



Timing of Sexuality Education: Hong Kong Preteens' Perception of Sexual Health

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Abstract

Although young people want to know more about sexuality, they do not feel they have received what they need to learn. In Chinese societies, scant research has solicited direct input from the youth to obtain their views on sexuality education (SE) deliverables. We found research gaps in the lack of Chinese preteens' input regarding SE timing, knowledge perception, learning readiness, and preteens' reasons for obtaining information about sexual health. In Hong Kong, a not-for-profit agency collected data from Chinese preadolescents who expressed opinions through a general survey. This agency surveyed students from 24 primary schools and provided anonymous secondary data for this team to analyze further. Among 4569 fifth- and sixth-grade students (average 11 years old), girls were more likely than boys to seek sex-related information from teachers, library books, and mothers. In contrast, boys were more likely than girls to obtain information from friends, pornographic comics, and the internet. Logistic regression analysis indicated that gender, age, instructional sources, openness to sexual health knowledge, and perceived and actual levels of knowledge predicted preteens' desire to receive SE earlier in grade school. Girls and older students were significantly more likely to report their preference to receive SE in an earlier grade. We recommend that preteens and their parents be encouraged to collaborate with teachers to participate in school-based SE programming.

Keywords Early timing · Preteen sexuality knowledge · Sexual health promotion · Child sexual abuse prevention · Learning readiness

Introduction

Sexuality education (SE) aims to clarify sexual terminology, remove misconceptions about sex, engage parents in children's learning, prevent sexual abuse, and reduce risky behaviors (Stone et al., 2013). Research supports sexuality

information addressed at a child's pre-pubertal stage as a sexual abuse prevention tool (Kahn & Halpern, 2018; Lavery et al., 2021). Prior studies have addressed how the USA and Canada promote youth awareness of sexual well-being (Future of Sex Education Initiative [FSEI], 2020; Sex Information and Education Council of Canada [SIECC], 2020; United Nations Educational, Scientific and Cultural Organization [UNESCO], 2018). Even though these international reports identified the positive aspects of SE for young children, we could not find similar studies targeting Chinese children regarding their sexual health knowledge. Parenting consultants consider delivering SE at home and school a "value-added" approach to teaching young children healthy behaviors (Hirst, 2004). There are studies on how adults define the timing of SE delivery (Hoyt et al., 2020); however, there are no studies on how children define it. Therefore, we first examined existing research gaps that led to our study on when to start SE with a focus on sexual health.

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Timing to Deliver Formal Sexuality Education

Adults typically define the ideal environments for children to receive SE. Hirst (2008) purports that the open atmosphere in schools provides a learning environment to promote sexual health education, including sexuality and relationships, and to encourage children to learn about self-concepts. Many children think of sex as sexual intercourse or penile–vaginal penetration (Hyde et al., 2013). This association makes them think that SE is about abstinence from sex (Fentahun et al., 2012). Even when parents want to find opportunities to talk about sexual health with their children, they may still be concerned about “my children are too young” as an excuse not to start the sex-related conversation (Wilson et al., 2010). Children also feel embarrassed, thinking sex is a dirty or awkward subject (Christensen et al., 2017). However, there are gaps in knowledge about how much preteens know, what they should know, and what channels they voice their learning needs.

Children’s age is a crucial factor in SE planning. A survey on school education described “early” as “before the age of 15,” as reported by parents, educators, and community leaders but not directly by children (School Education Gateway, 2019). Recent research defines “the new puberty” as when many girls show early signs of puberty before age seven (Roberts, 2018). As a result, there is a research gap between determining maturity based on biological changes and defining “early timing” (or “earlier timing”) of SE from young children’s perspective (Jackson, 2020). Even though the early timing concept is not operationally defined (Caputo, 2007), a study reported that college attendees expressed concerns about not having SE during childhood (Spriggs & Halpern, 2008). When the concept of “early timing” was measured in this study, it referred to an earlier time than the student’s current grade.

Some studies explored the starting age of SE based on puberty (Bodnar & Tornello, 2019; McKee et al., 2007). The National Sexuality Education Standards supported that among 15–19-year-old teens, those with comprehensive SE were 50 percent less likely to report pregnancy than those with abstinence-only education (FSEI, 2020). Even though adolescence is considered the time to build healthy habits relating to sexual health, children can understand and maintain good health since early childhood (UNESCO, 2018). These findings support pre-puberty as a starting point for discussing sexual health. When parents realize the need to “early” start SE to clarify inaccurate messages, they still think the optimal time for children to receive SE is generally “before initiating sexual behaviors” (Fisher et al., 2015, p. 15). Holway (2015) presented data to support early SE timing in a study with 7th through 12th graders. These preteens disclosed that they encountered their first oral or

vaginal sex around age ten and that they might be fearful about pregnancy and sexually transmitted diseases (STDs). Still, the timing for school-based SE preferred by children in primary school is seldom studied (Somers & Eaves, 2002; Suleiman et al., 2015).

