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Intentions and attitudes towards parenthood and fertility awareness among Chinese university students in Hong Kong: a comparison with Western samples

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STUDY QUESTION: What are the levels of awareness regarding female fertility and the intentions and attitudes towards parenthood among Chinese university students in Hong Kong compared with their counterparts in the West?

SUMMARY ANSWER: Chinese university students in Hong Kong were similarly over-optimistic about the age-related fertility decline, although they were less inclined to have children and undergo fertility treatment compared with their Western counterparts.

WHAT IS KNOWN ALREADY: Past studies of highly educated young adults in Europe and the USA have found that they are not sufficiently aware of the age-related decline in female fertility, and falsely believe that advanced reproductive treatments such as IVF will overcome fertility problems associated with age. Little is known about the perceptions of Chinese students in Hong Kong, a modernized Chinese city where the fertility rate is among the lowest in the world.

STUDY DESIGN, SIZE, DURATION: An online cross-sectional survey of Chinese university students in Hong Kong was conducted in 2013. Results were compared with two similar studies in Sweden and the USA.

PARTICIPANTS/MATERIALS, SETTING, METHODS: A total of 367 university students in Hong Kong (275 female, 92 male; mean age 23) responded to an e-mail invitation to participate in an online survey. Intentions and attitudes towards parenthood and awareness regarding female fertility were assessed using the Swedish Fertility Awareness Questionnaire.

MAIN RESULTS AND THE ROLE OF CHANCE: Like their Western counterparts, a large proportion of Chinese university students underestimated the age-related fertility decline (92%) and overestimated the fertility treatment success rate (66%). However, they were less inclined to have children, were more aware of and less concerned with infertility and were less motivated to seek solutions in the event of a fertility problem. These comparisons were significant at $P < 0.05$.

LIMITATIONS, REASONS FOR CAUTION: Self-selection bias was inevitable in the questionnaire survey, and the anonymous nature of the survey did not permit the collection of characteristics of non-responders. International comparisons warrant caution because the Hong Kong sample was older than the US sample (mean age 20), but not older than the Sweden sample (mean age 24).

WIDER IMPLICATION OF FINDINGS: While this study was consistent with past Western studies on the lack of fertility awareness among highly educated young people, the findings reveal significant cultural differences in family planning and responses to infertility between Asia and the West.

Key words: fertility awareness / parenting attitudes / infertility / involuntary childlessness / Chinese

Introduction

One of the most significant demographic trends over the past three decades has been the substantial decline in the fertility rate in many areas of the developed world. The world's total fertility rate has declined from 4.5 births per woman in 1970–1975 to 2.5 in 2005–2010 (United Nations Population Division, 2013a). In many countries, the declining fertility rate was accompanied by an improvement in women's education, the increased use of contraception, the rise of delayed marriage and childbearing and the stronger preference for smaller families (United Nations Population Division, 2013b).

Hong Kong is a semi-autonomous city (population: 7.15 million) in China where the state's one-child policy is not enforced. Nonetheless, the total fertility rate in Hong Kong is among the lowest in the world and has steadily fallen from 1.9 in 1981 to 0.9 in 2003, followed by a smaller rebound to 1.3 in 2012 (Hong Kong Government Census and Statistics Department, 2013). For women in the age groups of 20–24 and 25–29, the fertility rates have decreased by 76 and 58%, respectively, over the past 30 years.

The drop in Hong Kong's fertility rate has coincided with several societal trends, including improved education and increased workforce participation for women. (All statistics below cited are from the Hong Kong Government Census and Statistics Department, 2012.) The proportion of Hong Kong women with university education has risen from 2.5% in 1986 to 18.3% in 2012. At the same time, more women of childbearing age are working, with workforce participation rates rising from 71.5% in 1986 to 87.2% in 2012 for the age 25–29 cohort, and from 55.4% to 80.5% for the age 30–34 cohort.

