Knowledge and attitude of nursing students regarding intimacy and sexuality of older adults: a cross-sectional international study

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ABSTRACT

Background. Although sexual problems are frequent among older adults, they are infrequently discussed by professionals. Nursing students, as future professionals, can make an important contribution by discussing intimacy and sexuality (I&S) with older adults. In order to improve their competence in discussing I&S, current levels of knowledge and attitude needs exploration.

Aim. To investigate i) knowledge and attitude of nursing students regarding I&S of older adults, ii) difference in knowledge and attitude between Canadian and Dutch students and in different years of study and iii) frequency of discussing I&S with older adults.

Methods. The Ageing Sexual Knowledge and Attitudes Scale was distributed among Canadian and Dutch nursing students. Furthermore, demographics and frequencies were asked. Data was analyzed using parametric tests in SPSS.

Results. In total, 776 students participated. The mean knowledge-score was 43.7 (SD=9.0), the mean attitude-score 63.4 (SD=16.6). Dutch students had significant less knowledge and more negative attitudes compared to Canadian students ($p<0.01$). Unlike attitude, the level of knowledge differed significantly per year of study: first year students had the lowest and third year students the highest levels. Most students stated they 'never' or 'once' discussed I&S with older adults (53.7%-12.9%, respectively). Reasons to avoid talking were feelings of 'not being the right person' (17.2%) and 'incompetence' (13.8%).

Conclusion. Nursing students had moderate knowledge and positive attitudes toward older adults' I&S. The knowledge and attitude levels were lower in Dutch students compared to Canadian. This should be interpreted carefully due to possible selection bias. The knowledge-level differed per year of study. Only a minority discussed I&S with older adults.

Implications. Moderate knowledge and positive attitudes do not mean that I&S is discussed with older adults. To ensure students feel responsible and competent, interventions should focus on continuous knowledge dissemination, role clarification and modelling.

Keywords. *Sexuality[MeSH], Aged[MeSH], Nursing students[MeSH].*

SAMENVATTING

Achtergrond. Hoewel seksuele problemen frequent voorkomen bij ouderen, worden deze zelden besproken door zorgprofessionals. Verpleegkunde studenten kunnen als toekomstige zorgprofessionals een belangrijke bijdrage leveren in het bespreken van intimiteit en seksualiteit (I&S) met ouderen. Om hun competenties te verbeteren, is inzicht nodig in het huidige kennis-en attitudeniveau.

Doel. Het onderzoeken van i) kennis-en attitudeniveau van Verpleegkunde studenten met betrekking tot I&S bij ouderen, ii) verschil in kennis en attitude tussen Canadese en Nederlandse studenten en per leerjaar en iii) frequentie van het bespreken van I&S in de praktijk.

Methode. De Ageing Sexual Knowledge and Attitudes Scale werd onder Canadese en Nederlandse studenten verspreid. Daarnaast werden demografische gegevens en frequenties bevraagd. Parametrische testen in SPSS werden gebruikt voor analyse.

Resultaten. In totaal participeerden 776 studenten. De gemiddelde kennisscore was 43.7 (SD=9.0), de gemiddelde attitudescore 63.4 (SD=16.6). Nederlandse studenten hadden significant minder kennis en een negatievere houding ten opzichte van Canadese studenten ($p<0.01$). In tegenstelling tot attitude, verschilde het kennisniveau significant per studiejaar: eerstejaarsstudenten hadden het laagste kennisniveau en derdejaarsstudenten het hoogste. De meeste studenten verklaarden dat ze nooit of éénmaal over I&S met ouderen spraken (respectievelijk 53.7%-12.9%). Reden voor studenten om I&S niet te bespreken, was 'niet de juiste persoon zijn' (17.2%) of 'incompetentie' (13.8%).

Conclusie. Verpleegkunde studenten hadden matige kennisscores en een positieve houding over I&S bij ouderen. Nederlandse studenten hadden minder kennis en negatievere attitudes vergeleken met Canadese studenten. Dit moet zorgvuldig worden geïnterpreteerd vanwege mogelijke selectiebias. Het kennisniveau verschilde per studiejaar. Een minderheid besprak het onderwerp met ouderen in de praktijk.

Aanbevelingen. Matige kennis en een positieve houding betekent niet dat I&S daadwerkelijk wordt besproken met ouderen. Om te zorgen dat studenten zich verantwoordelijk en bekwaam voelen om het onderwerp te bespreken, moeten interventies gericht zijn op continue kennisverspreiding, rolverduidelijking en rolmodellen.

Trefwoorden. *Seksualiteit, Ouderen, Verpleegkunde studenten.*

INTRODUCTION

Sexual health or sexuality is an important aspect of quality of life in humans. The World Health Organization defines sexuality as 'a central aspect of being human throughout life and encompasses sex, gender identities and roles, sexual orientation, eroticism, pleasure, intimacy and reproduction'[1(p5)]. Although sexuality is often associated with younger adults, research shows that older adults (defined as ≥65 years[2]) can remain sexually interested and enjoy an active sex life[3-10].

From the perspective of older adults, sex is seen as an important component of a close emotional relationship in later life[11]. Most older adults stated in a qualitative inquiry that their sex life was moderate to extremely important[11]. Reasons older adults engage in sex varies from maintaining overall functioning, to feel young, attractive and desirable[12]. Unfortunately, half of the sexually active older adults, included in a large study in 2007, reported at least one sexual problem[3]. Despite the fact that sexual problems are frequent among older adults[3,4,13-15], they are infrequently discussed with health care professionals (HCPs)[3,14,16-18].

