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A Pilot Study of Adolescent Health Literacy Research in Melbourne: Implementation and Reflections

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ABSTRACT

Issues addressed: While adolescent health literacy research has gained momentum, there is little evidence regarding its implementation and data collection in school settings. This study explored the feasibility of collecting health literacy data from Australian secondary schools and piloted three health literacy instruments.

Methods: A cross-sectional study was designed to recruit four government secondary schools in Melbourne. Active, opt-in consent was obtained from parents and students in Years 7-9, and an online survey was conducted. Three health literacy instruments were used: the 8-item Health Literacy Assessment Tool (HLAT-8), the Newest Vital Sign (NVS), and the 47-item Health Literacy Survey (HLS-47).

Results: A total of 120 students (age 12-15 years) were finally recruited from one school, whereas the other three schools declined due to busy educational commitment or no interest in research. Learnings and reflections on data collection included: a shared perspective of health literacy evaluation between school and researchers; the feasibility of online data collection; and the possibility of obtaining passive, opt-out consent. About one-quarter (23.7~32.2%) of students were likely to have poor health literacy.

Conclusions: Although the recruitment was challenging, this pilot study indicates the feasibility of large-scale online health literacy survey in future school-based research.

So what? Measuring and monitoring adolescent health literacy is essential to achieve the aim of the Australian Curriculum of Health and Physical Education. More implementation research is needed with representative samples to validate health literacy instruments and examine the impact of health literacy on health promotion outcomes in Australian adolescents.

Keywords: health literacy; schools; adolescents; pilot studies; implementation; Australia

1 INTRODUCTION

Adolescent health literacy, defined as an individual's ability to find, understand and use health information to maintain and promote good health (1, 2), has gained increasing attention over the last decade. Compared with adult health literacy, adolescent health literacy has six unique characteristics (i.e. 6'D'): demographic patterns (adolescents are particularly vulnerable to social and health inequalities), differential epidemiology (some disease and health risks are highly age-specific to adolescents), developmental change (e.g. biological, cognitive, psychological), dependency (on parents and peer groups), democratic citizenship (adolescents are social actors within their own right) and digitalisation (digital media are an integral component of their daily lives) (3). National and international studies show that poor adolescent health literacy is associated with a range of adverse health outcomes (e.g. smoking, obesity, and poor health status) (4-6). From a health promotion perspective, improving health literacy at an earlier age is cost-effective to reduce health inequities (7).

While the term 'health literacy' is widely used in research and practice (8-10), few studies have been conducted with Australian adolescents. The 2006 national survey showed that 67.6% of 15-19 year-olds had poor health literacy (11). Although the Australian Curriculum of Health and Physical Education (hereafter refers to National Curriculum) is committed to developing students' health literacy to promote their health and wellbeing (12), there is little evidence regarding health literacy levels and the implementation process of health literacy data collection in schools. One possible reason is the lack of appropriate health literacy instruments for use within this population. In our previous systematic review (1), we identified 29 health literacy instruments in children and adolescents. However, half of these instruments measured health literacy on a single domain (e.g., the ability to read and understand), not capturing the multi-dimensional nature. Besides, the measurement properties of most included instruments were unknown, due to either poor methodological quality of studies or a lack of reporting.

Schools are the most common places where adolescents spend most of their daytime and are critical venues for improving health literacy through school health curricula (13, 14). Investment in child and adolescent health, including their health literacy, is crucial to reduce health inequities now and for future generations (1, 3). Given the 6 'D' unique characteristics mentioned above, adolescent health literacy measurement requires considering its context-and-content-specific nature with a particular research purpose (1, 3). In the present study, we piloted three frequently-used health literacy instruments and reported the implementation process and

challenges to inform future health literacy practice in school settings. The three health literacy instruments were selected based on our systematic review findings and their extensive use (1, 4, 5). Besides, using multiple tools to measure health literacy in a single study provided different views of students' health literacy and would enhance the rigour of findings.

