



Health status and missed care among youth in care in British Columbia, Canada: A population study

James X. Wang^{a,*}, Sheila K. Marshall^{a,b}, Colleen Poon^c, Annie Smith^c

^a Division of Adolescent Health and Medicine, Department of Pediatrics, University of British Columbia, 948 West 28th Avenue, Room V2-203, Vancouver, BC V5Z 4H4, Canada

^b School of Social Work, University of British Columbia, 2080 West Mall, Vancouver, BC V6T 1Z2, Canada

^c McCreary Centre Society, 3552 East Hastings Street, Vancouver, BC V5K 2A7, Canada

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ABSTRACT

Purpose: Youth in care (YIC) are a marginalized population with high health care needs and barriers to access, resulting in lifelong health disparities. This study examines the health of Canadian YIC and their engagement with the Canadian health care system on a population level.

Methods: Data were retrieved from the 2018 British Columbia Adolescent Health Survey, a cross-sectional population survey of Grade 7–12 students (ages 12–19 years) in British Columbia, Canada ($n = 38,015$). Primary outcomes were self-rated general health and mental health, missed medical care, and missed mental health care among YIC. Secondary outcomes included health care access and gender differences. Multivariate analyses adjusted for age, gender, and food insecurity.

Results: YIC represented 1.9 % of the weighted sample population. Compared to non-YIC, YIC accessed health care more frequently from mental health professionals and youth-focused clinics and less frequently from family physicians. YIC reported worse general health (AOR 1.81 [99 % CI 1.40–2.34]) and mental health (AOR 1.81 [99 % CI 1.42–2.32]) than non-YIC. Adjusted for health status, YIC experienced more missed medical care (AOR 1.96 [99 % CI 1.46–2.62]) but comparable missed mental health care to non-YIC. Significant barriers for YIC included negative health care experiences and transportation. Among YIC, female and non-binary genders also had increased risk for worse health and missed care compared to males.

Conclusions: YIC in Canada have inequitably unmet health care needs. Many complex factors contribute to this disparity and its correlation with out-of-home care. Further action is needed to reduce health care barriers for YIC.

1. Introduction

More than 59,000 (8.2 per 1,000) Canadian children and youth live in out-of-home care, which includes over 6,200 (6.8 per 1,000) in the province of British Columbia (Saint-Girons, Trocmé, & Esposito, 2019). The number of youth in care (YIC) is not well estimated, partly due to variations in definitions and reporting among provincial jurisdictions. YIC in British Columbia may live in foster care, kinship care, group homes, or supervised independent living, also known as “Youth Agreements,” until the age of majority of 19 years. The province of British Columbia has a statutory commitment to the health of YIC and indicates that “necessary health care [...] should be provided without delay”

(Child, Family and Community Service Act, 1996).

The Canadian Paediatric Society and the American Academy of Pediatrics have recognized the health disparities and barriers faced by children and youth in care and recommended facilitating their health care access to meet their greater health care needs (American Academy of Pediatrics, 2005; Ponti, 2008). Few studies have examined the health of YIC on a population level and none to our knowledge has investigated reasons for missed care from a youth perspective. In addition, health literature involving Canadian YIC is particularly scarce. Canada has a single-payer health care system with universal coverage for most services, which is more similar to the UK than the USA. Previous studies in the American privatized health care system contained health insurance

* Corresponding author at: Division of Adolescent Health and Medicine, Department of Pediatrics, University of British Columbia, 948 West 28th Avenue, Room V2-203, Vancouver, BC V5Z 4H4, Canada.

E-mail address: jameswang@alumni.ubc.ca (J.X. Wang).

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differences as an inherent confounder. Furthermore, previous large-scale studies on the health of YIC provided important findings but were frequently limited by the lack of a direct comparison group within the same sample (Heneghan, Stein, & Hurlburt, 2015; Leslie, James, & Monn, 2010).