With increased educational and employment opportunities, Hong Kong women are now marrying later and less frequently. The proportion of people aged 20–39 who have never married has increased from 47.4% in 1986 to 58.9% in 2012, while the median age of first marriage has climbed from 23.9 in 1981 to 29.0 in 2012 for women, and from 27.0 to 31.1 for men. As a consequence, the median age of women at first childbirth had also risen steadily: in 2012, the median age of women at first childbirth was 30.5 compared with 25.1 in 1981.

Although delaying childbearing and marriage allows women to pursue educational and career ambitions, advancing age in women is associated with decreased ovarian function and oocyte quality (Hansen, 1986; Schmidt *et al.*, 2012). As a result, older women who want to have children may encounter infertility and resort to assisted reproductive technologies. According to the latest statistics from the Hong Kong Council on Human Reproductive Technology (2013), more than two-thirds (67.6%) of IVF treatment cycles in 2011 were performed on women aged 35 and over. However, not all couples who experience infertility seek treatment: Leong (2002) cited a survey conducted in Hong Kong which found that 16% of 7208 respondents reported fertility issues, but only 34% of those affected had received or had been undergoing fertility treatment at the time of the survey.

Attitudes towards parenthood and fertility awareness among people at reproductive age

Despite evidence that links delayed marriage and late family planning with a higher chance of infertility (Chandra and Stephen, 1998), there is a considerable gap between the availability of medical information on fertility and the actual awareness level of the general public (Hammarberg *et al.*, 2013). Numerous studies have found that people tend to underestimate age-related fertility decline and overestimate the success rate of fertility treatment (Maheshwari *et al.*, 2008; Bretherick *et al.*, 2010; Daniluk *et al.*, 2012; Gossett *et al.*, 2013; MacDougall *et al.*, 2013). One particular group that has received considerable attention is university students, as they have just entered reproductive age and are facing competing interests, between their educational and career goals, marriage and childbearing (Lampic *et al.*, 2006; Svanberg *et al.*, 2006; Tydén *et al.*, 2006; Virtala *et al.*, 2006, 2011; Tough *et al.*, 2007; Bretherick *et al.*, 2010; Rovei *et al.*, 2010; Hashiloni-Dolev *et al.*, 2011; Peterson *et al.*, 2012). In two related studies, young university students in two Western countries were found to underestimate the age-related fertility decline. In a study of students in a Swedish university, Lampic *et al.* (2006) found that they planned to have their children at ages when female fertility has decreased. Similarly, Peterson *et al.* (2012) found that while there was a strong desire for future parenthood among American university students, they showed a lack of fertility awareness and overestimated both the likelihood of pregnancy after unprotected intercourse and the success rate of fertility treatment. Qualitative interviews of Canadian university students revealed similar findings (Sabarre *et al.*, 2013).

In Asia, fertility awareness is considerably less documented. The Starting Families Asia Study (Wong, 2012), which surveyed 1000 women in 10 countries in the Asia Pacific region, revealed that having a stable relationship was particularly important to women in Hong Kong before they felt ready for childbearing, and having a child seemed to be less essential to Hong Kong women overall. The same survey also found that women in Singapore and Hong Kong were the least optimistic about their chances of getting pregnant. However, among Asian women in the survey who had been trying to conceive for >6 months, 62% of them did not suspect the possibility of infertility and 80% of them did not suspect a fertility issue in their husband. Women in Hong Kong showed the least overall knowledge about fertility. For example, only 21% of participants realized that a woman in her 40s has a lower chance of getting pregnant than a woman in her 30s, and only 15% recognized that obesity could reduce fertility. Of respondents in Hong Kong, 62% wrongly believed that a woman who has stopped menstruation could still be fertile. Notwithstanding the rare light this study has shed on fertility awareness in Asia, questions remain: How aware are Chinese university students of the relationship between age and declining fertility in females? What are the factors that affect their family planning? What are the differences between university students in the East and the West regarding fertility awareness?

