PUBLIC HEALTH RESEARCH

Assessing Nursing Students' Sex Knowledge and Sexual Attitudes: Implications for Primary Health Care

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ABSTRACT

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Introduction Health professionals, especially nurses, in primary care setting are considered most appropriate for providing sexual health care. To provide quality sexual health care, nurses should have adequate sex knowledge and hold positive attitude towards sexuality. However, nurses' perceived inadequate knowledge and negative attitudes towards sexuality were reported to be two major barriers to sexual health care, yet little is known about these barriers among nursing students in Hong Kong. This study was conducted to examine sex knowledge and attitudes towards sexuality among nursing students in Hong Kong.

Methods A cross-sectional study was conducted on the first year nursing students (N= 258) who were recruited to participate via convenience sampling. The General Sexual Knowledge Scale (GSKS) and Attitude towards Sexuality Scale (ATSS) were used to collect data for this study. The data were analysed by descriptive statistics and independent t-test.

Results Sex knowledge was 10.4 ± 3.5 and sexual attitude was 32.9 ± 4.6 indicating nursing students' sex knowledge was poor and their sexual attitudes were neutral. Sex knowledge was positively related to the sexual attitudes ($r = 0.47$, $p < .01$). The attitudes were more liberal in students aged 20 years old or above than students aged 19 or below. Sexual attitudes were also more liberal among students who did not reported religious affiliation than students who did.

Conclusions Knowledge and positive attitudes regarding human sexuality needed to be promoted among nursing students. Findings from this study provided useful information in preparing nursing students to render high quality sexual health care in primary care settings.

Keywords Nursing students - primary care setting - sexual health - sexual attitudes - sexual knowledge.

INTRODUCTION

From a holistic perspective, health refers not only to physical, psychological, and social well-being, but also sexual well-being. Sexual well-being or sexual health is an integral part of reproductive health. However, it is a much more sensitive and controversial issues than reproductive health. In an attempt to reach an international consensus in the definition of sexual health, the World Health Organisation[1] suggested the following definition which has been widely used in many countries.

"Sexual health is a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected, and fulfilled" (p. 4).

The above definition stresses a multidisciplinary approach and is rooted in the health promotion and disease prevention traditions. Thus, sexual health involves providing information, education, counselling, and advice. It is typically a public health and primary health care area which is related to the health promotion, healthy life styles, and prevention.

Sexual health care in primary care settings

Traditionally, sexual health care had been provided in a fragmented way by a wide range of health professionals. Recently, sexual health strategies had identified sexual health as a key activity within the primary care setting. As the first point of entry to the health care system, it was essential that the primary care took a greater responsibility for the sexual health care. The strategy and action plan of the primary sexual health care aimed at improving, protecting, and promoting the sexual health and well-being of people in the community.[2] Specifically, the primary sexual health care contributed to the reduction of incidence of sexually-transmitted infections, the decrease of number of unintended pregnancies including unplanned births to teenage mothers, the provision of appropriate, effective and equitable sexual health information, and to the facilitation of access to sexual health services.[3,4] Sexual health care in the primary care settings can encompass any activity that promote positive sexual health, including the promotion of sex and relationships education; bringing about change in prejudice, stigma and discrimination; and general awareness-raising work. Indeed, sexual health care needed to be clearly placed on the agenda in the primary care setting.

Two major reasons were highlighted in a position paper on the potential role of the primary care setting in the field of sexual health care.[2] First, by integrating sexual health into the primary care, the quality of sexual health would be improved through person-centred approaches (instead of disease-centred approaches) that were particularly needed in this sensitive field of health care. Second, sexual health problems could be dealt with at the primary care level with important savings and without loss of quality of care as many sexual health problems did not necessarily require intervention by highly specialized professionals. It appeared that increasing the capacity of the primary care professionals to provide high quality sexual health care had become an urgent public health priority.

Sexual health care in nursing

Among different health care providers, nurses are more capable to build rapport with patients and gain their trust and confidence. This is because nurses usually keep close contact with patients. Thus, it is easier for them to assess if patients have any sexual concerns because of medical conditions. A study of semi-structured interview was conducted on 35 practice nurses recruited from diverse practices throughout a city (Sheffield) of U.K.[5] It was found that many of them did not proactively address sexual health issues of patients. They tended to shy away from discussion of sex-related topics with patients in primary health care setting where it was identified as the preferred place for treatment of sexual health problems. A study conducted in Spain revealed that a great majority (92%) of the medical and nursing staff of a nephrology department never initiated to address patient's sexual problems.[6] The study showed that many (86%) of them admitted that they did not give sufficient attention to sexual concerns of their patients, though they acknowledged the importance of sexual health in nursing care. The unwillingness of nurses to address sexual issues was apparently incongruent with the claim that sexual health care was a crucial part of high-quality holistic care that nursing staff should offer patients.