The accumulation of health problems among YIC not only contributes to the overall burden of disease and rising health care costs, but also reflects underlying societal health inequities. Children and youth who have experienced out-of-home care have a significantly higher prevalence of chronic physical and mental health problems than children and youth not in care, including anxiety, depression, attention deficit hyperactivity disorder, learning and developmental delays, vision and hearing impairments, dental caries, asthma, obesity, and sexually transmitted infections (Ahrens, Richardson, & Courtney, 2010; Bronsard, Alessandrini, & Fond, 2016; Deutsch & Fortin, 2015; Ponti, 2008). Poor physical and mental health are likely to persist when out-of-home care ends, resulting in higher frequencies of chronic health conditions in adulthood, such as mood disorders, asthma, obesity, and hypertension (Survey (NSCAW), 2022). These health disparities are the product of a variety of intrinsic and extrinsic barriers encountered by YIC, both preceding their entry into care as well as during or soon after their experience in care.

Barriers to health care may result in a health care need being entirely unmet, incompletely met, or significantly delayed, which are altogether defined as missed care. Early studies on missed care focused on adolescents and other pediatric groups, such as children living in poverty and children with special needs (Guendelman, Angulo, & Oman, 2005; Klein, Wilson, & McNulty, 1999; Margolis, Mayer, & Clark, 2011; Wilson & Klein, 2000). Missed care can occur at all system levels, including national health systems, health institutions, and patient-facing health services. Individual factors, such as female gender, older age or chronic health conditions, can be associated with worse physical and psychological well-being or lower quality of life and can translate to increased missed care (Beal, Mara, & Nause, 2022; Larsen, Goemans, & Baste, 2021). In addition, lower socioeconomic status, though a risk factor for children and youth in care, does not fully explain their chronic health disparities (Deutsch & Fortin, 2015; Hansen, Mawjee, & Barton, 2004). This study aims to examine YIC's health status and missed care on a population level in direct comparison to youth not in care (non-YIC), while taking into consideration these contributing covariates.

2. Methods

2.1. Participants

This study used data from the 2018 British Columbia Adolescent Health Survey (BC AHS), a province-wide, population-based, comprehensive health survey conducted by the McCreary Centre Society every 5 years (Smith, Poon, & Forsyth, 2018). The target population was 255,146 students in Grades 7 through 12 (ages 12–19 years) enrolled in mainstream public schools in the 2017–2018 academic year in British Columbia. An unweighted sample size of 38,015 students submitted usable responses (response rate 76.5 %). Students were randomly sampled by classroom across 58 school districts. The coverage rate was 95.3 % and considered highly representative of the target population. Responses were weighted by “probability of selection, non-response adjustment, and population readjustments” (Smith et al., 2018). The most common non-response reasons were student absence (13 %), parent consent form not returned (8 %), parent refusal (2 %), and student refusal (1 %). Although the vast majority (86.6 %) of students in British Columbia were enrolled in public schools, the survey would not have captured adolescents enrolled in private schools, home-schooling, alternative education programs, youth custody centers, distance or online education, or continuing education (Smith et al., 2018; Statistics Canada, 2022).

All participating students were given the 2018 BC AHS paper

questionnaire consisting of question items on their demographics, health, adverse experiences, and supportive experiences. The questionnaire was administered while students were at school and participant privacy was ensured while completing the questionnaire.

2.2. Predictor variable

YIC were defined as participants who reported “experienc[ing] any of these types of government care” currently or within the past year: “foster home”, “group home”, “youth agreement”, “placed with friend/relative through Ministry [of Children and Family Development] (kith and kinship agreement)”. Youth advisory committees consisting of current and former YIC provided input into the question design.

2.3. Outcomes

This study examined 2018 BC AHS question items on health and health care access. Participants rated their general health and mental health on a 4-point Likert scale (poor, fair, good, excellent). Missed care was measured by asking participants if they did not receive needed “medical help” or “emotional or mental health services” in the past 12 months. Participants who experienced missed mental health care were further asked to identify the reasons. Participants also identified where they accessed health care from a list of options. Gender differences in self-reported health and missed care within the YIC group were analyzed as a secondary outcome.

2.4. Covariates

Multivariate analyses controlled for age, gender, and food insecurity. Age was reported as integers between “12 years or younger” and “19 years or older.” Since grade enrollment is standardized by birth year in British Columbia, the expected number of students younger than 12 years or older than 19 years was negligible. Gender was reported as either male, female, neither, or unsure, of which the latter two were considered “non-binary” for data analysis. The effect of poverty was inferred by how frequently participants “go to bed hungry because there is not enough money for food at home” (never, sometimes, often, always). All responses other than “never” were considered “food insecurity,” a measure associated with low household income and poverty (Tarasuk, Li, & Fafard St-Germain, 2021). Alternate measures such as self-reported household income may be inaccurate for youth and inconsistently applicable to YIC.