The current study

To date, most research on fertility awareness has been conducted in Western countries. Hong Kong is an advanced economy (GDP per capita in 2012: US$52 300), where the affinity to Chinese cultural values remains strong, yet where Western lifestyle is also prevalent and Judeo-Christian influence is considerable (Leung and Chan, 2003). Comparing Western countries with Hong Kong may shed light on the possible Chinese cultural influences on attitudes towards fertility, which cannot be explained by socio-economic (such as standard of living, medical access) and political factors (such as the one-child policy). For example, sex remains a taboo topic and open discussion of fertility issues is frowned upon in Hong Kong. Sex education ranges from scant to non-existent for local secondary school students, limiting

their exposure to information such as contraception and fertility from official channels. Despite a high workforce participation rate in Hong Kong among women, there is still a strong cultural expectation that women be the principal childcare provider. At the same time, the use of live-in domestic helpers is widespread among middle class families. Another example is the preference for boys over girls, which is well documented in China due to its patrilineal culture (Lee et al., 2009).

The main aim of the present study was to investigate intentions and attitudes towards parenthood and awareness of fertility issues among Chinese male and female university students. The specific aims were to (i) compare intentions and perceptions between Chinese women and men, and (ii) compare intentions and perceptions of women and men in China with previous results from Sweden (Lampic et al., 2006) and the USA (Peterson et al., 2012).

Materials and Methods

Participants and procedures

Study participants were recruited using open recruitment by bulk e-mail invitations at a university in Hong Kong which had 17 888 students in the 2013/2014 academic year. The e-mails were sent in May 2013 by an automatic mail delivery system at the university, which reached all affiliated institution members including students, staff and alumni.

In the e-mail, a brief description of the study, and a hyperlink to an online survey website that contained an informed consent form and the questionnaire, were included. The online survey was closed in August 2013. As an incentive, participants who completed the questionnaire were entered into a lottery to win one of 20 gift certificates for use at a Hong Kong coffee shop (HK$20 each). The study was approved by the research ethics committee at the University of Hong Kong.

In total, 754 individuals completed the online questionnaire during the 3-month collection period. Since the focus of this study was young university students in Hong Kong, the analysis included only respondents who were full-time or part-time university students and aged 30 or below ($n = 367$).

Measures

The questionnaire in this study was translated into Chinese from the Swedish Fertility Awareness Questionnaire, developed by Lampic et al. (2006) and shown to have satisfactory face validity and reliability; this questionnaire has previously been used by Lampic et al. (2006) and Peterson et al. (2012) in their studies of Swedish and American university students. The translation was conducted by a bilingual researcher (T.H.Y.C.), and was reviewed independently by another bilingual researcher (C.H.Y.C.). In addition to demographic information, the instrument contained five sections: (i) *perceived knowledge of fertility issues* (two items) asked about their perceived level of fertility-related knowledge; (ii) *intention and potential obstacles of marrying and childbearing* (seven items) consisted of yes–no questions and open-response questions aiming to understand the participants' intention to marry and have children, as well as perceived obstacles; (iii) *awareness of fertility issues* (eight items) contained open-response items concerning changes in female fertility with age, and likelihoods of pregnancy and infertility; (iv) *importance of childbearing and intended behaviour in the event of infertility* (four items) consisted of four 0- to 10-point response scales examining their perceived importance of childbearing and their preferred course of action in the event of infertility, and (v) *conditions for parenthood* (13 items) detailed different conditions such as emotional readiness and financial stability that may be important in people's decision to have children. All items could be found in the original Swedish questionnaire (Lampic et al., 2006) or the adapted English version (Peterson et al., 2012), apart from two questions that were revised: a question asking for desired number of children was changed to desired numbers of sons and daughters; and an additional option of 'keep trying natural intercourse' was added to the question probing the intended behaviour in the event of infertility. Two additional questions on the intention of and potential obstacles to marrying were also included. The instrument was pilot tested with two female graduates of the University of Hong Kong. They did not report difficulty in understanding the content and responding to the questions, and their data were not included in the analysis.