From all HCPs, nurses have a major impact on older adults' behavior, as a result of their intensive involvement in hands-on care, interaction with older adults and access to intimate information[19]. Therefore, nurses are in an ideal position to assess normal and pathologic aging changes, and to prevent or discuss sexual problems[20].
However, research in Sweden showed 20% of nurses in medical and surgical wards took time to discuss sexual concerns, and 40% of the nurses felt confident in their ability to address patients' sexual concerns[21]. Barriers to address patient sexuality in nursing practice were what nurses believe patients expect from them, time availability, personal comfort, and confidence in the ability to address issues related to human sexuality[22]. Additionally, high age of the patient was mentioned as barrier in multiple studies[23-25].

As knowledge is a factor that influences recognition of problems by nurses[26], knowledge of intimacy and sexuality (I&S) of older adults is important. Attitude, defined as 'a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor'[27(p585)], is thought to directly influence behavior[28]. A higher level of knowledge regarding I&S of older adults is associated with a higher positive attitude toward I&S in later life[19,29]. Multiple studies investigated the knowledge and attitude of nurses regarding I&S of older adults[19,28,30]. Older nurses felt more confident in their ability to address patients' sexual concerns and had more positive attitudes towards discussing sexuality[19,21,28,30]. Furthermore, nurses with additional training or education had more positive attitude towards discussing

sexuality than those without[19,21,28,30]. Remarkably, the overall level of knowledge and attitude of nurses was different between studies in diverse countries[19,31,32]. However, no study is published comparing the knowledge and attitude of nurses or nursing students between countries. Furthermore, Fennell and Grant implicate in their systematic review to 'have more rigorous international research conducted on the topic of nursing and sexual healthcare'[29(p19)].

As nursing students are often young and unexperienced, their knowledge regarding I&S is, in general, narrow[33]. Despite a positive attitude, students feel uncomfortable addressing I&S and are reluctant to initiate a conversation[33]. Since nursing students are future practitioners, failing recognition of problems or disfavor of I&S of older adults might influence the quality of care provided and their interactions with older adults.

Sexual healthcare education can help nursing students explore their own values and feelings and enhance their knowledge on older adults' sexuality. This may lead to better exploration, diagnose and treatment of sexual problems, resulting in better quality of health care and quality of life[19,30,34]. In order to improve skills of nursing students in discussing I&S, education should be adapted to their present level of knowledge and attitude. Earlier studies on this topic are outdated[35], investigated only first year nursing students[32] or didn't address specific older adults[33,36-39]. Next to this gap in knowledge, the systematic review of Haesler et al showed inconsistencies between the belief in HCPs that sexual health is important and the practice of taking a sexual history[26]. Unfortunately, research about discussing I&S is underexposed. Haesler et al state 'more robust exploration of HCPs knowledge of and attitudes toward sexuality of older people is warranted'[26(p71)].

AIM

The purpose of this study was threefold. First, we wanted to gain insight in the knowledge and attitude of nursing students regarding I&S of older adults. Second, we aimed to investigate the difference in knowledge and attitude of nursing students towards I&S of older adults between Canada and the Netherlands and in different years of study. Third, we wanted to know the frequency of nursing students discussing I&S with older adults.

METHODS

Design

A descriptive cross-sectional design was used. The aims contain i) the *level* of knowledge and attitude, ii) the *difference* between Canada and the Netherlands and year of study and iii) *how often* nursing students discuss I&S. Hence, a quantitative design, known for counting, measurements and finding connections, was most suitable[40]. The cross-sectional design was chosen because of the need to know and describe the *current* level of knowledge and attitude of the students[41]. An international design was considered appropriate due to an international interest in the topic and a gap in knowledge about the current level of knowledge and attitude in participating countries. Furthermore, participating countries wanted to learn from each other's education systems.

Population and domain

The population of interest were nursing students of ≥16 years who were able to read and write English (Canada) or Dutch (the Netherlands). The convenience sample was nursing students in all years of study in the University of Applied Sciences (UAS) in southeast Canada and the northeastern part of the Netherlands.

The sample-size was based on the sample size calculation for cross sectional studies[42]. The research team decided to establish the risk of Type-I-error (α) as 0.05 and the absolute error of precision of two points on either side. This was a practical decision, due to the available population. The number of nursing students needed to fill out the questionnaires was a minimum of 347.

Data collection

The survey administered to participants included three sections (Appendix 1). The first section covered socio-demographic information such as sex, age, relationship, marital status and religion. Previous research showed these demographics could influence the level of knowledge and attitude regarding I&S[9,12,28,29,31,43-45]. Year of study was included for the second aim. Experience in elderly care and prior sex education were included to check whether further questions needed to be asked.