Results of studies reported in the middle East and Europe were consistent with the above findings. A study conducted in Turkey[7] revealed that although most nurses (67.3%) felt that they were responsible to deal with sexual problems of patients, a greater proportion of nurses (76.3%) felt uncomfortable talking about sexual issues with their patients. Only 19.4% of them were actually involved in providing sexual health care. The study pointed out that nurses acknowledged their role to deal with patients' sexual problems, but they generally did not do so. A survey study on 100 Swedish registered nurses[8] reported that over 90% of the nurses understood that diseases and treatments might affect patients' sexuality and two-thirds of the nurses agreed that it was their responsibility to encourage patients to talk about their sexual concerns. However, 80% of them did not take time to discuss

patients' sexual concerns, and 60% did not feel confident in their ability to address patients' sexual problems.

Barriers to sexual health care

Studies had been conducted to investigate the barriers to sexual health care. In a qualitative study using phenomenographic method,[9] ten nurses from different care units where they met cancer patients in various phases of trajectory of care were interviewed. The study reported that apart from unsatisfactory communication skills, nurses' inadequate knowledge and negative attitudes were two major barriers to addressing patients' sexual concerns. Research findings from Australia on barriers to sexual history taking in general practice showed that poor sexual knowledge and negative sexual beliefs were major barriers to actively providing sexual health care.[10] The findings were consistent with that reported in Egypt by researchers who conducted a study on nurse's perception of impediments to discussing female sexual issues in nursing practice.[11]

Researchers from Hong Kong and Taiwan reported similar findings. Kong, Wu, and Loke[12] observed that nursing students in Hong Kong were reluctant to take up proactive role in sexual health care, even though they acknowledged their responsibility to attend to patients' sexual concerns. Fewer than half of the participating nursing students considered themselves as capable to talk about sexual health issues or to provide counseling service for patients with sexual health problems. Perceived inadequate knowledge and worries about possible adverse responses of colleagues and patients were two of the important inhibiting factors that deterred nurses' willingness to play an active role in sexual health care. A study on 391 nurses in Taiwan[13] revealed two major facilitators to sexual history taking, i.e., (i) the desire of a nurse to know if patient's sexual history was related to patient's illness; and (ii) when a patient specifically mentioned a sexual problem. On the other hand, three barriers were found to deter nurses to take sexual history: (i) when patients felt embarrassed about sexual issues; (ii) patient's sexuality was unrelated to treatment; and (iii) a lack of professionals for referral of patients for further consultations. Relevantly, nurses also expressed worries that they were not well equipped to resolve patients' problems because of inexperience or lack of sufficient knowledge. In a recent study on 140 senior nursing students from a nursing school at a medical university in central Taiwan,[14] it was found that on a visual analog scale of 0 (minimum) to 10 (maximum), the mean rating of "sexual health care as a nursing role" was 7.9±1.9, but the rating on "willingness to provide sexual health care" was much lower, with a mean of only 4.6±2.4. The authors concluded that though nursing students recognised their role in sexuality-related health care, their preparation and willingness to address sexual problems of patients were limited. In general, nursing students felt subjectively that they had not been adequately trained to provide sexual health care, both in terms of their sexual knowledge and attitudes towards sexuality. However, there was no study conducted in Hong Kong to objectively evaluate the actual level of nursing students' sex knowledge and sexual attitudes with measures of satisfactory reliability and validity.

Relationship of sexual knowledge and sexual attitudes

Thus far, empirical research suggested that the relationship between sexual knowledge and sexual attitudes had not been the main focus of research in the medial or nursing field. Findings on the relationship were reported as part of the results of data analysis and it was suggested that sexual knowledge was positively related to sexual attitudes. For examples, in a study conducted in Western Australia,[15] medical and nursing students (N=576) who were lower in sex knowledge tended to expressed negative attitudes towards LGBT, premarital and extramarital sex, contraception, abortion, and child-bearing by unmarried women. Data on a sample of Iranian unmarried girls (N=165) showed that higher levels of sexual knowledge was associated more liberal attitudes towards sexuality.[16] Similar observation was reported among university students in Malaysia[17] and nursing students in Taiwan.[18] The relationship between knowledge and attitudes of nursing students in Hong Kong has yet to be empirically examined.

Effects of sociodemographic characteristics

Similar to the relationship between sex knowledge and sexual attitudes, effect of sociodemographic characteristics was rarely a focus in the research literature. Many studies included sociodemographic characteristics as part of the data analysis. Although findings in this regard were not perfectly consistent, males in general tended to have better sexual knowledge and hold more permissive sexual attitudes than did females.[19] The same tendency was observed among those who were older in age[20,21] and of higher education.[22] Individuals high in religiosity or those who reported religious affiliation were poorer in sexual knowledge and more conservative in sexual attitudes.[15] Whether or not the above findings are applicable to nursing students in Hong Kong needs to be investigated.