Factors Related to Preteens’ Sexuality Education Readiness

Children’s information-seeking behaviors determine their first SE learning motivation. The early onset of sexual curiosity connects to the high variability in how children look for information (Powell, 2008). School-based prevention programs help preteens postpone sexual engagement compared to those receiving sex information from other adults, media, or friends (Somers & Surmann, 2005; Walker, 2004). In an internet-accessible environment, children use social media to obtain sex-related information and watch over-sexualized images (Bale, 2011). However, access to information and sexual images does not always increase children’s desire or readiness to receive formal SE.

The second factor is early puberty among preteens. In a short commentary in 1997, Portner stressed the importance of starting SE in the 5th grade due to early puberty found in American girls (Portner, 1997). Recent literature presented gaps in the design of the SE curriculum when the message is to “save sex for later” (O’Donnell et al., 2007). While younger children prefer asking parents about sex-related uncertainties, they still face barriers to open communication due to the fear of authority and the social taboo associated with asking sex-related questions (Guilamo-Ramos & Bouris, 2009; Tesso et al., 2012). Chinese parents may indicate readiness to receive sexual development information but do not know how to address young children’s confusion about sex and sexuality (Breuner & Mattson, 2016).

The third factor is the youth’s perception of sexual knowledge. In a recent study, the variations in youth’s understanding of sexuality by ethnicity and gender can influence their attitudes toward sexual health (Hino et al., 2021). When SE is planned based on children’s characteristics, there is a gender difference in content expectations as girls tend to define SE as learning about moral values; in contrast, boys define it as a learning opportunity on condom use (Flores & Barroso, 2017). Their perceptions lead to thinking that sex should be the topic, but SE planners do not obtain input from young children (Fentahun et al., 2012; Formby, 2011). In the Chinese community, parents do not seek help even when their children have sexual problems (Liang & Bowcher, 2019). Studies on these “reserved” attitudes have not focused on young people’s sexual knowledge.

The fourth factor is the preteens’ understanding of the prevention function of the SE curriculum. When we reviewed relevant literature, we did not find studies focusing on

primary schoolers' input on curriculum design. However, recent research has started examining the extent youth might believe early SE could help them prevent sexual abuse. For example, Kahn and Halpern (2018) indicated that parents used SE information to help children practice various repertoires for refusing sexual advances. In the Chinese community, Guo et al. (2012) found that parents expected the school to be the communicator addressing the risks of early sex debut and unwanted pregnancy. A recent study about sex education in China focused on the teaching styles and orientations of sex educators, not the children (Zhao et al., 2020). In another study, Chinese teens (not preteens) expressed their retrospective view on the importance of early parental involvement in SE, wishing to learn about human sexuality earlier to prevent sexual advances (Liu et al., 2017).

Rationale

In most SE studies, the target subject is adolescents, parents, or teachers, not preadolescents or Chinese primary schoolers. In our review, we found four research gaps: (1) SE delivered to primary schoolers with input from children; (2) the impact of early puberty on children's information-seeking intent; (3) SE as a sexual abuse prevention tool; and (4) preteens' self-assessment of sexual health knowledge. The lack of children's input was a common cause of gaps in the literature. Therefore, this study aims to collect children's voices to testify to their need to learn earlier in primary school.

Hong Kong was the study location focusing on Chinese primary school students. Hong Kong SE studies concentrate on adolescents and professionals who work with adolescents but not on young children or preteens (e.g., Andres et al., 2021; Wong et al., 2006; Yip et al., 2015). Wang et al. (2005) indicated that youth participation in SE would predict "protective effects" such as contraceptive use to prevent teen pregnancy. Still, their implications did not target young children or preteens.

This study emphasizes the importance of getting direct input from children. Research literature has documented that Hong Kong secondary schools have implemented SE (Che, 2005). In the government document, the Hong Kong Education Bureau listed SE topics be a standard subject in the "Primary Five" school curriculum but indicated no mandate for its implementation. The government suggested SE including five themes: "(a) human development; (b) interpersonal relationships; (c) sexual health; (d) sexual behavior; and (e) culture, society and law" (Legislative Council, 2018). Tangible recognition of changes in Chinese attitudes and behaviors toward sex became evident in the 1980s when secondary schoolers learned sex-related concepts in health classes. However, critics stated that SE in Hong Kong needs a structure because it had uneven implementations across the city (South China Morning Post, 2020). We analyzed data

collected from students in Primary Five (P5 or 5th grade) and Primary Six (P6 or 6th grade). In Hong Kong, these two grades are the final years at the elementary school level.