Data analyses

For Likert-type items, the Mann–Whitney *U*-tests were conducted to compare responses between men and women. Categorical data were compared using the χ^2 tests. For brevity and clarity, only significant gender differences were reported.

Categorization of open-response answers for items of awareness of fertility issues was modelled after Lampic et al. (2006). Correct answers were determined based on published data (van Noord-Zaadstra et al., 1991; Zinaman et al., 1996; Dunson et al., 2002; Van Voorhis, 2007). In addition, where possible, comparisons with results from Lampic et al. (2006) and Peterson et al. (2012) were done with z (for comparing proportions) and t (for comparing continuous variables) statistics.

Results

Participant characteristics

The characteristics of the participants can be found in Table I. The average age of participants was similar to the Swedish sample ($t = 0.0$, *n.s.*) but was older than the US sample ($t = 16.3$, $P < 0.01$). Female participants accounted for 75% of the sample was female and 58% of participants were single. The vast majority of participants (99%) did not have children.

Compared with the university population, there was a larger proportion (59%) of social sciences students in the sample compared with the university population (20%). The proportion of mainland Chinese students was also larger in the sample (25%) than in the university population (16%). The differences in proportions were significant ($z = 18.5$ and 4.67, respectively, both $P < 0.01$).

Intentions and attitudes towards parenthood

Among participants who were not engaged or married, 65% said that they would like to marry, while 29% reported that they had not thought about it. A small proportion of the participants indicated they would never marry (6%). One in five (20%) indicated that they did not want to have children, a significantly higher proportion compared with both the Swedish (5%) and US samples (10%) ($z = 6.86$ and 2.96, $P < 0.01$).

On a scale of 0–10, all participants were asked to rate the importance of childbearing. An average score of 6.17 (SD = 2.98) was recorded, with the gender difference failing to reach the 0.05 level of significance ($t = 1.47$, *n.s.*). Both men's (mean = 5.77, SD = 2.75) and women's (mean = 6.30, SD = 3.05) scores were significantly lower than their US and Swedish counterparts (men: $t = 6.76$ and 4.97; women: $t = 7.15$ and 7.67; all $P < 0.01$).

Among those who expressed an intention to have a child ($n = 297$), 71% reported that their ideal number of children in their household

Table I Participant characteristics.

	Mean (SD)
Age	23.2 (3.5)
	n (%)
Sex	
Male	92 (25)
Female	275 (75)
Discipline	
Social sciences	218 (59)
Medicine/health sciences	31 (8)
Sciences	30 (8)
Arts	24 (7)
Business/finance/economics	19 (5)
Education	19 (5)
Law	15 (4)
Engineering	11 (3)
Relationship	
Single	214 (58)
Currently having a stable boyfriend/girlfriend	129 (35)
Engaged/married	24 (7)
Number of children	
0	364 (99)
1	2 (1)
2	1 (<1)
Year of study	
1	195 (53)
2	101 (28)
3	52 (14)
4 or above	19 (5)
Place of birth	
Hong Kong	260 (71)
Mainland China	92 (25)
Taiwan	2 (1)
Other	13 (4)

was 2, while 14% indicated 1, and another 14% indicated 3. Men showed a stronger preference for boys over girls (mean desired number of sons: 1.26, SD = 1.22; daughters: 1.03, SD = 1.17; $t = 2.13$, $P < 0.05$), while women showed no significant preference (sons: 1.02, SD = 0.49; daughters: 1.04, SD = 0.46; *n.s.*).

The mean age at which participants desired to have their first child was 29.6 (SD = 3.01) for women and 30.7 (SD = 3.47) for men (Table II). The desire to have their last child was at 34.4 years old (SD = 4.39) for men and at 32.8 (SD = 3.47) for women. Significant gender differences were found in both items ($t = 2.47$ and 2.82, $P < 0.05$). Compared with the US and Swedish samples (Table II), Hong Kong female participants, in general, planned childbearing at a later age, though both men and women expected to have their last child earlier than the Swedish sample. In effect, the expected window of childbearing for Hong Kong respondents was between 3 and 4 years.