Objectives of this study

Adequate sex knowledge and positive attitudes are importance elements in providing quality sexual health service. However, there is lack of empirical study to evaluate these aspects of nursing students in Hong Kong. This study was conducted to examine

the actual levels sex knowledge and attitudes towards sexuality among nursing students in Hong Kong. It also examined the relationship between sexual knowledge and sexual attitudes and looked into how these two aspects were associated with sociodemographic characteristics.

METHODS

Design and Samples

This was a descriptive cross-sectional study. Participants of this study were all first year nursing students attending a General Education (GE) course of Applied Psychology. A total of 258 nursing students participated in this study. Referring to the statistical table published by Cohen (1992, p. 158),[23] a sample size of 128 was required for two-sample independent t-test or one-way ANOVA, with $p < .05$, medium effect size of .50, and statistical power of .80. Apparently, our sample size of 258 was adequate for the data analysis performed in this study.

Participants of this study were pursuing a course of study leading to a Higher Diploma in Nursing offered by the School of Nursing under the jurisdiction of the Hong Kong Hospital Authority. They were selected using the convenience sampling. All participants fulfilled the study criteria of enrollment as full-time nursing students and had not previously participated in similar studies. Final year students or nursing students of private institutes were not included in the present study.

Measuring Instruments

A questionnaire was designed to collect data for this study. The questionnaire consisted of two sections. Section I elicited data on sociodemographic characteristics (Age, gender, marital status, and religion). Section II contained measuring instruments of General Sexual Knowledge Scale (GSKS) and the Attitude towards Sexuality Scale (ATSS).

The GSKS originally developed by HKASERT (2010)[24] was used to measure sex knowledge of nursing students. It consisted of 19 items on knowledge of pregnancy, contraception, masturbation, male and female sexual function, sexually transmitted diseases, etc. Respondents were asked to answer each item by indicating "true", "false"', or "don't know". The "don't know" choice was added in order to reduce respondents' tendency towards guessing. Each correct answer was assigned one point, whereas "don't know" and incorrect answers were scored zero. All points were summed up to represent level of sex knowledge of the respondents (minimum = 0, maximum = 19), with higher scores indicated higher level of knowledge.

The ATSS which consisted of 13 items was developed by Fisher and Hall to measure general attitudes towards human sexuality.[25] The scale included different issues of sexuality, e.g., abortion, contraception, homosexuality, prostitution, premarital sex, sex-transmitted diseases, etc. A 4-point Likert response format (1 = strongly disagree, 4 = strongly agree; with 2.5 as the neutral midpoint) was used to assess respondents' sexual attitudes. Possible scores ranged from 13 to 52. Higher scores indicated liberal attitudes towards human sexuality in general. The conceptual midpoint of the total score was 32.5 [i.e., 2.5 x 13 (midpoint x no. of items)].

A pilot study on ten nursing students confirmed that items of the questionnaire were readily understandable and it was feasible to use the questionnaire for data collection. Reliability and validity of the Chinese GSKS and ATSS when applied to nursing students were established in a separate study.[26] The study confirmed that the reliability of GSKS and ATSS was satisfactory (with Cronbach α =.75 and .77 respectively). Both the GSKS and ATSS were of temporal stability. The test-retest reliability of GSKS and ATSS were .80 and .82 respectively. As predicted, moderate relationships were found between GSKS and knowledge of elderly sexuality ($r=0.47$, $p< .01$); and between ATSS and attitudes towards elderly sexuality ($r=0.45$, $p< .01$). The moderate relationships provided empirical evidence for the convergent validity of GSKS and ATSS.

Data collection procedure

Informed consent was solicited before the questionnaires were administered for data collection. Data collection was completed in end of April, 2016. The present study did not involve any data collection of physiological specimens of the participants. Its data collection procedure fulfilled the requirement of the Ethic and Research Committee of the Institute with which the authors of this study were affiliated. The continuing course assessment was also officially approved by the Hospital Authority of the Hong Kong Government. Nursing students filled in the questionnaire in class. The questionnaire took around 15 minutes to complete.

Statistical analysis

Data were analyzed using the IBM SPSS version 22.0, and the level statistical significance was set at $p< .05$. Sociodemographic characteristics, sexual knowledge, and sexual attitudes of nursing students were presented by descriptive statistics in terms of percentage, mean, and standard deviation. Data on sex knowledge and sexual attitudes were not significantly deviated from a normal distribution, Pearson correlation was used to examine the relationship between the two variables. Independent t-test was used to assess if students' sexual knowledge and sexual attitudes could be differentiated by their sociodemographic characteristics.