The second section covered the level of knowledge and attitude, using the Ageing Sexual Knowledge and Attitudes Scale (ASKAS). The ASKAS can be used for assessing the attitudinal aspects of sexuality of older adults and the individual's knowledge about age-related changes in sexual functioning[46]. The original English ASKAS contains 60-items. The reliability of the scale has been found to be within acceptable limits[46]. The scale's validity was demonstrated by its sensitivity to educational interventions[46]. The translated Dutch version, the

ASKAS-D3, contains 51-items and showed good estimates of content validity, face validity, user-friendliness and internal consistency (Cronbach's α knowledge-subscale=0.80, Cronbach's α attitude-subscale=0.88)[47]. For purpose of this study, the same 51-items were used for both the English and Dutch questionnaires. These questionnaires contained 26 questions on knowledge using a true/false/don't know response. A correct, wrong and 'don't know' answer were equated with a score of 1, 2, or 3, respectively[47]. The range was 26-78 with a low score indicating high knowledge[47]. Twenty-five questions assessed participants' attitudes using a seven-point Likert scale, indicating the extent of agreement or disagreement[47]. The range was 25-175 with a low score indicating a positive attitude[47]. As no predefined cut-off points were available for the ASKAS, other studies were used to define low, moderate, average, or high/positive knowledge and attitude[19,32].

The final part of the survey contained seven non-validated questions about the frequency of discussing I&S with older adults. This part contained questions like 'How many times did you discuss I&S in the past year?' and 'Who introduced the topic?'. Two studies were used as an example[48,49]. The questions were checked by experts in the field and by a panel of nursing students prior to data collection. Minor adjustments were made.

Procedure

The survey was administered between February-April 2019 in Canada and the Netherlands. The procedures in Canada and the Netherlands for recruitment differed due to requirements of the independent ethical commissions (IEC). Lecturers were informed about the study by elevator pitches in the Netherlands and by emails in Canada and the Netherlands. In Canada, an email was sent and an announcement was made on the virtual learning environment by the researcher to all nursing students, with a weblink to the survey. After four weeks, a reminder was sent. In the Netherlands, researchers scheduled the data collection in existing lessons, in order to reach all students. Students were given the opportunity to complete the survey in regular class time by means of gaining high response, as was seen in a recent study[32]. Lecturers were sent a weblink to the survey. Nursing students were asked by their lecturer to fill out the survey.

Data analysis

Data was analyzed using SPSS (IBM Corp, Armonk, NY), version 24.0[50]. Descriptive summary statistics were used for levels of knowledge and attitude, frequencies and demographic data. For the knowledge subscale, the homogeneity of variance assumption in the different years of study was not met. Therefore, the independent sample t-test for the difference between countries and Welch's Analysis of Variance (ANOVA) with Games-Howell Post-hoc test for difference between years were performed[51]. For the attitude subscale, a two-way ANOVA was

used, as all assumptions were met. For both subscales, sensitivity analysis was performed with and without outliers, finding no difference in the results. Hence, outliers were not removed. Statistical significance was defined as $p<0.05$ for two-sided tests with confidence intervals at 95%. A predefined syntax was used. Missing data during data collection was minimized by assigning mandatory questions. However, not all students completed the whole survey. If the knowledge or attitude subscale had missing values, no sumscore could be calculated. This was considered by performing a full case analysis per subscale.

Ethical issues

The participating UASs obtained ethical approval for this study from their IECs. This study was not subject to Medical Research Involving Human Subjects Act, as students were not asked to act or to change behaviors and the questions were not of a drastic nature[52]. Therefore, the study was conducted according to the principles of the Declaration of Helsinki[53] (version:09/7/2018) and guidelines for Good Clinical Practice[54] (version:11/9/2016).

To ensure participants were well informed, we took several precautions. We informed students by an announcement on the virtual learning environment and by providing a written information form by email. Participation was voluntary. Consent was given in the survey.

As data was exchanged from Canada to the Netherlands, the General Data Protection Regulation was followed[55]. Data was shared and is stored for ten years in the secured data repository SurfSara[56]. Since the researchers had no personal information about the students, the general characters could not be linked to individual students. The Dutch students gained study points for their quality register after completing the survey. Participation remained voluntary, as students could also gain study points in other ways.

RESULTS

Participants

Out of a population of 2311 nursing students, 776 participated. From an UAS in Canada, 44 participants participated and 732 from an UAS in the Netherlands (response rate 6.1% and 49.0%, respectively). Table 1 shows an overview of the participants' characteristics. The participants were primarily female (90.7%). Participants' ages ranged from 16 to 52 years, with a median of 20 years. Canadian students were older than Dutch students (median=21 years and median=20 years, respectively). A majority had no experience in caring for older adults or had approximately one year of experience (30.4% and 39.1%, respectively). Canadian participants had more often multiple years of experience in elderly care (75%) compared to Dutch participants (27,8%). An education course addressing I&S was taken by 61% of the participants during the past years; more Dutch students had taken a course (62,8%) compared to Canadian students (31.8%). In Canada, most participants were in their last year of study (31.8%), in the Netherlands most participants were in their first year of study (38.5%).

[Table 1]

Knowledge of nursing students

Participants had a mean knowledge-score of 43.7 (SD=9.0; ASKAS-range=26-78). In table 2, the mean scores are presented. The mean knowledge-score of nursing students in the Netherlands was significantly higher, meaning a lower level of knowledge, compared to Canada ($p<0.01$). In addition, the mean knowledge-score of first year students was significantly higher compared to year two and three ($p<0.01$). The mean knowledge-score of students in year three was significantly lower, meaning a higher level of knowledge, compared to year four ($p=0.031$).