Method

This research team analyzed an existing dataset from the End Child Sexual Abuse Foundation (ECSAF), a social service agency in Hong Kong. This dataset contained preteens' responses to an anonymous survey about sexuality knowledge and attitude toward SE. A unique aspect was the retrospective view of these preteens about receiving SE when they were in an earlier grade. This "timing" variable item was an opinion question rather than asking what specific age to start. If the respondents did not know much about sexual health, they would still feel comfortable giving an opinion. Schaalma et al. (2004) called this a "health promotion" strategy in that the respondents would think their input was important (p. 259). This study hypothesized that primary school students' openness to sexual health knowledge predicts their early timing agreement. Through analyzing the data collected by the agency, we sought answers to four research questions: (1) Was sexual knowledge sufficient from a child's perspective? (2) Was the discrepancy between the preteens' perception and reality of sexuality associated with their level of sexual health knowledge? (3) Would preteens' open attitude predict their "early timing" agreement to receive SE? (4) Would Chinese preteens reveal sexual abuse and other sexuality issues through an anonymous SE survey?

Participants

With a mission to protect children from sexual abuse, the ECSAF conducted this SE survey among P5 and P6 students in Hong Kong. Since P5 and P6 are the final two grades in the primary school system in Hong Kong, these students represent young people transitioning from childhood to pre-adolescence and adolescence as they will move from primary school to secondary school after P6. The agency's social workers and educational specialists consulted with two experts in child development and SE to finalize the study. We tested the face and content validity with input from three professional staff in SE programming. The survey was also pilot-tested with information from ten elementary-age students under the agency's research committee protocol to correct unclear contents before its full implementation.

The agency sent invitations to the principals of 587 primary schools in Hong Kong about the purpose of the anonymous survey. All schools had prior parental consent to conduct educational surveys and administered the survey during class time. Each school had a designated teacher or staff member who coordinated the survey distribution and

used the introduction prepared by the agency's research committee to explain the survey purpose and students' voluntary participation. Students could choose not to participate without penalty or skip any questions if they did not have an answer or did not want to answer. This survey also provided a bridge for the respondents to seek help. Its introduction mentioned the agency's mission and provided its "Hugline" (a hotline phone number) for respondents to call for further information or assistance.

This research team received approval from the agency's advisory committee to use this anonymous dataset to analyze factors associated with the timing preference for children. We analyzed the data without the personal identifiers of participants or school names. Our human subject protection application, specifying the hypothesis and a plan to explore the anonymous data, was approved by the Institutional Review Board at the first author's affiliated university.

Measures

The implemented survey had two sections: demographics and SE questions. The first section asked about the child and family characteristics. The second section had five questions: gender differences, attitudes toward SE, internet sex, knowledge perception, and sexual abuse encounters. The knowledge perception question "How much knowledge do you feel you have on sexual health?" asked about having enough sexual health information on a scale from 1 to 4 (1 = *highly insufficient* and 4 = *highly sufficient*). Three items assessed "actual knowledge" through the respondents' perceptions toward sexual myths on a scale from 1 to 4 (4 = *strongly agree*), with a total score ranging from 3 to 12. These three items were (1) Girls will have the ability to give birth after their first menstrual period; (2) Sleeping with the opposite gender will cause pregnancy (reverse scored); and (3) Playing sex games with friends is not wrong (reverse scored). Two questions were fact-based (e.g., menstruation and pregnancy), and one was norm-based (e.g., right or wrong answer about playing sex games). The internal consistency reliability of this three-item scale is low (Cronbach's alpha = .64), with gender differences that girls' responses achieved a higher alpha (.68) than boys' responses (.25). Therefore, we reported these results with bivariate analysis only.

The survey also asked the preteens about instructional and exploratory "informational sources" for obtaining sex-related information. Instructional sources were their mother, father, teachers, textbooks, and school. Exploratory sources were friends, magazines, comics, and the internet. Four questions asked whether the parents talked with the respondents about dating, pregnancy, sexual intercourse, and prevention of child sexual abuse (0 = *no* or 1 = *yes*). The total score of these five items (0–5) estimated the extent of parental involvement (5 = highest).

The dataset contains measures of "early timing" and "openness." Early timing was a four-point scale (from 1 = *strongly disagree* to 4 = *strongly agree*) on an opinion item: *Students should receive formal SE earlier than their current grade in primary school*. Higher scores on this item indicated more positive attitudes toward early timing. "Openness" was a score from five items measuring a student's attitude toward obtaining information about contraceptive methods, STD prevention, dating, and sexual abuse prevention. A 4-point Likert-type scale measured their information-seeking desire from *strongly agree* to *strongly disagree*. The openness score was a 16-point score ranging from 5 to 20 after adding up the scores from these five items. Higher scores on openness indicate more positive attitudes toward improving sexual health knowledge. Its internal consistency reliability is acceptable (Cronbach's alpha = .73). When designing the survey, the staff included questions to explore if the respondents had experienced sexual encounters such as using contraceptives (for sexual intercourse), being sexually touched, and being forced to have sex.