RESULTS

Sociodemographic Characteristics

The age of the participants (N = 258) ranged from 18 to 23 years old (19.3 ± 1.7). For data analysis, age was divided into two groups; 19 or below vs. 20 or above, with the younger group consisted of 65.5% of the sample. In general, the great majority of them were females (90.7%) and never married (99.6%). More than half of them (68.9%) reported no religious affiliations.

Sexual knowledge and sexual attitudes of nursing students

The mean score on 19-item GSKS was 10.4±3.5, that is, slightly more than half (54.7%) of the knowledge items were answered correctly. However, using 10 of the 19 items answered correctly as the cutoff point, more than two-fifths (41.4 %) of the students would have failed the test. The percentage of students who gave correct answer to each item of the GSKS is shown in Table 1. Items in Table 1 are arranged in descending order of percentage of students giving correct answer.

Table 1 Percentage of Nursing Students' Responses to Items of General Sexual Knowledge Scale

Item No.	Content of item	True	False	Don't know
16	A person may not know that he/she is infected by STDs (T)	93.4	1.9	4.7
13	The use condoms reduces the spread of STDs or AIDS (T)	91.1	5.8	3.1
18	Women who do not have orgasm during sexual intercourse will not become pregnant (F)	0.0	85.3	14.7
19	Sexually transmitted diseases only damage sexual organ (F)	3.9	80.6	15.5
11	Using two condoms is more effective than using one condom (F)	7.8	77.8	14.4
9	The possibility of woman's pregnancy at first time intercourse is extremely low(F)	0.8	75.1	24.1
17	Quickly extract penis and ejaculate in vitro can avoid pregnancy (F)	12.0	68.6	19.4
15	Adults who masturbate is unhealthy (F)	5.4	67.4	27.1
12	Women will not become pregnant during menstruation or 1-2 days before or after menstruation. (F)	26.3	56.9	16.9
6	Length of penis determines male's sexual ability (F)	9.8	53.9	36.3
14	In sexual activity, as long as no sexual intercourse would reduce the likelihood of getting STDs or AIDS (F)	26.4	52.3	21.3
1	Only vaginal intercourse can be considered as sexual relationship (F)	35.8	51.0	13.2
3	Masturbation is not good for one's health (F)	16.7	44.0	39.3
5	Women are still interested in sexual activity after menopause (T)	33.5	5.4	61.1
4	Children aged under five may also masturbate (T)	32.0	16.0	52.0
2	Caressing, hugging, and kissing are not sexual behaviors (F)	65.4	24.1	10.5
7	premature ejaculation is a manifestation of sexual incompetence (F)	37.0	21.8	41.2
10	The best sexual intercourse must have an orgasm (F)	32.3	18.5	49.2
8	Ejaculation will always have orgasm (F)	43.2	15.6	41.2

Note. Figures in bold print represent percentage of students giving correct answer. (T) = True; (F) = False.

The mean score on ATSS was 32.9±4.6. On a 4-point rating scale, the scale value of 2.5 was the conceptual midpoint which indicated neutral attitudes. The scale value of the mean score was 2.53, which was obtained from dividing the mean score (i.e., 32.9) by the number of items of the scale (i.e., 13). The scale of the mean score (2.53) showed that nursing students generally held neutral attitudes towards human sexuality. Nursing students' attitudes towards each item of ATTS is shown in Table 2. As can be seen in Table 2, half of the nursing students agreed that sex be confined to marital relationship only (Item 13), while the other half disagreed with it. With regard to the rest of the 12 items, nursing students exhibited liberal attitudes towards half of the items, and showed restrictive attitudes towards the other half.

Items in Table 2 are arranged in the order of the positive attitudes expressed by nursing students, i.e., the top 6 items were associated with liberal attitudes; whereas the bottom 6 items, restrictive attitudes. The data analysis also revealed that students' sex knowledge was positively related to their sexual attitudes, with $r = 0.47$ ($p < .01$).

Table 2 Percentage of Nursing Students' Response to Items of *Attitudes towards Sexuality Scale*

Item No	Content of item	SD/D	SA/A
3	Information about contraception should be given to any individual who intends to have sex intercourse	5.1	94.9
10	Homosexual behavior is an acceptable variation in sexual preference	17.3	82.7
12	A person's sexual behavior is his/her own business and nobody should make value judgment about it	20.7	79.3
11	A person who catches a venereal disease is probably getting what she/he deserves (-)	77.9	22.1
7	Petting is immoral behavior unless couples are marrieds (-)	66.3	33.7
8	Premarital sex intercourse for young people is unacceptable to me (-)	55.9	44.1
13	Sexual intercourse should only occur between two people who are married to each other (-)	50.0	50.0
9	Sexual intercourse for unmarried young people is acceptable without affection existing if both partners agree	52.2	47.8
1	Nudist camp should be made completely illegal (-)	45.0	55.0
4	Parents should be informed if their children under the age of 18 have visited a clinic to obtain contraceptive device (-)	37.0	63.0
2	Abortion should be made available when a woman feels it be the best decision	69.7	30.2
5	Our government should try harder to prevent the distribution pornography (-)	29.9	70.1
6	Prostitution should be legalized	84.0	16.0