Attitude of nursing students

Participants had a mean attitude-score of 63.4 (SD=16.6; ASKAS-range=25-175). In table 2, the mean scores are presented. No interaction and no main effect in year of education were found. Dutch students had significantly higher attitude-scores, meaning a more negative attitude, compared to Canadian students ($p<0.01$).

[Table 2]

Discussing I&S

Most participants with experience in elderly care stated they never talked about I&S with older adults (53.7%). If a conversation took place, nursing students or a colleague initiated the topic

(28.2% and 26.4%, respectively) followed by older adults themselves (23.6%). Reasons to talk about I&S were the wish of the older adults (26.5%), or seeing or hearing I&S (26.3%). When nursing students talked about I&S, the reaction of the older adults was mainly positive according to the participants: 26.4% of the older adults discussed the topic with ease, 17.9% seemed relieved. Negative reactions were mentioned less often by the participants (28.1%). Reasons for nursing students to avoid discussing I&S were the feeling they were not the right person to discuss this topic (17.2%) or feelings of incompetence (13.8%). A minority of participants stated they should have discussed I&S more often (41.3%). However, more Canadian students filled out they should have discussed I&S compared to Dutch students (77.7% and 38.1%, respectively). Table 3 shows the frequency of discussing I&S.

[Table 3]

DISCUSSION

The aim of this study was to examine the current level of knowledge and attitude of nursing students toward I&S of older adults. Nursing students had moderate knowledge and positive attitudes toward I&S in later life. Next to this, we found significant higher knowledge and a more positive attitude in Canadian students compared to Dutch students. The level of knowledge differed per year of study: students in the first year of study had the lowest knowledge and students in year three the highest. The attitude did not differ between years of study. Most students indicated they did not or occasionally discussed the topic with older adults.

A moderate knowledge of nursing students regarding I&S of older adults in the present study is consistent with other findings in studies investigating nurses' knowledge regarding older adults' I&S[19,31,43] or nursing students knowledge regarding I&S in general[33,38]. As most nursing students stated they had followed I&S courses, it is possible that these courses did not provide adequate information. This is underlined by the fact that Dutch students had followed more courses about I&S, but had significant lower knowledge compared to Canada. A review describing I&S courses for professionals showed that the main focus of the courses was contraception and sexually transmitted diseases[57]. Of the 38 included courses in the review, only two contained the topic ageism[57]. This absence of specific information regarding older adults' I&S may affect nurses and nursing students' attitudes and knowledge.

The level of knowledge was higher as the students progressed in education, with an exception of the last year of study. An explanation could be that the Dutch UAS started with an integrated I&S curriculum recently. Students in year four had less integrated courses about I&S compared to year one-three. Thus, integrated attention to the topic seems important in education. Two studies consolidate this positive effect of education[31,58]. The study of Sung and Lin showed a significant beneficial effect of sexual healthcare education in the experimental group on knowledge, attitude and self-efficacy of nursing students related to sexual healthcare compared to the control group[58]. The study of Jones and Moyle showed the importance of delivering education to nursing staff in order to improve knowledge and attitudes on older adults' sexuality, using a pre-post design[31]. Limitations in both studies were the small sample sizes and short interval between pre-and post-tests.

Participants had a rather positive attitude toward sexuality in later life, which is supported by studies investigating nurses' attitude regarding older adults' I&S[19,45] or nursing students' attitude regarding I&S in general[33,37,38]. Unlike knowledge, the level of attitude did not significantly differ per year of study. This indicates that, in our study, sexual education throughout the years of study had minor impact on attitudes. There is no consensus about the

effect of sexual education on attitude: one study confirms our finding[32], and several studies do not[19,30,31,34]. An explanation is mentioned by Bauer et al, discussing Lewis and Bor's theory: while education may increase knowledge, attitudes to emotive areas such as I&S might be more resistant to change[30]. Therefore, role models should be present during education and internships to demonstrate discussing I&S and show students their positive views on I&S[33].

Although Canada and the Netherlands are both Western countries, their levels of knowledge and attitude differed significantly. To our knowledge, this is the first study where levels of knowledge and attitudes of nursing students in two countries were compared. Fennell and Grants assumption that barriers in discussing knowledge and attitude are cultural, seem plausible[29]. Culture could be defined as 'a set of attitudes, values, beliefs, and behaviors shared by a group of people'[59(p16)]. Our findings indicate that current levels of attitude and knowledge should be known per country when sexual health education is designed.

The lack of discussing I&S has been reported before[21,26,33]. The main barriers for nursing students to avoid discussing I&S were the feeling of incompetence and not being the right person. These findings are confirmed by other inquiries[29,33]. In a review, Blakey and Aveyard stated students did not feel equipped and felt uncertain on their role responsibility[33]. Low confidence levels and low self-rated competence were reported[33]. Other barriers for the lack of discussing I&S in this review were lack of time, no priority given to I&S, age assumptions and embarrassment and fear of being offensive[33]. All these barriers were asked in our survey, however, students stated that these factors were less important.
Surprisingly, if nursing students discussed I&S with older adults, the reaction of the older adult was mainly positive. This reaction could be highlighted in education programs, as worrying for negative reactions was common in prior research[33].