Procedure

SPSS Statistics (Version 28.0) was used for quantitative data analysis. Descriptive statistics, χ^2 , and *t* tests compared knowledge and sources between P5 and P6 students and between boys and girls. A logistic regression model was used to investigate whether students' agreement on early timing could be predicted by openness to SE and sexual knowledge after controlling students' primary caregiver's age and education, family size, and having older siblings.

Results

The agency's staff administered the survey in 24 elementary schools in Hong Kong: 11 from the New Territories, 10 in Kowloon, two from Hong Kong Island, and one from an outer island. In total, 4569 elementary students participated in the study. All respondents could read and write in Chinese. Table 1 summarizes the demographics of these respondents. The respondents comprised 2576 (56.4%) boys and 1974 (43.2%) girls. The sample was closely divided between P5 (2178; 47.7%) and P6 students (2353; 51.5%). The fifth graders were significantly and predictably younger ($M = 10.73$, $SD = .8$) than the sixth graders ($M = 11.70$, $SD = .7$) [$t = 42.24$, $df = 4518$; $p < .001$; Cohen's $d = 1.29$]. Overall, their average age was 11.23 years old, with no significant difference between boys ($M = 11.22$, $SD = .9$) and girls ($M = 11.25$, $SD = .87$) [$t = 1.12$, $df = 4521$; $p = .263$; Cohen's $d = .03$]. More than half of them (2388; 52.3%) were first-born, and almost one-third (1433; 31.6%) were second-born. The majority (3852, 84.3%) were residing in a

Table 1 Demographics of respondents

Variable (<i>N</i> = 4569)	Mean	SD
Age by gender		
Male	11.22	.90
Female	11.25	.87
Age by grade		
P5	10.73	.50
P6	11.70	.50
Male caregiver's age	44.67	6.89
Female caregiver's age	40.11	5.84
Family size	4.25	1.22
Number of siblings	1.96	1.02
	<i>n</i>	%
Gender		
Male	2576	56.38
Female	1974	43.20
Grade level		
P5 (5th grade)	2178	47.67
P6 (6th GRADE)	2353	51.50
Birth order		
1st born	2388	52.27
2nd	1443	31.58
3rd	338	7.40
4th	216	4.73
5th to 12th	184	4.03
Male caregiver's education		
Never attended	26	0.57
Primary school	404	8.84
High school	1914	41.89
College or above	844	18.47
Female caregiver's education		
Never attended	43	0.94
Primary school	416	9.10
High school	2114	46.27
College or above	688	15.06
Living with		
Both parents	3678	80.50
Mom only	341	7.46
Dad only	115	2.52
Relatives	104	2.28
Others	181	3.96

Due to missing responses, some total percentages may not add up to 100%

two-parent household with two siblings, with an average of four family members.

In Hong Kong, dating is typically defined as a girl having a boyfriend or a boy having a girlfriend. At the time of this survey, 91.2% (*n* = 4167) had not started dating, 16.4% (*n* = 749) expressed a desire to start dating, and 6.1% (*n* = 277) were currently dating. In terms of SE at home, most

of these students stated that their parents had not talked with them about sexual intercourse (*n* = 4048; 88.6%), private body parts (*n* = 3422; 74.9%), pregnancy (*n* = 3006; 65.8%), dating (*n* = 2828; 61.9%), or sexual abuse (*n* = 2782; 60.9%).

We explored the data in four areas: knowledge about sexual health, the incongruence between perception and reality, sexual abuse prevention, and openness in learning SE.

Among 4411 students who answered the early timing question, 3580 (81.2%) agreed to receive SE before their current grade in primary school. Therefore, we used logistic regression to report the factors predicting preteens' agreement with the earlier timing of SE.

Finding 1: Insufficient Sexual Health Knowledge

Sexual health knowledge is perceived to be sufficient. Is it true? Yes, about two-thirds of the respondents ($n = 2908$; 64.9%) perceived that they had adequate sexual health knowledge, with no significant difference between boys (65.3%) and girls (64.4%). No, over one-third (35.1%) of them felt knowledge insufficiency, even though almost all of them (96.6%) could name at least one way to obtain sexual health knowledge: more from instructional sources ($M = 2.6$, $SD = 2.9$) than exploratory sources ($M = 0.5$, $SD = 0.7$). Among the various instructional sources, parents were not the first to inform the youth about sexual health. When students had questions about sexual matters, most ($n = 2943$; 66.4%) listed teachers as their primary source of information, followed by books ($n = 2748$, 62%), mothers ($n = 1242$; 28%), friends ($n = 882$; 19.3%), and fathers ($n = 762$; 17.2%). In terms of exploratory sources, some participants learned about sexuality from the internet ($n = 635$; 14.3%), magazines ($n = 310$; 7%), or pornographic

comics ($n = 106$; 2.4%). If given one choice, more than half of them preferred talking with teachers ($n = 2673$; 58.5%) or mothers ($n = 2421$; 53%) rather than other means such as the internet, magazines, or comic books. Based on the sexual health topics they learned from parents, the average parental involvement score was 1.34 (median = 1.00, $SD = 1.50$) on the 0–5 scale. Lower scores indicated that parents were not involved in teaching their children about sexual health topics. This score was also similar to the responses that rated both parents as their primary source of SE ($n = 697$, 15.7%).