Note. Item with (-) are reverse scored. SD/D = Strongly Disagree or Disagree; SA/A = Strongly Agree or Agree. Figures in bold print represent percentage of students holding liberal attitudes

Association of demographic factors

As shown in Table 3, the sex knowledge was not significantly related to any of the sociodemographic characteristics. In contrast, the sexual attitude had significant relationship with age and religion. In particular, older age group students had more liberal sexual attitude than the younger group (t = 4.42, p = .000). More liberal sexual attitude was also seen in nursing students who reported no religious affiliation than those who were affiliated with a religion (t = 4.30, p = .000).

Table 3 Sociodemographic Factors in Sexual knowledge and Sexual Attitudes

Characteristics		M ± SD	*t-value* (256)[a]	*p*-value
		Sexual Knowledge		
Gender:	Female	10.8 ± 3.8		.823
	Male	11.0 ± 3.7	0.22	
Age:	19 or below	10.6 ± 4.0		
	20 or above	11.3 ± 3.1	1.33	.183
Religion:	Yes	10.9 ± 3.7		
	No	10.7 ± 3.8	0.46	.647
		Sexual Attitudes		
Gender:	Female	32.1 ± 4.7	1.62	.107
	Male	34.8 ± 4.3		
Age:	19 or below	32.0 ± 4.7	4.42***	.000
	20 or above	34.9 ± 4.3		
Religion:	Yes	31.0 ± 5.4	4.30***	.000
	No	33.8 ± 4.2		

[a]*Degree of freedom varied slightly because of missing data; ***p < .001*

DISCUSSION

Sex Knowledge and sexual attitudes of nursing students

In general, nursing students showed poor sex knowledge and they generally did not hold positive attitudes regarding human sexuality. Thus, findings reported in previous research[10, 11] were valid reflection of the situations of first year nursing students in Hong Kong. Certainly, to be well prepared for quality sexual health care in primary care settings, one would expect nursing students to have sound sexual knowledge and to hold positive and nonjudgmental attitudes towards sexuality. Hence, nursing training to promote their knowledge

and attitudes was indicated. Data gathered from this study on nursing students' response to each item of the GSKS and ATSS should provide useful information to expedite nursing training with respect to sexual knowledge and sexual attitudes. The descriptive statistics on items of sex knowledge and sexual attitudes showed specifically the topics on which nursing students need to make improvement. These empirical data would be useful in facilitating the dissemination of correct knowledge and the promotion of positive attitudes among nursing students. Consequently, nursing students would be better prepared to provide professional sexual health care in primary care settings.

Upgrading sexual knowledge and sexual positive attitudes would better prepare nursing students to render high quality sexual health care. Additionally, it would also enhance students' self-efficacy in dealing with patients' sexual issues.[18] Feelings of competence and self-efficacy at work might led to job satisfaction and a sense of psychological well-being. Indeed, the training was beneficial to nursing students themselves. Better sexual knowledge should help nursing students to avoid unsafe sexual activities, which in a way protected sexual health. Paradoxically, the acquisition of more liberal or permissive sexual attitudes might result in greater openness in sexuality, which would increase the probability of engaging in risky sexual behavior. Sex educators should therefore forewarn their students about the hazards involved in risky sexual behavior and the safety measures that needed to be taken for protection of students' sexual health.

Although nursing staff with more liberal sexual attitudes would feel easier and more comfortable to discuss sexual issues with patients,[8] sex educators were expected to respect students who did not hold liberal sexual attitudes. The training may aim at adopting more nonjudgmental sexual attitudes in addressing patients' sexual concerns in primary health care settings. As importantly, perhaps training should also focus on resolving embarrassment feelings through role playing and practice of sexual history taking.

It needed to point out that to conclude that nursing students of our study were holding neutral attitudes towards sexuality should be considered it a general statement. This was because nursing students were actually liberal towards almost half of the items and were negative towards the other half. Training might address items on which nursing students expressed negative attitudes. In conducting training for nursing students, a pre-assessment was strongly recommended. The pre-assessment not only would serve as a baseline for further comparison, it might also serve as a "priming device" to orientate students that sexuality was a part of the curriculum in nursing education. It had been reported that a test of sexual knowledge and attitudes in the beginning of nursing training would have a relatively long term positive effect on nursing students' sexual knowledge and sexual attitudes.[27]