2 PROJECT BACKGROUND

This pilot study was part of a PhD research project, which aimed to understand and measure health literacy in secondary students in Beijing and Melbourne (15). The PhD project consisted of four studies: 1) a systematic review that examined psychometric properties of health literacy instruments used among children and adolescents (1); 2) a validation study that tested the psychometric properties of the 8-item Health Literacy Assessment Tool (HLAT-8) in Beijing adolescents (2), based on findings from the first study; 3) a cross-sectional study that investigated the mediating role of adolescent health literacy in the relationship between its antecedents and health outcomes in Beijing adolescents; and 4) a pilot study that explored the feasibility of health literacy data collection from Australian secondary schools. A common thread that ran through these four studies was health literacy measurement, which was a starting point of examining health literacy disparities and informing next-step interventions. Ethics approval was obtained from the University of Melbourne and the Victorian Department of Education and Training.

3 PROJECT DEVELOPMENT AND IMPLEMENTATION

3.1 School recruitment

A cluster convenience sampling method was used to recruit students from four government secondary schools in Melbourne, Australia. First, five areas in Victoria where many Chinese-born migrants lived (i.e., Inner Melbourne, Whitehorse, Monash, Boroondara and Manningham) were identified from the Social Health Atlas of Australia. Second, four government secondary schools located in these areas were identified based on the location's socioeconomic status (SES) (two in high SES district and two in low SES district), students' language backgrounds (≥ 50% of students speaking English as a second language), and school enrolment size (≥ 100 students). We then contacted four school principals by email, and only one principal replied and had an interest. To learn why the other three school principals did not respond, we gave each school principal a follow-up call one week after sending the email. The other three school principals declined to participate either due to a busy educational timetable, or because they had no interest in the research. Finally, only one school in the high SES district participated.

3.2 Participant recruitment

All students (n=918) in Years 7 to 9 in the pilot school were invited to participate in the health literacy survey. Students were approached using recruitment strategies shown in Figure 1. First, following the ethics approval, we got the support from the school principal by email. The school principal introduced researchers to school representatives. A research protocol was sent to school representatives, and a face-to-face meeting was arranged to discuss details of the data collection procedure. Second, parental consent forms and plain language statements were sent to parents via the school online system Compass by the school information technology team. Parents were invited to complete an online consent form. Finally, all students in Years 7 to 9 were invited to participate in an online survey via the Survey Monkey. With support from health and physical education teachers, an online consent form and a plain language statement were also sent to each student before data collection. All students who gave their consent completed the online survey when participating in the first health and physical education class in the third school term (July and September 2016).

3.3 Questionnaire

The online health literacy survey was designed based on Manganello's health literacy framework (7), which included information on intrapersonal factors, interpersonal factors, environmental factors, health literacy and health-related outcomes. With a focus on health literacy, here we only reported three measures used in this pilot study: the HLAT-8, the 6-item Newest Vital Sign (NVS) and the 47-item Health Literacy Study (HLS-47). The HLAT-8 and the HLS-47 were self-report instruments that measured an individual's ability to access, understand, evaluate, and communicate health information in everyday life (16, 17). While these two measures were comprehensive in terms of measurement domains, they might bring about self-report bias. The NVS was a performance-based measure for reading comprehension and numeracy (18). Although it was an objective measure, it was limited in the single measurement domain. We included three instruments in a single study to provide an overall picture of students' health literacy levels. The total score range of each instrument was 0-37, 0-6 and 0-50, respectively, with higher scores indicating higher health literacy levels. Scores of 0-3 for the NVS and scores below 33 for the HLS-47 indicated poor health literacy.

3.4 Statistical analysis

All statistical analyses were conducted using STATA 16.1. Descriptive statistics were conducted to examine participants' socio-demographics and health literacy scores. Spearman correlation analysis was used to examine correlations between scores of different health literacy instruments.

4 RESULTS

In total, 120 students participated in the online survey, resulting in a low response rate (13.1%, 120/918). The mean age of students was 13.63 ± 1.03 (age range: 12-15). Table 1 shows the distribution of students' socio-demographics and health literacy levels. About one-quarter of students had poor health literacy: 32.2% (38/118) when using the NVS and 23.7% (28/118) when using the HLS-47. Spearman correlation analysis showed that the HLAT-8 was moderately correlated with the HLS-47 ($r=0.58$, $p<0.01$). However, the NVS was neither correlated with the HLAT-8 ($r=0.03$, $p=0.76$), nor correlated with the HLS-47 ($r=0.08$, $p=0.39$).