Limitations and strengths

To appreciate the findings of this study, some limitations require consideration. First, the number of participants per country was unbalanced, as 44 Canadian nursing students participated versus 732 Dutch students. The unbalanced samples could be caused by different recruitment procedures and the fact that Dutch students could gain study points. The Canadian response rate of 6.1% could be defined as very low. This low response rate could lead to selection bias and non-response bias. Chances are that Canadian students with openness toward the topic were more inclined to participate. This selection bias might explain the high knowledge and positive attitude towards sexuality among Canadian students, or the fact that Canadian students were older, more experienced and more often in their last year of study than Dutch students. This calls for caution when it comes to the external validity of our results

regarding the second aim. Second, the design of the study was a cross-sectional self-reporting survey. Self-reporting could lead to response bias or social-desirability bias, where the participants want to 'look good'[61]. Third, analyses are based upon a convenient sample of UASs in Canada and the Netherlands. The participants were young, in a relationship and non-religious or Christians. Therefore, the findings may not be generalizable to a more diverse sample or different geographic locations.
A strength of this study is the use of international data, as an answer to Fennell and Grants' recommendation[29]. This provided rich data, from countries where no such study was conducted before. Second, the large sample size in this study provided great statistical power to investigate the current level of knowledge and attitude, as was the main aim of this study. Last, we used the well-known and validated ASKAS questionnaire. Hence, we could compare our results with other inquiries and we can contribute to a meta-analysis in the future.

Sexual health is an important aspect of quality of life in humans. This study shows that having moderate knowledge and a positive attitude does not automatically indicate that nursing students discuss I&S with older adults. Students stated they felt they were not the right person to discuss the topic or felt incompetent. Therefore, we recommend to offer continuous education for nursing students in all years of study and training for nurses in health care institutions[33,62]. Despite the fact that Dutch students stated they had followed sexual education more often compared to Canadian students, their knowledge was significantly lower. It is possible that this previous education did not provide adequate information Hence, these trainings should focus on the anatomy and physiology of aging in combination with I&S and familiarization of models and practice the skills in order to gain confidence to discuss the topic[26,33]. As students stated they shouldn't have discussed I&S more often, a clarification of role responsibilities concerning discussing I&S in elderly care should be made available. Also, the presence of role models in universities and clinical placements will help students with an example how to discuss I&S[33].

Future research should explore nursing students' behavior regarding I&S of older adults in practice. Observational research may provide information self-reported research is incapable of. As findings of the effect of education on attitudes in the different years of study are contradictive in multiple inquiries, we advise to perform a meta-analysis on this topic. Finally, further research is needed to assess whether and how educational programs improve nursing students' attitudes and knowledge towards older adults' sexuality in different countries.

Conclusion

Nursing students had moderate knowledge and positive attitudes toward I&S of older adults. Dutch students had significant less knowledge and more negative attitudes compared to Canadian students. However, this could be due to selection bias in Canada and should be interpreted carefully. In contrast to attitude, the level of knowledge differed significantly per year of study. Only a minority of students discussed the topic with older adults. In order to make sure nursing students feel both responsible and competent to discuss I&S, interventions should aim on the continuous education with attention to later life's sexuality, clarification of role responsibilities and adding role models 'on the job'. It is important to take international differences in levels of knowledge and attitude into account when developing these interventions.

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Table 1. Baseline characteristics of the study population.

Characteristic	Total	Canada	Netherlands
	n *(%)*	n (*%*)	n (*%*)
Participants	776 (*100%*)	44 (*5,7%*)	732 (*94.3%*)
Age *(Median, IQR)*[a]	20 (*19-22*)	21 (*19-25.25*)	20 (*19-21*)
Gender[b]			
Female	704 (*90.7%*)	40 (*90.9%*)	664 (*90.7%*)
Relationship			
Yes	408 (*52.6%*)	29 (*65.9%*)	379 (*51.8%*)
Marital status			
Unmarried	698 (*89.9%*)	31 (*70.5%*)	667 (*91.1%*)
Cohabiting	59 (*7.6%*)	6 (*13.6%*)	53 (*7.2%*)
Married	15 (*1.9%*)	6 (*13.6%*)	9 (*1.2%*)
Registered as partners	2 (*0.3%*)	0 (*0%*)	2 (*0.3%*)
Divorced	2 (*0.3%*)	1 (*2.3%*)	1 (*0.1%*)
Religion			
Christian/Catholic	306 (*39.4%*)	20 (*45.5%*)	286 (*39.1%*)
Muslim	26 (*3.4%*)	0 (*0%*)	26 (*3.6%*)
Jew	1 (*0.1%*)	0 (*0%*)	1 (*0.1%*)
No religion	435 (*56.1%*)	23 (*52.3%*)	412 (*56.3%*)
Other	8 (*1.0%*)	1 (*2.3%*)	7 (*1.0%*)
Year of study			
Year 1	291 (*37.5%*)	9 (*20.5%*)	282 (*38.5%*)
Year 2	265 (*34.1%*)	12 (*27.3%*)	253 (*34.6%*)
Year 3	127 (*16.4%*)	9 (*20.5%*)	118 (*16.1%*)
Year 4 (or above)	93 (*12.0%*)	14 (*31.8%*)	79 (*10.8%*)
Years of experience in elderly care[c]			
No experience	236 (*30.4%*)	0 (*0%*)	236 (*32.2%*)
± 1 year	304 (*39.1%*)	11 (*25.0%*)	293 (*40%*)
± 2 years	57 (*7.3%*)	11 (*25.0%*)	46 (*6.3%*)
± 3 years	45 (*5.8%*)	2 (*4.5%*)	43 (*5.9%*)
± 4 years	46 (*5.9%*)	11 (*25.0%*)	35 (*4.8%*)
> 4 years	60 (*7.7%*)	9 (*20.5%*)	51 (*7.0%*)
Prior sexual education			
Yes	474 (*61.1%*)	14 (*31.8%*)	460 (*62.8%*)

[a]: Age is non-parametric for both countries. [b]: Missing: n=1 (Canada), 0,1%. [c]: Missing: n=28 (Netherlands), 3,6%. n: number; IQR: interquartile range.