Perceived obstacles to and conditions for parenthood

When asked about potential obstacles to parenthood, Hong Kong respondents were concerned with 'not finding the correct partner' (68%), 'pursuit of career aspirations' (49%), 'financial concerns' (39%), 'not feeling emotionally ready' (33%), 'educational pursuit' (17%), 'pursuit of personal interest' (16%) and 'infertility' (3%). All proportions were significantly ($P < 0.01$) lower than the US counterparts except 'not feeling emotionally ready'. Only 3% of respondents said that they were concerned with potential infertility, compared with 25% in the US sample. (No comparable data were reported in the Swedish sample.)

Participants were asked to rate, from 'not important at all' to 'very important' (5 choices), a list of conditions in their decision to have children. Table III summarizes the proportions of participants who rated either 'very important' or 'important' for each condition. Like their Swedish counterparts, Hong Kong respondents considered feeling mature and having a stable partner with whom to share the responsibility as important conditions for childbearing. Notably, Hong Kong men saw having a successful career as a more important factor than women did, a gender difference not observed in the Swedish sample. Access to childcare, financial well-being and living conditions were not as importantly rated by Hong Kong women as by Swedish women. (No comparable data were reported in the US sample.)

Perceived knowledge of fertility issues

More than half (55%) of the respondents stated that they were 'somewhat educated' about fertility issues, followed by 'educated' (38%) and 'highly educated' (6%). Five respondents (1%) reported being 'not educated at all'. Participants said they gained most of their knowledge from the media (46%), school (25%), friends (9%), doctors/gynaecologists (8%), family (7%) and non-government organizations (2%).

Awareness of fertility issues

In a series of open-response questions, participants stated their understanding regarding fertility-related issues (Table IV). On the whole, participants overestimated the age of optimal fertility (69% men, 79% women), and they vastly overestimated the age at which female fertility begins to drop (91% men, 93% women). Although a greater proportion of participants correctly identified the ages at which female fertility markedly declines, 53% of men and 45% of women still overestimated this figure. While participants vastly overestimated the rate of conception with a single unprotected intercourse during ovulation, a surprisingly large proportion of the participants underestimated or correctly estimated the chance of achieving pregnancy over a year of unprotected intercourse. While 55% of women and 42% of men were aware of the prevalence of infertility, 66% of participants overestimated the success rate of fertility treatment. Comparing responses between sexes using *t*-tests, men were more optimistic about the pregnancy rate for women of older age (>35).

The proportions of correct responses from the Hong Kong sample were compared against the US sample and the Swedish sample (details not presented here). On the one hand, Hong Kong women overestimated to a larger extent the age of optimal fertility [Correct response for Hong Kong (HK): 16%; USA: 44%; Sweden (SE): 63%] and early fertility decline (HK: 6%; USA: 18%; SE: 33%), with all showing significant ($P < 0.01$) differences comparing with US and Swedish samples. On

Table II Desired age of childbearing.

	Female			Male		
	HK (n = 223)	US (n = 107)	SE (n = 187)	HK (n = 72)	US (n = 87)	SE (n = 159)
Desired age for first child	29.6 (3.01)	27.4 (4.5)**	28 (2.7)**	30.7 (3.47)	27.9 (5.8)**	30 (2.9)
Desired age for last child	32.8 (3.47)	33.4 (3.6)	35 (3.0)**	34.4 (4.39)	33.4 (7.0)	36 (4.0)**

Significance of t-test comparisons with Hong Kong sample was indicated by ** ($P < 0.01$); HK, Hong Kong; US, USA; SE, Sweden.

Table III Conditions for parenthood.