5 DISCUSSION

We conducted a pilot study that explored the feasibility of health literacy data collection from Australian secondary schools. There were three main learnings and reflections on health literacy research in practice. First, there was a shared perspective on health literacy evaluation between the pilot school and researchers. School representatives had an interest in this project because they would like to learn about students' health literacy levels and use the findings to inform school-based health curricula designing. However, this was not a common interest for the other three schools who declined. Although "health literacy" is explicitly included in the aim of the National Curriculum, this term has been less frequently used in school settings compared to other terms such as "mental health prevention". One possible way to improve response rate is to advocate the importance of "health literacy" in the National Curriculum and raise school principals' awareness by using successful programs like the HealthLit4Kids in Tasmania (14). Meanwhile, as shown in previous successful school health programs in the USA (19), assistance with school recruitment is also necessary from state or local health education sectors.

Second, online data collection was feasible and resource-saving in practice. All students in the pilot school used laptops or tablets in class, thus making the data collection process time-efficient and less expensive. However, 211 students who received parental consent did not complete the survey because some teachers did not provide time in class. Given that the first

class of health and physical education in the third semester was the only available survey time in the pilot school, future implementation research may consider using the Ophelia principles for better collaborations (20). For example, two principles (co-design approach and driven by local wisdom) are particularly important for the successful implementation process. Researchers need to co-design all activities (e.g. time, resources, technical support) from data collection, interpretation and allow local teachers to provide ideas in response to potential challenges (20).

Finally, obtaining informed consent from parents was challenging, with only 36.1% (331/918) of students having parental consent. Opt-in consent is deemed ethically more defensible because it provides assurance that a parent has read, understood and signed the consent form (21). However, it limits participation and introduces bias into studies (22). One possible way to increase consent rate is to have passive, opt-out consent. Although the term 'opt-out consent' is not explicitly mentioned in the National Statement on Ethical Conduct in Human Research, the Statement (i.e. Section 4.2.10 to 4.2.12) implies that an opt-out form of consent could occur in school settings (21). An opt-out methodology is generally acceptable in low-risk studies and provides more representative data. Compared with opt-in consent, opt-out consent is also less costly and less burdensome to teachers and students (22). On the contrary, it is ethically risky because it relies on inattention rather than fostering personal autonomy (21). Therefore, it is incumbent upon researchers and ethics committee to ensure the information provided is simple, detailed and easily understood.

6 CONCLUSIONS AND IMPLICATIONS

Although it was challenging to recruit schools and students, this pilot study provided useful insights into future large-scale health literacy surveys in Australian schools. Measuring and monitoring adolescent health literacy is an integral part of designing and delivering health promotion programs that address health inequities and improve health outcomes (1). Evidence has shown that there is a social gradient in adolescent health literacy (23, 24), which in turn leads to health promotion outcomes. Adolescents with high health literacy levels are more likely to have health-promoting behaviours, communicate effectively with health professionals, and perceive their health status as good (4, 5, 24). Due to the small sample size, we did not test the reliability and validity of the three health literacy instruments and did not investigate the relationship between adolescent health literacy and health outcomes. More empirical evidence

is needed to better understand and translate health literacy research into practice, thus contributing to a vision of health literate schools in Australia.

Meanwhile, given that most students in the pilot school had higher socioeconomic status, the prevalence of poor health literacy was probably much higher in the general population. Future research with more representative samples is needed to examine the psychometric properties of these health literacy instruments. In practice, there remain challenges about how to best measure adolescent health literacy (e.g. considering the 6'D' characteristics, comprehensive measurement domains, feasibility, cultural sensitivity) in school settings (1, 3, 23). However, using a single measure of health literacy and integrating it as part of students' health questionnaires would be more cost-effective and less time burden.

