days (out of 50 days). Mean attendance was significantly lower for participants who identified as female versus male (7.52 ± 1.76 vs. 13.52 ± 2.21, $p < 0.05$) and non-Black versus Black (4.30 ± 1.97 vs. 11.93 ± 1.67, $p = 0.01$). There were no statistically significant differences in mean attendance according to food security status or income. See Table 2.

4. Discussion

Children from low-income households who rely on the school-based federal foods nutrition programs are nutritionally vulnerable during periods of time when school is closed or out of session (Nord and Romig, 2007; Huang et al., 2015). Black children are disproportionately affected by poverty as a result of systemic racism (Odoms-Young and Bruce, 2018) and thus are at especially high risk for poor nutritional health (i.e. food insecurity (Soldavini and Ammerman, 2021), poor diet quality (Lee et al., 2019; Hopkins et al., 2021), accelerated weight gain (von Hippel et al., 2007; Baranowski et al., 2014; Tanskey et al., 2019) when school is not in session. The COVID-19 pandemic brought this longstanding public health crisis to the forefront (McLoughlin et al., 2020; Tester et al., 2020)(p202), (Rundle et al., 2020). Now more than ever, there is urgency for solutions to increasing equitable access to federal food and nutrition assistance programs such as the SFSP (Cohen et al., 2023). Studies on the sociodemographic patterns of participation in summer programming among racially minoritized children are needed to address this gap. Results from the current study demonstrated that many children do not engage in summer programming, and among those who do, the attendance rate is low. Boys compared to girls were more likely to

Table 1
Sociodemographic Characteristics of Children Participating in the Main Study of Project Summer Weight Environmental Assessment Trial or SWEAT (June-August 2017; Columbus, Ohio) (n = 100) by Summer Programming Attender Status[A,B].

Variable	All	Attender Status	
		Attenders	Non-Attenders
Age (years), Mean ± SE (n = 97)	7.03 ± 0.23	7.34 ± 0.34	6.70 ± 0.29
Gender, % (n) (n = 100)[C]	48.00 (48)	62.75 (32)	32.65 (16)
Male	52.00	37.25	67.35
Female	(52)	(19)	(33)
Race, % (n) (n = 100)[D]	80.00 (80)	82.35 (42)	77.55 (38)
Black	20.00	17.65	22.45
Non-Black	(20)	(9)	(11)
Income, % (n) (n = 97)[E]	70.10 (68)	68.00 (34)	72.34 (34)
Low-Income	29.90	32.00	27.66
Non-Low-Income	(29)	(16)	(13)
Household Food Security Status,	20.00 (20)	17.65 (9)	22.45 (11)
% (n) (n = 100)[F]	10.00	13.73	6.12
Very Low Food Security	(10)70.00	(7)68.63	(3)71.43
Low Food Security	(70)	(35)	(35)
Marginal or High Food Security			

Bold font indicates significance.
[A]Attender status: Attenders were individuals who reported attending ≥ 1 day summer programming and non-attenders reported attending 0 days of summer programming.
[B]Stepwise logistic regression model was used to determine differences in sociodemographic characteristics.
[C]Gender alone was significant in the model ($p < 0.01$) with the overall model being $p < 0.01$.
[D]Participants were classified as either Black or non-Black. Participants were classified as Black if their caregiver reported the child as being Black/African American or Black/African American and another race. All others (White/Caucasian (n = 13), Asian (n = 3), Alaska Native/American Indian (n = 1), Hawaiian/Pacific Islander (n = 0), Other (n = 3)) were classified as non-Black.
[E]A binomial variable (non-low-income = 0; low-income = 1) was created. Annual household income data were collected categorically: a) < 10,000; b) $10,001–20,000; c) $20,001–30,000; d) $30,001–40,000; e) $40,001–50,000; f) $50,001–60,000; g) $60,001–80,000; h) >$80,000. Based on responses to the categorical annual household income question, participants were assigned an income-level based on the mid-point within that income range. For example, if a participant responded that their annual household income was between $10,001 and $20,000, they were assigned an income level of $15,000. This annual household income level was compared to the national poverty guidelines (United States Department of Health and Human Services. U.S, 2017), and based on the number of individuals living in the household, participants were classified as low-income or non-low-income.
[F]A household food security score was calculated per USDA guidelines where affirmative responses (e.g., Sometimes True, Often True, Yes) received 1 point. Based on food security scores, household food security categories were created (high or marginal food security: 0–1; Low food security: 2 = 4; Very low food security: 5–6) based on USDA guidelines and coded for analyses (High or marginal food security = 0, Low food security = 1, Very low food security = 2). (Casey et al., 2006).