Results also found gender differences in sexual health knowledge. Table 2 presents χ^2 findings that girls were significantly more likely than boys to get information from teachers, library books, and mothers. Boys tended to be significantly more likely than girls to get information from friends, pornographic comics, and internet sources. Regarding age differences, P5 students were significantly more likely to get information from mothers, while P6 students had a higher tendency to obtain information from school and friends. Most students (68.5%) stated that they knew the meaning of compensated dating or yuánjiāo (援交), a recent trend in which a young person provides sexual favors over the internet in exchange for money or other gifts. The respondents in this study learned about this type of sexual behavior from television ($n = 1165$; 25.5%), the internet ($n = 987$; 21.6%), and teachers ($n = 978$; 21.4%).

Table 2 Sources of sexual health knowledge: Percentage by grade and gender

Source	Had used	Grade <i>N</i> (%)			Gender <i>N</i> (%)		
		P5	P6	χ^2	Male	Female	χ^2
Teachers	Yes	1403 (66.0)	1528 (66.8)	.38	1587 (63.6)	1356 (70.0)	20.23
	No	724 (34.0)	758 (33.2)	$p = .536$	908 (36.4)	580 (30.0)	$p < .001$
Library Books	Yes	1314 (61.8)	1426 (62.4)	.17	1495 (59.9)	1253 (64.7)	10.77
	No	813 (38.2)	860 (37.6)	$p = .680$	1001 (40.1)	683 (35.3)	$p = .001$
School	Yes	885 (41.6)	1079 (47.2)	13.95	1061 (42.5)	913 (47.2)	9.55
	No	1242 (58.4)	1207 (52.8)	$p < .001$	1435 (57.5)	1023 (52.8)	$p = .002$
Mom	Yes	645 (30.3)	592 (25.9)	10.71	495 (19.8)	747 (38.6)	190.09
	No	1482 (69.7)	1694 (74.1)	$p = .001$	2001 (80.2)	1189 (61.4)	$p < .001$
Dad	Yes	390 (18.3)	369 (16.1)	3.72	418 (16.7)	344 (17.8)	.80
	No	1737 (81.7)	1917 (83.9)	$P = .054$	2078 (83.3)	1592 (82.2)	$p = .371$
Friends	Yes	320 (15.0)	563 (24.6)	63.22	552 (22.1)	332 (17.1)	16.84
	No	1807 (85.0)	1723 (75.4)	$p < .001$	1944 (77.9)	1604 (82.9)	$p < .001$
Internet	Yes	284 (13.4)	350 (15.3)	3.43	359 (14.4)	276 (14.3)	.01
	No	1843 (86.6)	1936 (84.7)	$p = .064$	2137 (85.6)	1660 (85.7)	$p = .905$
Magazines	Yes	144 (6.8)	166 (7.3)	.41	167 (6.7)	143 (7.4)	.81
	No	1983 (93.2)	2120 (92.7)	$p = .523$	2329 (93.3)	1793 (92.6)	$p = .368$
Porno comics	Yes	63 (3.0)	44 (1.9)	5.02	84 (3.4)	22 (1.1)	23.22
	No	2063 (97.0)	2242 (98.1)	$p = .025$	2411 (96.6)	1914 (98.9)	$p < .001$
Internet Chatters	Yes	54 (2.5)	62 (2.7)	.13	85 (3.4)	31 (1.6)	13.94
	No	2072 (97.5)	2224 (97.3)	$p = .721$	2410 (96.6)	1905 (98.4)	$p < .001$

Finding 2: Incongruence Between Perception and Reality

Data also showed an incongruence between perception and reality. Most respondents ($n = 3815$; 83.5%) indicated that they knew what sexual behaviors entailed. However, as presented in Table 3, many disagreed that the following acts were sexual: touching one's private parts ($n = 3395$, 74.3%); kissing on the lips ($n = 2440$; 53.4%); allowing another person to touch one's private parts ($n = 2138$; 46.8%); touching another person's private parts ($n = 1818$; 39.8%); and using one's private parts to touch another person's private parts ($n = 1362$; 29.8%). Girls showed a significantly higher understanding of sexual behaviors than boys did on this subject ($p < .001$) (see results in Table 3).