	Female		Male	
	HK (n = 275)	SE (n = 222)	HK (n = 92)	SE (n = 179)
That I have a partner with whom I can share the responsibility	97	92*	96	93
That I live in a stable relationship	96	93	93	90
That I feel sufficiently mature	93	92	95	90
That my work can be combined with having children	81	71*	87	57**
That I have completed my studies	67	72	71	70
That I want to have children before I am 'too old'	57	54	60	35**
That I/we have a good economy	57	75**	46	57
That I/we have a home that is sufficiently large	50	65**	52	60
That I have had time to travel and do other things that may be difficult to do with children	49	44	37^{+}	46
That I have a permanent position	45	63**	86^{+}	55**
That I have advanced in my profession	36	42	63^{+}	37**
That I have access to childcare	28	67**	28	45*
That my friends have had children or are expecting children	10	4*	9	2*

Significance of two-proportion z-test comparisons with Hong Kong sample of the same gender was indicated by * ($P < 0.05$) and ** ($P < 0.01$), respectively. $^{+}$Significant difference with Hong Kong women ($P < 0.05$). HK, Hong Kong; SE, Sweden.

the other hand, they were on average more accurate about the age of marked fertility decline (HK: 48%; USA: 24%; SE: 36%) and the prevalence of infertility (HK: 55%; USA: 32%; SE: 41%) at a $P < 0.01$ level. The performance of Hong Kong men was in general less accurate than Swedish men but comparable to that of US counterparts; one notable exception was the age of marked fertility decline, with significantly (both $P < 0.01$) more Hong Kong men (37%) being correct than both US (14%) and Swedish (24%) men.

Intended behaviour in the event of infertility

In the event of infertility, participants were asked to indicate the likelihood, from a scale of 0–10, of them pursuing different courses of action. The most likely behaviour was 'keep trying natural intercourse' (mean = 6.49, SD = 3.36), followed by 'choose not to have children' (mean = 5.01, SD = 3.27), then 'adoption' (mean = 4.14, SD = 2.96) and 'IVF' (mean = 4.04, SD = 2.97). Paired t-tests showed significant differences between all combination pairs (ts = 3.61–10.70, $P < 0.01$), except between IVF and adoption (t = 0.52, $n.s.$).

Compared with US and Swedish samples, Hong Kong men and women were significantly more likely to choose to remain childless, and less likely to seek medical treatment or adoption (Table V).

Discussion

The current study found that young university students in Hong Kong overestimated the age of optimal fertility (76%), underestimated fertility decline before the age of 30 (92%) and overestimated pregnancy odds in natural intercourse before the age of 30 (57%). This finding was consistent with their relatively low concern for infertility, and their preference for having their first child at about age 30. Moreover, nearly two-thirds (66%) of the sample believed fertility treatments would be more successful than they actually are, a finding that is consistent with European and American samples (Lampic *et al.*, 2006; Peterson *et al.*, 2012). Those who pursue fertility treatments that are unsuccessful may experience unexpected emotional difficulties as the outcome does not meet their expectations to treatment success.

Comparing the findings from this study to the Western counterparts revealed several distinct characteristics.

Low intention to marry and have a child

More than one-third (35%) of the respondents said they had not thought of marrying or thought they would never marry. One in five (20%) respondents said they did not want to have a child, compared with <5% in Swedish and 10% in US respondents. When asked to rate how

Table IV Awareness of fertility issues among participants.