Table 2
Mean ± SE Summer Programming Attendance of Children Participating in the Main Study of Project Summer Weight Environmental Assessment Trial or SWEAT (June-August 2017; Columbus, Ohio) (n = 100) by Sociodemographic Characteristics[A].

Variable	Mean ± SE
Gender (n = 100)[B]	
Male	13.52 ± 2.21
Female	7.52 ± 1.76
Race (n = 100)[B,C]	11.93 ± 1.67
Black	4.30 ± 1.97
Non-Black	
Income (n = 97)[D]	11.55 ± 2.41
Low-Income	9.87 ± 1.79
Non-Low-Income	
Household Food Security Status (n = 100)[E]	5.70 ± 2.85
Very Low Food Security	19.00 ± 6.15
Low Food Security	10.51 ± 1.61
Marginal or High Food Security	

SE = Standard Error.
Bold font indicates significance.
[A]Stepwise linear regression model was used to determine differences in sociodemographic characteristics.
[B]Gender ($p < 0.05$) and race ($p = 0.01$) were each significant in the model with the overall model being $p < 0.01$.
[C]Participants were classified as either Black or non-Black. Participants were classified as Black if their caregiver reported the child as being Black/African American or Black/African American and another race. All others (White/Caucasian (n = 13), Asian (n = 3), Alaska Native/American Indian (n = 1), Hawaiian/Pacific Islander (n = 0), Other (n = 3)) were classified as non-Black.
[D]A binomial variable (non-low-income = 0; low-income = 1) was created. Annual household income data were collected categorically: a) < 10,000; b) $10,001–20,000; c) $20,001–30,000; d) $30,001–40,000; e) $40,001–50,000; f) $50,001–60,000; g) $60,001–80,000; h) >$80,000. Based on responses to the categorical annual household income question, participants were assigned an income-level based on the mid-point within that income range. For example, if a participant responded that their annual household income was between $10,001 and $20,000, they were assigned an income level of $15,000. This annual household income level was compared to the national poverty guidelines (United States Department of Health and Human Services. U.S, 2017), and based on the number of individuals living in the household, participants were classified as low-income or non-low-income.
[E]A household food security score was calculated per USDA guidelines where affirmative responses (e.g., Sometimes True, Often True, Yes) received 1 point. Based on food security scores, household food security categories were created (High or marginal food security: 0–1; Low food security: 2 = 4; Very low food security: 5–6) based on USDA guidelines and coded for analyses (High or marginal food security = 0; Low food security = 1; Very low food security = 2). (United States Department of Agriculture).

engage. Further, Black vs non-Black children had a higher mean attendance. These findings will be critical to informing future efforts to increase the equitable access and impact of the SFSP and other summer programming for children, and reverse trends in health disparities among systemically marginalized individuals.

Participants in the current study were from low-income households and identified primarily as non-Hispanic Black. Reported engagement in summer programming was low. Around half of participants never attended programming, and among those who did, attendance was low (10 out of 50 days = 20 % attendance rate). Accelerated weight gain during the summer months has been observed primarily among minoritized children (von Hippel et al., 2007). According to the Structured Days Hypothesis (SDH), it is the loss of exposure to daily routines imposed by school attendance (e.g., set waking time, school meals, planned physical activity (Bohnert et al., 2014)) that is thought to explain the accelerated weight gain during the summer when school is out of session (Brazendale et al., 2017; Evans et al., 2020). Thus, it is possible that the elevated rates of weight gain observed among Black children are due to low engagement in summer programming. And while a threshold for attendance level has not been established with regards to summer programming and accelerated weight gain there are data indicating that children who attend summer *learning* programming at a rate of approximately 75 % experience better academic outcomes (Voluntary Summer Learning Programs for Elementary School Students Benefit Those with High Levels of Attendance, 2016). Regardless, it will be important for future research to understand the barriers to participation in summer programming, particularly through a social determinants of health lens (e.g., racism, discrimination, income, food access).