Findings also addressed the connection between perception and knowledge. Many respondents perceived that sex was a dirty subject ($n = 1973$; 44.1%) with no significant gender differences (43.1% boys and 45.3% girls) [$\chi^2 = 2.17$, $df = 1$, $p = .141$; Cohen's $d = 0.07$]. However, 65.2% of the boys ($n = 1649$) and 64.4% of the girls ($n = 1259$) thought they had sufficient sexual health knowledge, but there were

no significant gender differences related to misconceptions about sexual health. Additionally, 57.8% of boys and 37.1% of girls did not know that a girl could have the ability to give birth after her first menstruation, and 11.1% of boys and 16.8% of girls thought that sleeping with the opposite gender would cause pregnancy. Among the total respondents, 3234 (70.8%) did not perceive anything wrong with playing sex games with friends, a higher percentage of girls (74.3%) than boys (71.1%), but the difference was not statistically significant.

Finding 3: Sexual Behaviors and Abuse

Another finding was related to sexual behaviors and abuse. Although their sexual encounters were self-reported, many students stated that they had the following sexual incidents or behaviors: sexual bullying (873, 19.1%), sexually touched (465, 10.2%), pornographic comics given (444, 9.7%), forced to watch porno movies (217, 4.7%), forced to have sex (50, 1.1%), sexual intercourse (42, 0.9%), condom use (16, 0.3%), and contraceptive pills taken (10, 0.2%). Alarming, the average age of the 50 respondents forced to have sex was

Table 3 Knowledge about sex by respondents' gender

Self-report knowledge ($N = 4569$)	Answer	n (%)		Gender Difference		
		Male	Female	χ^2	p	Cohen's d
Have sufficient sexual knowledge?	Yes	1649 (65.3)	1259 (64.4)	.42	.516	N.S.
	No	875 (34.7)	696 (35.6)			
Sex is a dirty subject to discuss	Yes	1090 (43.1)	883 (45.3)	2.17	.141	N.S.
	No	1439 (56.9)	1066 (54.7)			
Interested to know more about Sexual body parts	Yes	2038 (80.5)	1722 (87.6)	41.54	<.001	0.30
	No	495 (19.5)	243 (12.4)			
Contraceptive methods	Yes	1647 (65.2)	1666 (84.9)	223.06	<.001	0.61
	No	881 (34.8)	296 (15.1)			
STD prevention	Yes	2068 (81.6)	1760 (89.7)	57.68	<.001	0.37
	No	467 (18.4)	202 (10.3)			
Dating and marriage	Yes	1901 (75.0)	1523 (77.5)	3.97	.046	0.08
	No	634 (25.0)	441 (22.5)			
Prevention of sexual abuse	Yes	2327 (91.6)	1895 (96.2)	39.85	<.001	0.47
	No	213 (8.4)	74 (3.8)			
Perception of sex Girls will have the ability to give birth after their first menstruation	Yes	1043 (42.2)	1217 (62.9)	186.32	<.001	0.20
	No	431 (57.8)	719 (37.1)			
^a Sleeping with the opposite gender will cause pregnancy	Yes	278 (11.1)	327 (16.8)	30.45	<.001	0.27
	No	2222 (88.9)	1614 (83.2)			
Playing sex games with friends is nothing wrong	Yes	1793 (71.7)	1441 (74.3)	3.81	.051	N.S.
	No	708 (28.3)	498 (25.7)			

^a“Sleeping with” was used in the survey to mean sleeping (in the Chinese language), not as a colloquial term representing sex or penis–vagina sex

N.S., not significant

11.36 years. Among them, 35 experienced forced vaginal intercourse one or two times, two had forced sex three to five times, and 13 had forced sex more than five times. The agency reported that five students contacted them afterward through their Hugline service. They mentioned that the referral source was the survey and received counseling services regarding their sexual encounters.

Finding 4: Openness to Learn About Sexual Health

In terms of attitudes toward SE, many of the respondents supported “early timing,” which was also significantly correlated with their “openness” ($r = .219, p < .001$; Cramer’s $V = .0002$). In the “timing” variable, most ($n = 3582$; 78.4%) agreed or strongly agreed with the early timing idea, some ($n = 831$; 18.2%) disagreed or strongly disagreed, and a few ($n = 156$; 3.4%) did not answer. Variables such as caregivers’ age and education, family size, having older siblings, or sources of sexual health knowledge were not significantly associated with these preteens’ desire to have SE in their early school years.

Most respondents were open to receiving knowledge about 1) prevention of sexual abuse ($n = 4222$; 92.4%), 2) STD prevention ($n = 3829$; 83.8%), 3) sexual body parts ($n = 3760$; 82.3%), 4) dating and marriage ($n = 3426$; 75%),

and 5) contraceptive methods ($n = 3312$; 72.5%). Out of a possible maximum score of 6, respondents placed their highest interest in five areas: prevention of sexual abuse (5.19), STD prevention (3.99), sexual body parts (3.77), dating and marriage (3.63), and contraceptive methods (3.32).