Table 2. Attitudes and knowledge of nursing students towards sexuality in older adults by year of study and country.

	Total	**Canada**	**Netherlands**	**Difference between country**	**Difference between year of study**	
	Mean (SD)	*Mean (SD)*	*Mean (SD)*	*Statistic*	*Statistic*	*Multiple comparison*
Knowledge (total)[a]	43.7 (9.0)	39.9 (8.7)	43.9 (8.9)	t=2.89**	Welch= 23.18**	
Year of study 1	46.8 (9.3)	48.0 (13.7)	46.7 (9.2)			Year 1 vs 2**
Year of study 2	41.7 (7.7)	38.3 (6.7)	41.9 (7.8)			Year 1 vs 3**
Year of study 3	40.5 (7.3)	39.5 (5.2)	40.6 (7.4)			Year 1 vs 4^{NS}
Year of study 4	43.9 (10.1)	36.2 (4.0)	45.3 (10.2)			Year 2 vs 3^{NS}
						Year 2 vs 4^{NS}
						Year 3 vs 4*
Attitude (total)[b]	63.4 (16.6)	46.8 (18.1)	64.3 (16.0)	F=44.40**	F=0.49^{NS}	
Year of study 1	64.4 (16.2)	47.9 (19.0)	64.9 (15.9)			
Year of study 2	63.6 (16.5)	50.8 (21.7)	64.2 (16.0)			
Year of study 3	61.8 (16.4)	44.7 (17.9)	63.2 (15.5)			
Year of study 4	61.4 (18.1)	43.8 (15.0)	64.3 (17.0)			

*p<0.05; **p<0.01. [a] ASKAS range knowledge: 26-78. A low score means a high level of knowledge. [b] ASKAS range attitude: 25-175. A low score means a positive attitude. NS: not significant.

Table 3. Frequency and other characteristics on discussing intimacy and sexuality.

	Total	**Canada**	**Netherlands**
	n (%)	n (%)	n (%)
Talked about topic with older adults in the past year[a]			
Never	275 (*53.7%*)	22 (*50.0%*)	253 (*54.1%*)
1 time	66 (*12.9%*)	4 (*9.1%*)	62 (*13.2%*)
2 times	44 (*8.6%*)	4 (*9.1%*)	40 (*8.5%*)
3 times	46 (*9.0%*)	5 (*11.4%*)	41 (*8.8%*)
4 times	27 (*5.3%*)	2 (*4.5%*)	25 (*5.3%*)
5-7 times	19 (*3.7%*)	3 (*6.8%*)	16 (*3.4%*)
8-10 times	10 (*2.0%*)	3 (*6.8%*)	7 (*1.5%*)
> 10 times	13 (*2.5%*)	1 (*2.3%*)	12 (*2.6%*)
Always	12 (*2.3%*)	0 (*0%*)	12 (*2.6%*)
Initiator conversation[b]			
Nursing student themself	124 (*28.2%*)	14 (*32.6%*)	110 (*27.7%*)
Older adult	104 (*23.6%*)	[c]	104 (*26.2%*)
Partner of older adult	35 (*8.0%*)	5 (*11.6%*)	30 (*7.6%*)
Family of older adult	19 (*4.3%*)	2 (*4.7%*)	17 (*4.3%*)
A colleague	116 (*26.4%*)	10 (*23.3%*)	106 (*26.7%*)
A doctor	23 (*5.2%*)	1 (*2.3%*)	22 (*5.5%*)
Other	19 (*4.3%*)	11 (*25.6%*)	8 (*2.0%*)
Reason to initiate conversation[b]			
Wish older adult	106 (*26.5%*)	15 (*29.4%*)	91 (*26.1%*)
Wish partner older adult	42 (*10.5%*)	5 (*9.8%*)	37 (*10.6%*)
Wish family older adult	24 (*6.0%*)	3 (*5.9%*)	21 (*6.0%*)
Order doctor	15 (*3.8%*)	2 (*3.9%*)	13 (*3.7%*)
Guideline/statement	67 (*16.8%*)	11 (*21.6%*)	56 (*16.0%*)
Seeing or hearing intimacy	105 (*26.3%*)	15 (*29.4%*)	90 (*25.8%*)
Other	41 (*10.3%*)	[c]	41 (*11.7%*)
Reaction of older adult[b]			
With ease	96 (*26.4%*)	13 (*32.5%*)	83 (*25.7%*)
Relieved	65 (*17.9%*)	8 (*20.0%*)	57 (*17.6%*)
Neutral	71 (*19.6%*)	10 (*25.0%*)	61 (*18.9%*)
Discomfort	59 (*16.3%*)	3 (*7.5%*)	56 (*17.3%*)
Very discomfort	19 (*5.2%*)	5 (*12.5%*)	14 (*4.3%*)
Angry	9 (*2.5%*)	1 (*2.5%*)	8 (*2.5%*)
Didn't want to talk	15 (*4.1%*)	0 (*0%*)	15 (*4.6%*)
Other	29 (*8.0%*)	[c]	29 (*9.0%*)
Reason to not discuss topic[b]			
I always talk about it	91 (*9.5%*)	5 (*5.4%*)	86 (*9.9%*)
I didn't feel competent	132 (*13.8%*)	11 (*12.0%*)	121 (*14.0%*)
Older adult had no partner	68 (*7.1%*)	7 (*7.6%*)	61 (*7.1%*)
I felt ashamed	60 (*6.3%*)	0 (*0%*)	60 (*6.9%*)
It's private	102 (*10.7%*)	11 (*12.0%*)	91 (*10.5%*)
My religion prohibits	5 (*0.5%*)	2 (*2.2%*)	3 (*0.3%*)
Not my priority	32 (*3.3%*)	4 (*4.3%*)	28 (*3.2%*)
Older adult was too ill	62 (*6.5%*)	10 (*10.9%*)	52 (*6.0%*)
I was too busy	23 (*2.4%*)	3 (*3.3%*)	20 (*2.3%*)
I was not the right person	165 (*17.2%*)	15 (*16.3%*)	150 (*17.3%*)
Age difference	64 (*6.7%*)	10 (*10.9%*)	54 (*6.2%*)
Privacy issues	69 (*7.2%*)	14 (*15.2%*)	55 (*6.4%*)
Other	84 (*8.8%*)	[c]	84 (*9.7%*)