In this study, boys compared to girls were more likely to engage in summer programming. This finding may explain the broader research observation that girls are more likely than boys to gain weight during the summertime (Rodriguez et al., 2014). In a longitudinal study of Hispanic school aged children from low-income households, girls were more likely than boys to experience gains in body weight, specifically fat mass, during the summertime (Rodriguez et al., 2014). Gender is as a well-established social determinant of health (World Health Organization, 2010); thus it is plausible that differences in gender expectations due to socio-cultural influences (Kågesten et al., 2016) may be driving this gender inequity – e.g., girls are encouraged by caregivers to stay home during the summer to assist with domestic responsibilities such as caring for younger children in the household, whereas boys are encouraged to leave home and go to programming. Regardless, there is need to study this phenomenon more deeply, in a larger, representative sample to better understand potential gender-specific trends (inequities), and the underlying causes.

There was no significant difference in attender status by race, however mean attendance was substantially lower for non-Black compared to Black participants. This was an unexpected finding and could be due to the small number of non-Black participants (20 % of total sample). On the other hand, it is possible that this finding may relate to the setting in which the study was conducted - i.e., proximity and offerings in geographic proximity to the study location. It is also plausible that there are unique barriers to participation for non-Hispanic White children that are not fully understood. It will be important for future research to uncover the barriers to participation in order to design and deliver responsive and tailored summer programming.

Children experiencing the highest degree of food insecurity attended summer programming the least frequently; however this finding was not statistically significant. Two of the most common reported barriers to participation are lack of transportation to congregate settings where meals are served and lack of childcare for younger siblings so parents or guardians can arrange for school-aged children to attend summer programming (Strengthening the Child Nutritional Programs, 2022). Due to the co-occurrence of food insecurity and poverty (Pereira and Oliveira, 2020), children in households experiencing higher degrees of food insecurity are also likely to experience greater financial constraints. Thus, it is possible that the reported barriers of lack of transportation and need for childcare for younger children in the home are more acute for children in highly food insecure home environments, thereby leading to a lower likelihood of engagement in summer programming. Another barrier relates to the eligibility threshold for federal foods programs (Strengthening the Child Nutritional Programs, 2022). Currently, USDA SFSP summer meals sites must be in the attendance area of a school where at least 50 % of the children are eligible for free or reduced price school meals (Too Many Hurdles: Barriers to Receiving SNAP Put Children's Health at Risk, 2011). Lowering this area eligibility threshold or eliminating it altogether – as occurred as a flexibility during the COVID-19 pandemic (Strengthening the Child Nutritional Programs, 2022) – could allow more providers to offer programs and provide meals to more children in need because large numbers of needy students live in areas where this threshold is not met (Strengthening the Child Nutritional Programs, 2022).

There are multiple strengths to the current study. The first being the novelty of the findings – now more than ever there is urgent need to identify the children who are least likely to engage in summertime programming to develop summertime interventions targeted to the most

marginalized children. The method utilized to gather information on children's attendance is another study strength. Specifically, caregivers were engaged on a real-time weekly basis via text messaging through the duration of the summer. This increases the validity of the findings (i.e., reduces the risk of recall bias (Shimoni et al., 2020) and social desirability bias (Drake et al., 2020)), and suggests text messaging is a feasible approach for engaging caregivers of school-aged children during the summertime. The main study limitation was the lack of detail on the type of summer programming children attended in terms of duration, meals/snacks, and activities offered. Another limitation to this study was the relatively small number of non-Black and Hispanic participants. Finally, there is the possibility of selection bias – a threat to both internal and external validity – whereby we recruited individuals who aren't reflective of the target population.

It will be important for future research to gather detail on the type and quality of programming because it may elucidate what is best able to protect children against summer weight gain. As the importance of structured summer programming becomes more evident, this information will be useful to help develop effective summertime programs for children. Further research in these populations is necessary to understand how rates of summertime programming participation may differ by race and ethnicity. Future research should include randomized control trials to conclusively understand the differences in seasonal changes in weight and health status in program attenders vs non-attenders. In addition, mixed methods community-based participatory research may be critical to understand why differences in overall and mean attendance in gender and race were observed. Community partnerships, in conjunction with further research, may offer unique insight to solutions for improving summer program attendance, particularly for female and minoritized children.

CRediT authorship contribution statement

Laura Hopkins: Conceptualization, Methodology, Software, Formal analysis, Investigation, Writing – original draft, Supervision. **Heather Schier:** Writing – original draft. **Leah May:** Data curation, Writing – original draft. **Miranda Westrick:** Data curation, Writing – original draft. **Devin O'Piela:** Writing – original draft. **Bernadette Mazurek Melnyk:** Writing – review & editing. **Laureen Smith:** Writing – review & editing. **Carolyn Gunther:** Conceptualization, Methodology, Investigation, Writing – original draft, Visualization, Project administration, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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