Relationship of sexual knowledge and sexual attitudes

Results of this study demonstrated a positive relationship between sexual knowledge and sexual attitudes. The positive relationship was consistent with the findings reported on senior nursing students by Sung, Huang, and Lin[16] who demonstrated a significant positive relationship between knowledge and attitudes regarding sexual health care. Similar findings were reported in a study conducted among Malaysian university students.[17] At the end of a semester course of sexuality, students (including Malay, Chinese, and Indian) who scored higher on a sexual knowledge scale expressed more liberal and positive attitudes towards masturbation and heterosexual relations. They also exhibited a stronger tendency to reject traditionally held sexual beliefs. The findings showed that an increase of sexual knowledge resulted in liberal attitudes towards issues of sexuality. Causal relationship between sexual knowledge and sexual attitudes was also demonstrated by Weis, Rabinowitz, and Ruckstuhl[28] who confirmed that an upgrading of sexual knowledge of college students via a semester sex education course brought about more positive attitudes towards human sexuality. Results of our study were congruent with the above findings. However, causal relationship between knowledge and attitudes could not be inferred from results of the present study in which a cross-sectional and correlational method was adopted. Perhaps, the observed relationship might be considered bi-directional in accord with the principle of reciprocal determinism of human behaviour.

The role of sociodemographic factors

Data of this study showed that sex knowledge was not significantly associated gender, age, or religion affiliation. On the other hand, liberal sexual attitudes significantly related to older age and no religious affiliation. Apparently, sociodemographic factors played a greater role in sexual attitudes than sexual knowledge. The properties of sexual attitudes may perhaps account for the difference. As commonly recognised, attitudes tended to merge into an interrelated network of tradition, beliefs, and values. Furthermore, traditional belief, custom, or cohort characteristics were associated with attitudes more than with objective knowledge.[29] We speculated that sexual attitudes were more likely than sexual knowledge to be associated with such a network of belief and cohort characteristics, which might perhaps account for the differential relationships of sexual attitudes and sexual knowledge with sociodemographic factors.

Our findings indicated that older age was marginally associated better sexual knowledge and significantly related to positive sexual attitudes. The positive relationships were unlikely to be confounded by level of education because participants of this study were all first year nursing students. Research in the field reported consistently that among adolescents and younger adults, older age was correlated with higher levels of knowledge and permissive sexual attitudes.[20] A review of studies on teenage in China also reported that older students tended to hold more permissive attitudes towards sexuality.[21] Perhaps, by virtue of greater life experience and exposure to more varied life-styles, older students might have more sexual knowledge and hold more permissive sexual attitudes.

Regarding the effect of gender, the data showed that female nursing students tended to hold sexual attitudes more restrictive than that of male students, though the difference was only proximate the marginal significance level. It could not be excluded that the small sample size of male students might decrease the statistical power in detecting significant gender difference. At any rate, the finding was consistent with the results reported from three Asian cities (viz., Hanoi, Shanghai, and Taipei)[22] where girls held more conservative sexual attitudes than did boys. Our results were also congruent with that reported in Western culture[15,19] where female nursing students were more conservative in sexual attitudes than were male nursing students. Apparently, in many cultures of the world, double standard of sexuality prevailed. The double standard entailed more permissive attitudes for boys and men. It even praised for heterosexual sexual contacts of boys and men, whereas girls and women were derogated and stigmatized for similar behaviors. For instance, it was found that greater numbers of sexual partners were positively correlated with boys' peer acceptance, but negatively correlated with girls' peer acceptance.[30] Hong Kong is also a city where the double standard of sexuality predominates. The Chinese traditional values impose greater sexual restriction on females than on males. The tendency of female nursing students being more conservative in sexual attitudes than their male counterparts could be a reflection of such double standard.

Because of the small sample size of different religious affiliations, comparison was made between students who reported religious affiliation and those who did not. The data indicated clearly that nursing students with religious affiliation were more restrictive in sexual attitudes. This finding was consistent with a study conducted in France reporting religious beliefs were associated with less permissive sexual attitudes even when the effect of age was controlled for.[31] Our findings on religious affiliation were also compatible with studies investigating the effects of religion on sexual attitudes.[15] Historically, there had been a tendency of religion to repress sexual expression and to proscribe engaging in sexual activities solely for pleasure. The association of religious affiliation and restrictive sexual attitudes among nursing students was likely a reflection of this historical tradition.

LIMITATION OF THE STUDY

Confirmation of the relationship between sexual knowledge and sexual attitudes and demonstration of the well-established effect of age and religious affiliation on sexual attitudes provided additional evidence for the construct validity of the measuring instruments adopted in this study. However, the design of this study was cross-sectional, which had some limitations that was worthy of note. For instance, our results showed that older nursing students were significantly more liberal in attitudes towards human sexuality. Yet the findings might not be taken as a life course changes. Longitudinal studies are needed to disentangle the real-time age trajectories of knowledge and attitudes among the nursing students.