We conducted bivariate analyses to identify significant differences between genders and grades regarding the students’ perception of early timing and openness to SE. Table 4 shows that the overall average participants agreed on the early timing ($n = 4411$; $M = 3.12$, median = 3.00; $SD = .898$). In terms of gender differences, girls were more receptive ($M = 3.18$) than boys ($M = 3.07$) to receiving SE earlier in primary school ($t = 4.23, df = 4339.15, p < .001$; Cohen’s $d = 0.13$). Both P5 and P6 students agreed with the early timing idea (3.09 vs. 3.15), but the statistics showed no significant difference between the two grades ($p = .054$).

Finding 5: Early Timing

To further study the factors that could predict the respondents’ acceptance of early timing for sexual health learning, we conducted a logistic regression analysis with early timing agreement [0 = Disagree, 1 = Agree] being the dependent variable. Table 5 reported four significant predictors of early timing (Nagelkerke $R^2 = .063, \chi^2 = 169.5, df = 5$,

Table 4 Early timing and openness

Variable	Early timing			Openness		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Grade						
P5	2100	3.09	0.95	2161	13.08	3.45
P6	2292	3.15	0.85	2331	13.21	3.50
	$t = 1.93 (df = 4226.65); p = .054$			$t = 1.17 (df = 4490); p = .243$		
Gender						
Male	2485	3.07	0.95	2541	12.75	3.54
Female	1926	3.18	0.83	1969	13.64	3.33
	$t = 4.23 (df = 4339.15); p < .001$ (Cohen’s $d = 0.13$)			$t = 8.66 (df = 4343.16); p < .001$ (Cohen’s $d = 0.26$)		

Early Timing score (1–4): A higher score indicates a more substantial agreement to an earlier start of sex education; Openness (5–20): A higher score indicates more openness to sexuality education

Table 5 Logistic regression on “early timing” of sexuality education

Variables	<i>B</i>	<i>S.E.</i>	<i>Wald</i>	<i>df</i>	<i>p</i>	<i>Exp(B)</i>
1. Gender	.303	.084	13.089	1	< .001	1.354
2. Number of instructional sources	.274	.051	28.508	1	< .001	1.315
3. Perceived Knowledge (1–4)	.179	.054	10.930	1	< .001	1.196
4. Openness (5–20)	.093	.012	60.683	1	< .001	1.097
5. Age	.088	.046	3.728	1	.053	1.093
Constant	−1.867	.560	11.105	1	< .001	.155

Early timing (0 = Disagree, 1 = Agree); Gender (1 = male, 2 = female); Nagelkerke $R^2 = .063, \chi^2 = 169.5, df = 5, p < .001$

$p < .001$): preteens' gender, number of instructional sources used, perception of having sufficient knowledge, and openness to receive sexual knowledge. Specifically, girls are 35.4% more likely than boys to agree on the early timing of SE (OR = 1.35, $p < .001$). One additional instructional source used by the preteens will increase their agreement to obtain sexual health knowledge in primary school by 31.5% (OR = 1.32, $p < .001$). When they perceive having sufficient understanding by one point on the knowledge perception variable, the likelihood of agreeing with "early timing" will increase by 19.6% (OR = 1.20, $p < .001$). For every one-unit increase in the openness score, there will be a 9.7% increase in agreement to receive SE earlier (OR = 1.10, $p < .001$). These variables explained 6.3% of the response variances.

Discussion

This study indicated that instructional sources, sufficient sexuality knowledge, and openness to sexual health knowledge could predict preteens' desire to receive SE earlier in grade school. Girls were significantly more likely to report their preference to receive SE in an earlier grade. This study has implications for helping preteens express openness and provide input to school-based SE programs.

Previous research supported that comprehensive SE programs can increase health knowledge and reduce sexually risky behaviors for youth without increasing their likelihood of engaging in sexual activities (Tonelli, 2009). To better understand the factors that might influence future sexual behaviors, it is also essential to study children's attributes and experiences by asking sex-related questions, such as their developmental readiness.

When we explored the relationship between openness and early timing, we found the psychology of SE among Chinese preteens from two perspectives. First, these preteens would share their perceptions when asked. This perspective suggests that their open attitude could be encouraged before implementing educational programs. Second, they would express opinions because they thought they knew what SE was. This perspective suggests that their keen learning motivation reflects a need to implement SE earlier than the 5th grade. The fact that these preteens overestimated their perceived knowledge told us that SE delivery in earlier developmental stages might be necessary.