Items	Categories	Female (n = 275) (%)	Male (n = 92) (%)	P-value
At what age are women most fertile?	15–19	4	2	0.11
	20–24[a]	16	27	
	25–29	63	57	
	30–44	16	12	
At what age is there a slight decrease in women's ability to become pregnant?	15–24	0	1	0.66
	25–29[a]	6	9	
	30–34	52	46	
	35–59	41	45	
At what age is there a marked decrease in women's ability to become pregnant?	25–34	7	10	0.76
	35–39[a]	48	37	
	40–44	36	43	
	45–60	9	10	
A young woman (<25 years) and a man have unprotected intercourse at the time of ovulation—how large is the chance that she will then become pregnant?	0–29%	7	13	0.06
	30–39%[a]	5	9	
	40–49%	2	1	
	50–100%	86	77	
A woman and a man who regularly have unprotected intercourse during a period of 1 year:				
How large is the chance that she will become pregnant if she is 25–30 years old?	0–69%	26	23	0.23
	70–79%[a]	20	10	
	80–89%	31	27	
	90–100%	23	40	
How large is the chance that she will become pregnant if she is 35–40 years old?	0–49%	45	32	0.01
	50–59%[a]	21	14	
	60–69%	19	21	
	70–100%	16	34	
How many couples in Hong Kong are involuntarily childless?	0–4%	3	4	0.30
	5–9%	31	43	
	10–19%[a]	55	42	
	20–90%	12	10	
Couples that undergo treatment with IVF—what is their chance, on average, of having a child?	0–19%	11	7	0.15
	20–29%	9	11	
	30–39%[a]	14	15	
	40–100%	65	67	

[a]The category that contains the correct answer according to the published data.

important childbearing was to them, Hong Kong respondents had significantly lower scores than the Western samples. These findings are in line with the fertility rate in Hong Kong, which is one of the lowest in the world. Low intention to have a child is common in highly urbanized areas, where a demanding lifestyle and competing goals for attaining better education, ensuring financial security and coping with work make childbearing either undesirable, unachievable or unaffordable (Lo, 2003; Dey, 2006). With less legal labour protection and government support than European countries, family-friendly workplace policies are seldom found in companies in Hong Kong, especially small and medium enterprises (Foley *et al.*, 2005). In this study, a vast majority of respondents (83%) named having a job that is compatible with child-raising as one of the conditions for parenthood (compared with 65% of Swedish students), reflecting a common awareness of work–family conflict.

Belief in steep fertility decline

University students in Hong Kong who participated in this survey appeared to subscribe to the notion of a steep fertility decline, which begins at around age 30–35 and ends at around 35–39. The mean number of years between the reported age at which there is a slight decrease in fertility and the reported age at which there is a marked decrease was 5.37 (SD = 2.69). This belief in a relatively steep fertility decline is consistent with the short window (3–4 years) of their

Table V Presumed behaviour in the case of infertility.

	Female			Male		
	HK ($n = 92$)	US ($n = 129–130$)[a]	SE ($n = 212–216$)[a,b]	HK ($n = 275$)	US ($n = 103–104$)[a]	SE ($n = 175–178$)[a,b]
Undergo IVF	3.97 (2.98)	6.0 (3.3)	7.3 (2.8)	4.24 (2.94)	6.4 (2.9)	6.5 (2.8)
Adoption	4.17 (3.00)	7.9 (2.8)	6.5 (2.5)	4.08 (2.90)	6.6 (2.7)	4.9 (2.7)
Choose to be childless	5.17 (3.33)	3.7 (3.2)	2.5 (2.4)	4.51 (3.05)	3.9 (2.3)	3.4 (2.6)
Keep trying natural intercourse	6.61 (3.30)	—	—	6.14 (3.52)	—	—

HK, Hong Kong; US, United States; SE, Sweden.
[a]All scores were significantly different from the Hong Kong scores ($ps < 0.05$).
[b]Scores transformed from a visual analogue scale of 0–100.

desired childbearing age. However, this short timespan may not be compatible with their desired family size, given their competing goals in life or at work. With an underestimation of the early age fertility decline and a less correct belief in advanced age decline, young couples may experience anxiety and frustration in their family planning as they begin their attempts to conceive at a suboptimal age while mindful of the limited time they have.