2.5. Statistical analysis

Data were analyzed using IBM® SPSS Complex Samples [Version 25]. Analyses included descriptive frequencies, cross-tabulations, and logistic regressions. Data were considered statistically significant at $p < 0.01$ for comparisons between YIC and non-YIC and $p < 0.05$ for YIC in-group comparisons. For percentage estimates, standard errors (SE) less than 5 % were considered robust, between 5 % and 12.49 % were considered relatively high in sampling variability, and 12.5 % or higher were not reported (Smith et al., 2018). Percentages based on an unweighted sample size of fewer than 10 were not reported to maintain confidentiality.

2.6. Ethics review

The BC Adolescent Health Survey study was approved by the Behavioral Research Ethics Board, University of British Columbia (#H17-01307).

3. Results

3.1. Demographics

In British Columbia, 1.9 % of adolescents in mainstream public schools had lived in out-of-home placements within the past year, of whom 45.2 % had experienced kinship care, 35.9 % foster care, 26.2 % group homes, and 24.5 % youth agreements. The mean age was not statistically different between YIC and non-YIC groups. The proportion of females in both groups was similar, but the YIC group had fewer males and more non-binary youth. The YIC group had significantly higher food insecurity than the non-YIC group. Indigenous youth and youth with unknown family background were significantly overrepresented in the YIC group, whereas the non-YIC group had significantly higher proportions of youth with European, East Asian, and South Asian heritage (Table 1).

3.2. Health care accessed

YIC and non-YIC had similar rates of accessing any health care within the past year. However, YIC were significantly less likely to have seen family physicians and more likely to have visited counsellors, psychologists, youth clinics, or school wellness centers. The rates of accessing care from walk-in clinics, emergency rooms, nurses, and traditional healers were not statistically significant between the groups (Table 1).

3.3. Health self-rating and missed care

YIC consistently reported worse health than non-YIC. More than one-third (36.4 %) of YIC reported poor or fair general health and nearly half (46.5 %) reported poor or fair mental health, compared to 19.1 % and 27.6 % of non-YIC, respectively. After adjusting for age, gender, and food insecurity, YIC were significantly more likely than non-YIC to report poor or fair general health (model $\chi^2(4) = 43.81, p < .001$) and mental health (model $\chi^2(4) = 94.76, p < .001$) (Table 2).

YIC were significantly more likely to miss out on needed health care than non-YIC. Even after adjusting for age, gender, and food insecurity, this remained the case for both medical care (model $\chi^2(5) = 1149.87, p < .001$) and mental health care (model $\chi^2(5) = 2256.09, p < .001$). YIC had 2.2 times the odds of missing medical care and 1.6 times the odds of missing mental health care in the past year compared to non-YIC (Table 2).

When controlling for poor or fair general health, YIC continued to have nearly twice the odds of missing medical care in the past year compared to non-YIC (model $\chi^2(6) = 1809.27, p < .001$). However, the odds of missing mental health care in the past year became statistically similar between YIC and non-YIC when adjusted for poor or fair mental health (model $\chi^2(6) = 5935.55, p < .001$) (Table 2).

3.4. Reasons for missed mental health care

When asked to identify their reasons for missing needed mental health care in the past year, YIC were significantly more likely than non-YIC to report prior negative mental health care experiences, lack of transportation or a willing caregiver to transport them, inability to attend during open hours, and being on a waiting list. YIC were significantly less likely than non-YIC to report concern about parental discovery and thinking the problem would self-resolve, though these were also the two most common reasons for both groups. Other reasons were not significantly different between the groups, including fear of what the doctor might say or do, not knowing where to go, fear of being seen by someone they know, being too busy, and worries about cost (Table 3).

3.5. Gender differences

Female YIC were found to be at greater risk than male YIC with

Table 1
Demographic characteristics of youth in care (YIC) and non-YIC in the British Columbia Adolescent Health Survey, 2018.