Should you have discussed intimacy and sexuality (more often)?			
Yes	210 (*41.3%*)	33 (*77.3%*)	177 (*38.1%*)
No	298 (*58.7%*)	10 (*22.7%*)	288 (*61.9%*)

[a] When people had no experience in elderly care, these questions were not shown. Therefore, the questions do not add up to the total of participants included in the inquiry. [b] Multiple answers possible. [c] No answer option in the survey of Canada.

APPENDIX

1. Survey, including Ageing Sexual Knowledge and Attitudes Scale (ASKAS)

Knowledge and attitude of nursing students regarding intimacy and sexuality of older adults: a cross-sectional international study

Canada	Netherlands
By clicking "yes, I consent to participate in this survey" you agree: • That the goals of the study have been explained to you and that you have had the opportunity to have your questions answered • That the research team has your consent to use the information submitted to publish or present findings in scholarly communications • That the research team has your consent to the use of your information as described in this form • To take part in this study Yes, I consent to participate in the survey No, I do not consent to participate in the survey	When you agree upon participation to this study, please click on the 'next' button'

Part 1: Socio-demographic data

1. What is your gender?

Male

Female

Other

2. What is your age?

3. Are you currently in a relationship?

Yes

No

4. What is your marital status?

Single

Living together

Married

Separated

Divorced

Widow/Widower

5. What is your religion?

Christian/Catholic

Muslim

Jewish

None

Other

6. What is your year of study?

1

2

3

4

Other

8. What is your field of study?

9. Have you taken a course on intimacy and sexuality?

Yes

No

Part 2: The ASKAS – Knowledge Section

The knowledge section consists of 26 questions about sexuality in older adults. There are three (3) answer options “True”, “False” or “Don’t know”. Take your time with answering these questions. If you do not know the answer, just fill in "Don't know". Please check only one answer per question. All your answers will remain anonymous.

1. Sexual activity in aged persons is often dangerous to their health.

2. The older female (65+ years of age) has reduced vaginal lubrication secretion relative to younger females.

3. The aged female takes longer to achieve adequate vaginal lubrication relative to younger females.

4. Sexuality is typically a lifelong need.
5. Sexual behavior in older people (65+) increases the risk of heart attack.
6. Most males over the age of 65 are unable to engage in sexual intercourse.
7. There is evidence that sexual activity in older persons has beneficial physical effects on the participants.
8. Sexual activity may be psychologically beneficial to older person participants.
9. Most older females are sexually unresponsive.
10. The sex urge typically increases with age in males over 65.
11. Prescription drugs may alter a person's sex drive.
12. Females, after menopause, have a physiological-induced need for sexual activity.
13. Basically, changes with advanced age (65+) in sexuality involve a slowing of response time rather than a reduction of interest in sex.
14. The most common determinant of the frequency of sexual activity in older couples is the interest or lack of interest of the husband in a sexual relationship with his wife.
15. Barbiturates, tranquilizers, and alcohol may lower the sexual arousal levels of aged persons and interfere with sexual responsiveness.
16. Sexual disinterest in aged persons may be a reflection of a psychological state of depression.
17. There is a decrease in frequency of sexual activity with older age in males.
18. There is a greater decrease in male sexuality with age than there is in female sexuality.
19. An important factor in the maintenance of sexual responsiveness in the aging male is the consistency of sexual activity throughout his life.
20. Fear of the inability to perform sexually may bring about an inability to perform sexually in older males.
21. The ending of sexual activity in old age is most likely and primarily due to social and psychological causes rather than biological and physical causes.
22. Excessive masturbation may bring about an early onset of mental confusion and dementia in the aged.
23. There is an inevitable loss of sexual satisfaction in post-menopausal women.
24. Secondary impotence (or non-physiologically caused) increases in males over the age of 60 relative to young males.
25. In the absence of severe physical disability, males and females may maintain sexual interest and activity well into their 80s and 90s.
26. Masturbation in older males and females has beneficial effects on the maintenance of sexual responsiveness.