Cultural Stigma of Sexual Health

Traditional cultural beliefs influence an individual's sex perception, attitude, and behavior (Villar & Concha, 2012). Studies indicated that culture significantly impacts how children define gender identity, sexuality, and sex (Blake, 2002; Renold, 2005). As the current study had accessed information

about sexuality and sex from a large sample of young students across many primary schools, the results reported that children had misconceptions about sex and sexuality. Even though they would like to start SE earlier in school, they need a supportive environment conducive to learning (Goldman, 2013). Additionally, SE must address the psychosocial factors affecting young people. For example, gender perception within the Chinese context must be a measure as it is a learning path to healthy sexual development rather than a taboo subject (Ma et al., 2009; Wang et al., 2006, 2007). Similar to moving cultural inclusiveness to normative diversity (Haggis & Mulholland, 2014), this current study supported sexual health education explicitly designed for Chinese children as early as the 1st grade.

Early Timing for Health Promotion as a Strategy

Results show that girls want to learn more about sexual health earlier than boys do. Regarding sexual health sources, boys tend to rely on less accurate sources than girls. Three educational tactics came directly from the respondents. First, it is vital to have transformational learning strategies to address gender differences and discrepancies in self-reported sexual health knowledge and health promotion (Schaalma et al., 2004). When developing SE for primary school students, educators should consider children's gender-specific views on topics such as menstruation and masturbation—one is a health development concept and the other is about one's sexual behavior. Researchers must address barriers due to gender differences to help children feel comfortable asking questions. Second, a closer examination of how youth define sexual well-being is needed to help inform them of sexual abuse prevention, pregnancy and the responsibilities of both partners, and STD prevention. Third, further discussions must focus on the cultural implications of SE at a young age. When working with children and teens, Seiler-Ramadas et al. (2020) emphasize the importance of integrating physical, emotional, and social aspects of sexuality to build trust, alliance, and increased engagement when delivering SE in school-based programs. These preteens also voiced having their parents as a support system to increase their comfort level in sex-related discussions through this survey. Therefore, in addition to school and community-based SE programs, guiding healthy parent–child communication would help students develop a congruent view between what they do not know and what they can ask (Zhang et al., 2007).

Study Limitations

This study had several limitations, mainly due to the use of secondary data provided by the agency with measures for use in designing educational programs. For example, they used the three most common myths among young children

to measure the “actual knowledge” variable. Because of low reliability, our multivariate analysis did not include this knowledge scale. We suggested the agency adopt standardized measures on sexual health knowledge (e.g., Sexuality Questionnaires for Adolescents by Saraçoğlu et al., 2014) for future studies after testing the knowledge items with Chinese preteens. Future studies should include other areas, such as homosexuality, pornography, birth control, and premarital sex.

While the survey reached a sample of P5 and P6 graders from 24 primary schools in Hong Kong, it did not include P1 to P4 students. Another limitation is that unmeasured variables could affect the hypothesized relationship between openness and early timing. For example, if a child has cognitive or emotional development issues, the relationship between “openness” and “early timing” may affect.

The United Nations stated that comprehensive sexuality education (CSE) would adapt its content when development is delayed (UNESCO, 2018). Since we measured the question on early timing with an agreement scale, the data did not contain information on how the students might define early timing in terms of preferred age or school year. Even with attention to gender differences, another limitation was insufficient data on sexual abuse reported by these participants for further statistical analyses. Future studies must address domestic violence issues when delivering sexual health education. Lastly, this study had limited generalizability as more than 500 principals did not respond to the survey invitation. Without these principals’ support, social workers from the agency would not have the opportunity to implement early childhood SE activities in their schools.

Conclusion

This study found that the timing of implementation and student openness to health promotion are essential considerations in designing SE programs suitable for preteens in Hong Kong. Other factors such as caregivers’ age and education, family size, having older siblings, or sources of sexual health knowledge would not significantly predict these preteens’ desire to have SE in their early school years. Since girls turn to teachers and mothers for information while boys turn to internet sources, this study supports delivering an age-appropriate SE curriculum starting earlier than the 5th grade, probably from the 1st grade, on a topic of gender differences as suggested by sex educators (Lumen Learning, 2021).

SE planners have looked into the essential factors to determine success in parent–school–student collaboration but focused on the programming process and outcomes (Andres et al., 2021). It is also necessary to address how children feel and think. In this study, even though the targets were P5 and P6 students, the psychology of their keen learning desire is projected through their high response rate to each survey

question. Since only one question did not address students’ opinions about early learning, further research needs to conceptualize early timing as a starting point that may lead to a journey for students to learn more about sexuality and sexual health. With a curriculum focusing on young children’s desire to learn, primary school students would gradually increase sexual health knowledge based on their developmental needs.

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Data Availability (data transparency) Data analyzed in this study are property of the End Child Sexual Abuse Foundation and cannot be shared with the public unless requested by credible institutions.

Code Availability (software application or custom code) Not applicable.

Declarations

Conflicts of interest The authors declare no conflict of interest, financial or non-financial, in presenting this article for publication.

Ethical approval There was no ethical concern for the research team to use secondary data from an anonymous survey. This study received exempt status from the Institutional Review Board of the University of Houston.

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