	YIC % (SE)	Non-YIC % (SE)	Adj. F (df1, df2)	p- value
Weighted proportion of population	1.9 (0.1)	98.1 (0.1)	–	–
YIC in kinship care in past year	45.2 (2.0)	–		
YIC in foster home in past year	35.9 (1.9)	–		
YIC in group home in past year	26.2 (1.8)	–		
YIC in youth agreement in past year	24.5 (1.7)	–		
Age, years; mean (SE)	14.8 (0.07)	14.9 (0.01)	4.36 (1, 1777)	0.037
Gender			31.76 (2, 3550)	<
Female	50.9 (2.0)	49.3 (0.4)		0.001
Male	42.9 (2.0)	48.9 (0.4)		
Non-binary	6.2 (1.0)	1.8 (0.1)		
Food insecurity	30.3 (1.9)	9.0 (0.2)	311.39 (1, 1777)	< 0.001
Family background				
Indigenous	37.9 (2.0)	9.8 (0.2)	502.52 (1, 1777)	< 0.001
European	35.6 (2.0)	48.1 (0.5)	35.16 (1, 1777)	< 0.001
East Asian	9.9 (1.4)	15.4 (0.4)	11.11 (1, 1777)	0.001
Southeast Asian	9.2 (1.3)	8.0 (0.3)	0.96 (1, 1777)	0.33
South Asian	5.4 (1.0)	11.9 (0.4)	19.06 (1, 1777)	< 0.001
Latin/Central/South American	4.0 (0.9)	4.6 (0.1)	0.39 (1, 1777)	0.53
African	3.5 (0.8)	2.8 (0.1)	1.05 (1, 1777)	0.31
Pacific Islander or Australian	2.1 (0.7)	2.0 (0.1)	0.03 (1, 1777)	0.87
West Asian	2.0 (0.6)	2.9 (0.1)	1.58 (1, 1777)	0.21
Other	3.0 (0.7)	3.6 (0.1)	0.82 (1, 1777)	0.37
Don't know	15.1 (1.5)	10.2 (0.2)	14.68 (1, 1777)	< 0.001
Where youth received health care in past year				
Family doctor	53.3 (2.1)	63.9 (0.3)	27.88 (1, 1777)	< 0.001
Walk-in clinic	33.8 (2.0)	36.0 (0.3)	1.12 (1, 1777)	0.29
Counsellor or psychologist	30.6 (1.9)	11.5 (0.2)	193.57 (1, 1777)	< 0.001
Emergency room	20.1 (1.7)	16.7 (0.2)	4.50 (1, 1777)	0.03
Nurse	11.8 (1.3)	8.9 (0.2)	6.07 (1, 1777)	0.01
Youth clinic	9.4 (1.2)	3.6 (0.1)	52.36 (1, 1777)	< 0.001
School wellness centre	5.1 (0.9)	1.7 (0.1)	37.09 (1, 1777)	< 0.001
Traditional healer	2.1 (0.6)	1.0 (0.1)	6.69 (1, 1777)	0.01
Any of the above	80.7 (1.6)	78.6 (0.3)	1.63 (1, 1777)	0.2

Table 2
Health self-rating and missed care among youth in care (YIC) and non-YIC in the British Columbia Adolescent Health Survey, 2018.

	YIC % (SE)	Non- YIC % (SE)	Adj. F (df1, df2)	AOR ^a [99 % CI]	AOR ^b [99 % CI]
Poor/Fair General Health	36.4 (2.0)	19.1 (0.2)	108.74 (1, 1777) [*]	1.81 [1.40–2.34]	–
Poor/Fair Mental Health	46.5 (2.1)	27.6 (0.3)	100.91 (1, 1777) [*]	1.81 [1.42–2.32]	–
Missed Medical Care	21.6 (1.6)	7.8 (0.2)	163.93 (1, 1777) [*]	2.21 [1.67–2.94]	1.96 [1.46–2.62]
Missed Mental Health Care	32.9 (1.9)	18.4 (0.3)	79.44 (1, 1777) [*]	1.60 [1.22–2.09]	1.18 [0.86–1.62]

^{*} $p < .001$.

^a Controlled for age, gender, and food insecurity. Reference group is non-YIC.

^b Controlled for age, gender, food insecurity, and health self-rating. Reference group is non-YIC.

Table 3
Reasons for missed mental health care among youth in care (YIC) and non-YIC in the British Columbia Adolescent Health Survey, 2018.