It should also be noted that nursing students of this study were recruited via convenience sampling. While the sampling method was a common method for exploratory study in view of its ease of use and availability of data, it might impose certain limits on the generalisation of the findings. Data collected through population-based sampling would allow for better generalisation of findings.

Participants of this study constituted a homogenous sample of first year nursing students, with 99.6% never married and 90.7% females. The sample characteristics precluded analysis of the effect of education level and marital status on sexual knowledge and sexual attitudes. Furthermore, the great majority of female students of the sample also limited the generalisation of findings to male nursing students. Tsai observed that nurses who were of higher education or with more clinical experience perceived fewer impediments to taking sexual history (13). Future studies may consider recruiting students with a broader spectrum of sociodemographic characteristics so that the effects of educational levels, clinical experiences, and other sociodemographic factors could be specifically examined.

Finally, it should be noted that sexuality is still a taboo topic in Hong Kong where the traditional cultures tends to impose a restrictive standard on females. Our female participants might respond to the questionnaire in a socially desirable manner, which would unduly affect the results of the study. Because of space constraints, the questionnaire did not include any measure of social desirability and hence the effect of social desirability could not be statistically controlled for. Attempt had been made to reduce the effect via anonymous participation. However, to what extent the effect

would thus be circumscribed could not be feasibly evaluated.

CONCLUSION

Nursing students in Hong Kong did show a rather low level of sex knowledge and did not exhibit positive attitudes towards human sexuality. Enhancement of sexual knowledge and positive attitudes towards human sexuality was indicated. In order to provide quality sexual health care in primary care settings, nursing students should be equipped with professional knowledge and positive and nonjudgmental attitudes regarding human sexuality. Data gathered in this study provided useful reference information to expedite training of nursing students for primary sexual health care. Relevant training was desirable because inadequate sexual knowledge or negative views of human sexuality not only would impede the quality of primary care services, it would also lead to an increase of tension and anxiety among the nursing staff.[32] More detrimentally, it would bring about an unhealthy view in clients who used primary health care services. Kass coined the term "geriatric sexuality breakdown syndrome" to refer to older adults' introjection of the negative sexual attitudes of others as proper. Thus, older adults suppressed their sexual needs because they took it from others that sexual expression was inappropriate.[33] It is not unlikely that clients other than elderly patients would also pick up negative attitudes of nursing staff at primary care setting and suppress their sexual needs which may deleteriously affect their quality of life. While providing quality sexual health care has become an urgent public health priority, equipping nursing students with sound professional sexual knowledge and positive attitudes towards sexuality also demands immediate attention.

REFERENCES

1. World Health Organisation (WHO). Defining sexual health: Report of a technical consultation on sexual health, 28 to 31 January 2002. Geneva: WHO; 2006.
2. Ketting E, Esin A. Integrating sexual and reproductive health in primary health care in Europe: position paper of the European Forum for Primary Care. Qual Prim Care. 2010; 18: 269-282.
3. World Health Organisation (WHO). Sexual and reproductive health – Core competencies in primary care. Geneva: WHO; 2011.
4. United Nations Population Fund (UNFPA). Sexual and reproductive for all. New York: UNFPA; 2010.
5. Gott M, Galena E, Hinchilff S, Elford H. Opening a can of worms: GP and practice nurse barrier to talking about sexual health in primary care. Fam Pract. 2004; 21(5): 528-36. doi: 10.1093/fampra/cmh509.
6. Ho T, Fernandzo M. Patient's sexual health: Do we care enough? J Renal Care. 2006; 32(4): 183-6. doi: 10.1111/j.1755-6686.2006.tb00019.x/epdf.
7. Demirgöz BM. The nurse's attitudes and beliefs towards sexuality. HEAD. 2014; 11: 38-42.
8. Saunamaki N, Andersson M. Engström M. Discussing sexuality with patients: Nurses' attitudes and belief. J Adv Nurs. 2010; 66(6): 1308-1316.doi: 10.1111/j.1365-2648.2010.05260.x.
9. Olsson C, Berglund AL, Larsson M. Patient's Sexuality – a neglected area of cancer nursing? Eur J Oncol Nurs. 2012; 16(4): 426-431. doi: 10.1016/j.ejon.2011.10.003.
10. Temple-Smith M, Hammond JM, Pyett P, Presswell N. Barriers to sexual history taking in general practice. Aust Fam Physician. 1996; 25(9): 71-74.
11. Mahmoud AM, Fawaz MA. Nurse's perception of barriers toward discussing female sexual issues in nursing practice. Med J Cairo University 2015; 83(2): 221-230.
12. Kong SKF, Wu LH, Loke AY. Nursing students' knowledge, attitude and readiness to work for clients with sexual health concerns. J Clin Nurs. 2009; 18(16): 2372-82. doi: 10.1111/j.1365-2702.2008.02756.x.
13. Tsai YF. Nurses' facilitators and barriers for taking a sexual history in Taiwan. Appl Nur Res. 2004; 17(4): 257-264. doi: 10.1016/j.apnr.2004.09.011.
14. Tsai LY, Huang CY, Liao WC, Tseng TH, Lai TJ. Assessing student nurses' learning needs for addressing patients' sexual health concerns in Taiwan. Nurs Educ Today. 2013; 33(2): 152-159. doi: 10.1016/j.nedt.2012.05.014.
15. McKelvey RS, Webb JA, Baldassar LV, Robinson SM, Riley G. Sex knowledge and sexual attitude among medical and nursing Students. Aust NZ J Psychiat. 1999; 33(2): 260-266. doi: 10.1046/j.1440-1614.1999.00549.x.
16. Bagheersad Z, Fahami F, Beigi M, Hasanzadeh A. Sexual knowledge and attitude among girls who are getting married based on the information from yas pre-marriage counselling center. Iranian J Nurs Midwifery Res. 2017; 22: 255-256.
17. Low WY. Impact of sexual health course on Malaysian university students. Med J Malaysia. 2004; 59(4): 443-449.