Part 3: The ASKAS – Attitude Section

The Attitude Section contains 25 questions about older adults' sexuality. You must answer each question on a 7-point scale; from "totally disagree" to "completely agree".

1 totally disagree
2 disagree
3 partially disagree
4 not disagree nor agree
5 partially agree
6 agree
7 completely disagree

There are no correct or wrong answers and we ask you to answer the questions spontaneously.

1. Aged people have little interest in sexuality. (Aged = 65+ years of age)
2. An aged person who shows sexual interest brings disgrace to himself/herself.
3. Institutions, such as nursing homes, ought not to encourage or support sexual activity of any sort in their residents.
4. Male and female residents of nursing homes ought to live on separate floors or separate wings of the nursing home.
5. Nursing homes have no obligation to provide adequate privacy for residents who desire to be alone, either by themselves or as a couple.
6. As one becomes older (say, past 65) interest in sexuality inevitably disappears.

If a relative of mine, living in a nursing home, was to have a sexual relationship with another resident I would:

7. Complain to the management.
8. Move my relative from this institution.
9. Stay out of it, as it is not my concern.
10. If I knew that a particular nursing home permitted and supported sexual activity in residents who desired such, I would not place a relative in that nursing home.
11. It is immoral for older persons to engage in recreational sex.
12. I would like to know more about the changes in sexual functioning in older years.
13. I feel I know all I need to know about sexuality in the aged.
14. I would complain to the management if I knew of sexual activity between any residents of a nursing home.
15. I would support sex education courses for aged residents of nursing homes.
16. I would support sex education courses for the staff of nursing homes.
17. Masturbation is an acceptable sexual activity for older males.

18. Masturbation is an acceptable sexual activity for older females.
19. Institutions, such as nursing homes, ought to provide large enough beds for couples who desire such to sleep together.
20. Staff of nursing homes ought to be trained or educated with regard to sexuality in the aged and/or disabled.
21. Residents of nursing homes ought not to engage in sexual activity of any sort.
22. Institutions, such as nursing homes, should provide opportunities for the social interaction of men and women.
23. Institutions, such as nursing homes, should provide privacy such as to allow residents to engage in sexual behavior without fear of intrusion or observation.
24. If family members object to a widowed relative engaging in sexual relationships with another resident of a nursing home, it is the obligation of the management and staff to make certain that such sexual activity is prevented.
25. Sexual relations outside of the context of marriage are always wrong.

Part 4: Additional Questions

Experience in the care of the elderly

1. How many years do you have experience in the care of the elderly?

0 years (no experience).
About 1 year.
About 2 years.
About 3 years.
About 4 years.
More than 4 years.

Discussing intimacy and sexuality

2. How many times have you discussed intimacy and sexuality with the elderly in the past year?

0 times (never) (Continue to question 6).
About one time.
About 2 times.
About 3 times.
About 4 times.
About 5-7 times.
About 8-10 times.
More than 10 times.
I always discuss intimacy and sexuality.

Initiative

3. Who came up with the initiative to talk about intimacy and sexuality? (multiple answers are possible, because the subject can be discussed more than once)

Myself.
The older adult.
The partner of the older adult.
Family other than the older adult's partner.
A colleague.
A treating physician.
Other:

Reason to discuss

4. What was the reason to discuss the subject of intimacy and sexuality? (multiple answers are possible)

Desire of the older adult.
Wish of the older adult's partner.
Wish of the older adult's family.
Policy of the treating physician.
Follow the directive (s)/protocol.
See or hear about intimacy and sexuality.
Other:

Response

5. What was the response of the older adult on discussing intimacy and sexuality? The older adult (multiple answers are possible, because the subject can be discussed more than once):

Discussed the subject with ease.
Seemed relieved that the subject was discussed.
Seemed neutral in discussing intimacy and sexuality.
Discussed the subject with any inconvenience.
Discussed the subject with a lot of discomfort.
Became angry.
Did not want to have a conversation about intimacy and sexuality.
Other:

Do not discuss

6. Think of one or more situation(s) in the past year where you did not discuss the subject of intimacy and sexuality in a conversation with an older person. What was the reason for you not to start on intimacy and sexuality? (multiple answers are possible)

Not applicable, I always discuss the subject of intimacy and sexuality.
I did not feel competent enough.
The older adult had no partner.
Sense of shame.
The subject of intimacy and sexuality I find private.
Because of my faith/religious reasons.
Intimacy and sexuality are not a priority for me.
The older adult was too sick to discuss intimacy and sexuality.
I was too busy.
I did not think I was the designated person to talk about this subject.
The age difference between myself and the older person.
Lack of privacy, the partner of the older adult was present at the conversation.
Lack of privacy, there were family/friends at the conversation present.
Other:

Looking back

7. Do you think, in hindsight, that you should have discussed intimacy and sexuality (more often) in the past year?

Yes.
No.

Thank you for your cooperation in this research!