	YIC % (SE)	Non- YIC % (SE)	Adj. F (df1, df2)	p - value
Why youth missed mental health care in past year				
Didn't want parents to know	53.3 (3.6)	63.3 (0.7)	7.92 (1, 1660)	0.005
Thought or hoped the problem would go away	52.5 (3.7)	64.3 (0.7)	10.95 (1, 1660)	0.001
Afraid of what the doctor would say or do	52.4 (3.7)	43.9 (0.7)	5.34 (1, 1660)	0.02
Didn't know where to go	47.4 (3.8)	43.6 (0.7)	0.96 (1, 1660)	0.33
Afraid someone I know might see me	40.2 (3.5)	38.0 (0.7)	0.40 (1, 1660)	0.53
Too busy to go	28.2 (3.4)	36.7 (0.7)	5.24 (1, 1660)	0.02
Had negative experience(s) before	27.4 (3.3)	14.2 (0.5)	24.68 (1, 1660)	< 0.001
Didn't think I could afford it	26.6 (3.3)	21.4 (0.6)	2.82 (1, 1660)	0.09
Parent or guardian would not take me	22.3 (3.2)	11.0 (0.4)	20.49 (1, 1660)	< 0.001
No transportation	19.8 (2.9)	10.0 (0.4)	18.00 (1, 1660)	< 0.001
Couldn't go when it was open	11.5 (2.3)	4.8 (0.3)	16.66 (1, 1660)	< 0.001
On a waiting list	9.1 (2.1)	4.6 (0.3)	7.41 (1, 1660)	0.007
Service not available in my community	- ^a	1.8 (0.2)	- ^a	- ^a

^a Not reported due to risk of deductive disclosure.

respect to their health self-ratings and missed health care. Notably, nearly two-thirds (63.4 %) of female YIC reported poor or fair mental health compared to approximately one-quarter (25.6 %) of male YIC. After adjusting for age and food insecurity, female YIC were significantly more likely than male YIC to report poor or fair general health (model $\chi^2(4) = 43.81, p < .001$) and mental health (model $\chi^2(4) = 94.76, p < .001$), having more than twice the odds of reporting poor or fair general health and nearly five times the odds of reporting poor or fair mental health compared to male YIC. For missed care, female YIC had more than three times the odds of missing needed medical care (model $\chi^2(5) = 81.53, p < .001$) and more than twice the odds of missing needed

mental health care (model $\chi^2(5) = 150.77, p < .001$) compared to male YIC (Table 4).

Non-binary YIC were also significantly more likely than male YIC to report poor or fair general health, poor or fair mental health, and missed mental health care. Data for non-binary YIC were cautiously interpreted due to high sampling variability. In addition, data for non-binary YIC's missed medical care were below the sample size threshold for confidentiality so were not reported (Table 4).

4. Discussion

In this cross-sectional population study of Canadian adolescents, YIC's health status and prevalence of missed care, both for general health and mental health, were compared directly with their non-YIC peers. Our findings showed that YIC experienced significantly worse general health and mental health than non-YIC did, even when controlling for socioeconomic differences. In addition, YIC had more than twice the odds of missed medical care and more than 1.5 times the odds of missed mental health care compared to their non-YIC peers. These results point to health care accessibility as a major issue for YIC. Barriers YIC faced when accessing health care included individual barriers (e.g., prior negative experiences), environmental barriers (e.g., unsupported by guardian, lack of transportation), and systemic barriers (e.g., impractical hours, long waitlists).

Our findings support recent out-of-home care experience as an important factor in missed medical care for YIC, independent from youth's general health status. However, for mental health, the association between missed care and mental health status was stronger than the association with recent out-of-home care experience. This implies adolescents with worse mental health have higher rates of missed mental health care, regardless of their living situation. One could hypothesize a positive feedback relationship between poor mental health and missed mental health care. Furthermore, both YIC and non-YIC reported very high prevalences of poorer mental health (46.5 % and 27.6 %, respectively), reflecting a youth mental health system that is potentially overwhelmed by the demand, regardless of living situation.

In order to better understand the correlation between recent out-of-home care and youth's health, statistical analyses adjusted for age, gender, and food insecurity. The 2018 BC AHS's use of self-reported data captured youth's subjective health experiences, which are highly relevant to a person-centred model of health and illness (Balaj, 2022; World Health Organization, 2022). Self-reported physical health and mental health have been shown to correlate to validated global quality of life measures in adolescents (Sawatzky, Ratner, & Johnson, 2010). Future work linking YIC's self-reports with clinical data or validated measures of quality of life and health-risk behaviors may be useful to explore.