18. Sung SC, Huang, HI, Lin MH. Relationship between the knowledge, attitude, and self-efficacy on sexual health care for nursing students. J Prof Nurs. 2015; 31(3): 254-261. doi: 10.1016/j.profnurs.2014.11.001.
19. Papaharitou E, Nakopoulou M, Moraitou Z, Tsimtsiou E, Konstantinidou D. Exploring sexual attitudes of students in health Professions. J Sex Med. 2008; 5(6): 1308-1316. doi: 10.1111/j.1743-6109.2008.00826.x.
20. Tobey J, Hillman SB, Anagurthi C, Somers CL. Demographic differences in adolescents' sexual attitudes and behaviours, parent communication about sex, and school sex education. Electronic J Hum Sex. 2011; 14: 1-8.
21. Yu J. Teenage sexual attitudes and behaviour in China. Health Soc Care Community. 2012; 20(6): 561-582. doi: 10.1111/j.1365-2524.2011.01054.x.
22. Zuo X, Lou C, Gao E, Cheng Y, Niu H, Laurie SZ. Gender differences in adolescent premarital sexual permissiveness in three Asian cities: Effects of gender-role attitudes. J Adol Health. 2012; 50 (3): 18-25. doi: 10.1016/j.jadohealth.2011.12.001.
23. Cohen J. A power primer. Psychol Bull. 1992; 112 (1): 155-159. doi: 10.1037/0033-2909.112.1.155.
24. Hong Kong Association of Sexuality Educators, Researchers and Therapists (HKASERT). Sex Knowledge of Hong Kong People. Hong Kong: HKASERT; 2010.
25. Fisher TD, Hall RG. A scale for the comparison of the sexual attitudes of adolescents and their parents. J Sex Res. 1988; 24(1): 90-100. doi: 10.1080/00224498809551400.
26. Ng, H.N., & Boey, K.W. Brief sex education programme promoting sexual knowledge and sexual attitudes among nursing students. Presented at the First Symposium of Sexual Counselling and Sexual Education in Hong Kong (12-13 October), The Hong Kong Professional Counselling and Psychology Association, Hong Kong; 2018.
27. Frazer J, Albert M, Smith J, Dearber J. Impact of a human sexuality workshop on sexual attitudes and knowledge of nursing students. J Nurs Educ. 1982; 21(3): 6-13.
28. Weis DL, Rabinowitz B, Ruckstuhl MF. Individual changes in sexual attitudes and behavior within college-level human sexuality courses. J Sex Res. 1992; 29(1): 43-59. doi: 10.1080/00224499209551633.
29. Eagly AH, Chaiken S. The psychology of attitudes. Fort Worth, TX: Harcourt Brace Jovanovich; 1993.
30. Kreager DA, Staff J. The sexual double standard and adolescent peer acceptance. Soc Psychol Quart. 2009; 72(2): 143-164. doi: 10.1177/019027250907200205.
31. Gall AL, Etienne M, Shafighi SR. Age, religious beliefs, and sexual attitudes. J Sex Res 2002; 39(3): 207-16. doi: 10.1080/00224490209552143.
32. Huber M, Reno B, Mckenny J. Long term care personnel assess their attitudes and knowledge of the older adults. J Adv Nurs. 1992; 17 (9): 1114-1121. doi: 10.1111/j.1365-2648.1992.tb02046.x.
33. Kaas MJ. Geriatric sexuality breakdown syndrome. Int J Aging Hum Dev. 1981; 13 (1): 71-77. doi: 10.2190/4A16-06AH-HL5A-WKC3.