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Table 1. Students' socio-demographics and health literacy levels in the pilot school (n=120)

Participant characteristic	Mean ± SD or frequency (%)
Gender	
Male	73 (60.8)
Female	47 (39.2)
Year level	
Year 7	32 (26.7)
Year 8	35 (29.2)
Year 9	53 (44.2)
Country of birth	
Australia	84 (70.0)
Mainland China/Hong Kong/Macao/Taiwan	13 (10.8)
Other countries	23 (19.2)
Years of living in Australia*(n=36)	7.56 ± 3.95
First language spoken at home	
English	85 (70.8)
Chinese	20 (16.7)
Other languages	15 (12.5)
Family structure	
Living with both biological parents	105 (87.5)
Other types of families (e.g. living with a single parent)	15 (12.5)
Socio-economic status	
Low	2 (1.7)
Medium	28 (23.3)
High	90 (75.0)
Health literacy	
HLAT-8	28.25 (6.00)
NVS	4.13 (1.73)
HLS-47	37.72 (8.40)

HLAT-8, the 8-item Health Literacy Assessment Tool; HLS-47, the 47-item Health Literacy Study; NVS, the 6-item Newest Vital Sign; SD, Standard Deviation.

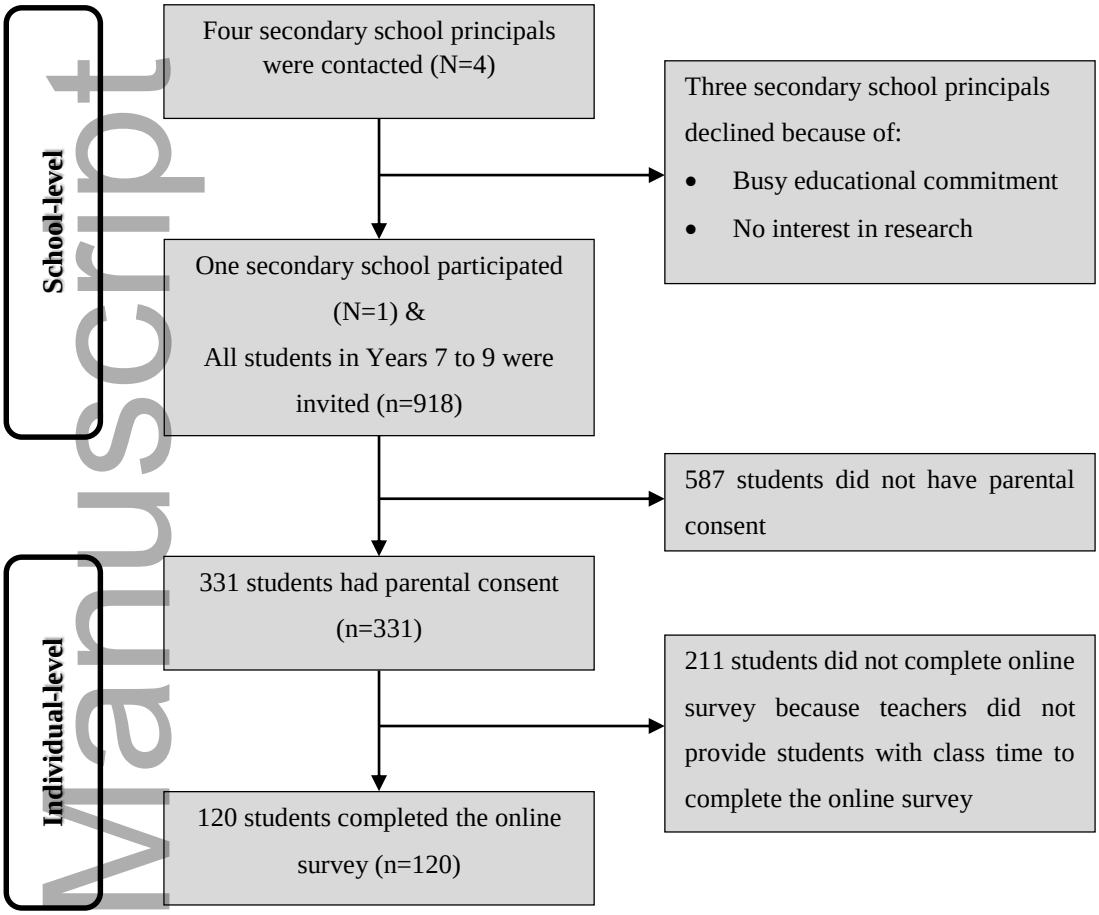

Figure 1: Flowchart of recruitment for secondary schools and students