The cross-sectional study design was neither able nor intended to distinguish causality. Many YIC have lived through traumatic experiences and acquired other risk factors that increased their likelihood of being placed in out-of-home care. We recognize indigenous youth are enormously overrepresented among YIC. Their health needs deserve dedicated future examination in partnership with indigenous communities to provide cultural context and to eschew inadvertent stigmatization. Another limitation was simplifying the socioeconomic complexities of poverty into the proxy measure of food insecurity for data analysis. This study serves to describe YIC as a distinct group who have high, unmet health care needs and inequitably poor health care access, rather than draw causal conclusions about the out-of-home care system. Nonetheless, these findings can inform and advocate for YIC during their interactions with child welfare and health care.

Although gender disparity was not the primary focus of this study, we found that female YIC reported significantly worse physical and mental health than male YIC and had significantly higher rates of missed care. This is consistent with gender differences observed across the general adolescent population, such as higher rates of poor mental health among female adolescents globally compared to males

Table 4

Gender differences in health self-rating and missed care among youth in care (YIC) in the British Columbia Adolescent Health Survey, 2018.

	Female	Non-Binary	Male	Adj. F (df1, df2)	AOR [95 % CI]	
	% (SE)	% (SE)	% (SE)		Female	Non-Binary
Poor/Fair General Health	43.8 (2.9)	45.4 (8.4)	25.0 (2.7)	10.90 (2, 904)*	2.23 [1.53–3.27] ^b	2.57 [1.21–5.45] ^b
Poor/Fair Mental Health	63.4 (2.8)	50.6 (8.7)	25.6 (2.8)	36.01 (2, 907)*	4.90 [3.28–7.33] ^b	3.10 [1.39–6.92] ^b
Missed Medical Care	30.7 (2.6)	- ^a	9.5 (1.8)	17.66 (2, 909)*	3.47 [2.01–5.99] ^c	–
Missed Mental Health Care	44.9 (2.9)	40.6 (8.0)	16.9 (2.4)	24.05 (2, 905)*	2.21 [1.32–3.71] ^c	2.99 [1.29–6.92] ^c

* $p < .001$.^a Not reported due to risk of deductive disclosure.^b Controlled for age and food insecurity. Reference group is males.^c Controlled for age, food insecurity, and health self-rating. Reference group is males.

(Campbell, Bann, & Patalay, 2021). One methodological consideration is school-based surveys may not be equally effective at sampling male YIC, as male youth are known to have a higher school dropout rate than female youth, which is partly associated with chronic disability and poor mental health (Uppal, 2022). Moreover, societal factors, such as gendered socialization of health perception and inequities due to gender discrimination, may be contributors but are difficult to measure in this context. Research dedicated to the health of non-binary YIC also deserves further exploration, as our small sample suggests they are similarly a high-risk group for poorer health and missed care.

Despite the robust methodology of sampling in mainstream schools for this population study, certain groups with higher proportions of YIC would have been excluded, such as those enrolled in alternative education programs or disconnected from education altogether (Smith, Peled, & Albert, 2008). YIC with poorer health would likely have had more difficulty with school attendance or returning consent forms to participate in the survey. However, these limitations should yield a more conservative estimate of YIC's health barriers, whereas the true degree of YIC's health inequities is likely greater than this study's findings. Future studies utilizing case-control sampling, community-based participatory action research, or ethnographic methods may arrive at a more nuanced understanding of YIC's experience of their health.

5. Conclusions

YIC are significantly and disproportionately disadvantaged in their physical and mental health and their ability to access health care. Although YIC are a distinct population that has a greater burden of health care needs, the current distribution of health care resources is insufficient for YIC to achieve an equitable state of health compared to their non-YIC peers. Further attention is needed to address systemic, environmental, and individual barriers to health care access for YIC, especially female and non-binary YIC.

CRedit authorship contribution statement

James X. Wang: Conceptualization, Formal analysis, Methodology, Visualization, Writing – original draft, Writing – review & editing. **Sheila K. Marshall:** Conceptualization, Methodology, Supervision, Writing – review & editing. **Colleen Poon:** Conceptualization, Data curation, Formal analysis, Methodology, Writing – review & editing. **Annie Smith:** Conceptualization, Supervision, Writing – review & editing.

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

The authors do not have permission to share data.

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