Inaction in the case of infertility

Although more Hong Kong students, compared with Swedish (Lampic *et al.*, 2006) and US students (Peterson *et al.*, 2012), correctly identified the prevalence of infertility, very few of them said it would be a concern for their own family planning. In the event of infertility, the most likely course of action for the students was inaction, followed by acceptance, adoption and IVF treatment. While students in Sweden and the USA were more likely to pursue adoption or medical treatments in the case of infertility, the fact that Hong Kong students were significantly less inclined to pursue solutions to childlessness is an indication of the stigma related to alternative methods of family building in Chinese culture (Lee *et al.*, 2009). Adoption is not a widely accepted notion as it violates the traditional patriarchal lineage. Similarly, fertility treatment is often associated with shame. Although infertile couples in Hong Kong are eligible for three government-subsidized treatment cycles, there were only 691 IVF treatment cycles per million population in 2011 (Hong Kong Council on Human Reproductive Technology, 2013), compared with 1574 in Australia and 1465 in Scandinavia in 2003 (Chambers *et al.*, 2009). The underutilization of fertility treatment in Hong Kong, and the apparent paradox that Hong Kong students were more aware of infertility prevalence but appeared less concerned with it, can be explained by the cultural taboo of childlessness, which discourages discussion and planning in the event of it (Lee *et al*, 2009).

Lack of formal sex education

A majority of respondents said they obtained sex and fertility-related knowledge from the media instead of school. This reflects the persistent lack of emphasis Hong Kong educators put on sex education. Several studies have noted that sex education for adolescents in Hong Kong promotes abstinence, focuses on knowledge of sexual anatomy and devotes little time on fertility issues (Ng, 1998; Ho and Tsang, 2002). A more detailed survey on sex education in Hong Kong by Fok (2005) found that only 3–17% of secondary schools mentioned birth control and family planning in the first 3 years of the school curriculum, and only one in four teachers surveyed had received >15 h of related training. This results in an incomplete understanding of fertility issues among young people in Hong Kong, who have to seek information in a haphazard way from less official sources such as the mass media and peers.

Gender role in parenting

The current findings also depict a picture of clear gender roles in parenting in Hong Kong, a finding which reflects the traditional family image of a breadwinning husband and a homemaking wife (Lee, 2002). Despite the high female workforce participation, the cultural expectation that women should take up the principal childrearing role is still dominant in Hong Kong. Instead of shifting to gender parity in providing childcare in the rise of dual-earner households, foreign domestic helpers, who make up 3% of the local population and are almost exclusively women, are commonplace in middle class families (Lee, 2002). As a result, access to childcare, an important decision-making factor for Swedish mothers who often continue their work (Lampic *et al.*, 2006), was not perceived as crucial in the Hong Kong community.

Limitations

A major limitation of this study is the self-selection bias, which was inherent in using the convenient sampling method. Thus, the characteristics of non-respondents could not be ascertained, warranting caution when generalizing the results. In addition, the response rate could not be exactly ascertained since the invitation was sent through the automatic mail delivery system of the university. A study using a similar methodology yielded 371 participants from a population of 28 000 students during a 1-month period (Niemz *et al.*, 2005). By comparison, the current study recruited 367 students from a population of 17 888. The study also yielded a larger proportion of respondents from social sciences disciplines relative to the student body. Finally, a significant proportion of respondents were born in China and Taiwan, where different socio-economic environments and government population policies may affect their attitudes.

Conclusion

Notwithstanding these limitations, this is the first known study to examine intentions and attitudes towards parenthood and fertility

awareness in a Chinese sample of university students, and to quantitatively look at the cultural differences between Asian and Western young people with comparable socio-economic backgrounds. The findings of the study underline the need for better sex education in Hong Kong, and the importance of cultural factors when devising fertility and family policies.

Authors' roles

C.H.Y.C., B.D.P. and C.L. conceptualized the study and designed the study materials. C.H.Y.C. and T.H.Y.C. carried out the study. T.H.Y.C. conducted the statistical analysis. C.H.Y.C., T.H.Y.C. and M.Y.J.T. wrote the first draft of the manuscript, while all authors critically reviewed and approved the final version of the manuscript.

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Conflict of interest

None declared.

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