Sexual violence in medical students and trainees in Flanders: a population survey

By J. Tijtgat, L. Dewulf, M. Geldolf, M. Haezeleer, Prof. Dr. N. Pouliart and Prof. Dr. I. Keygnaert

Preprints are preliminary reports that have not undergone peer review. They should not be considered conclusive, used to inform clinical practice, or referenced by the media as validated information.
Abstract

Background: Sexual violence has globally been recognized as harmful to young people’s health. In medical school, which is a highly competitive environment, the risk is supposedly even bigger. In this study we firstly aimed to investigate the magnitude and promoting factors of sexual violence in medical students and trainees in Flanders. Secondly, we wanted to assess the reactive behaviours as well as the knowledge of possible types of bystander reactions as well as potential support resources for victims of sexual violence.

Methods: This study was initiated and coordinated by the Flemish medical student representation organ (VGSO). A survey containing demographic and behaviour-specific questions based on the UN-MENAMAIS and SAS-V questionnaire was sent to all undergraduate, graduate and postgraduate students of the 5 medical schools in Flanders. Participants were asked to limit their responses to internship-related events. Further questions concerning reactions to sexual violence, perpetrators, bystander reactions and general knowledge concerning support after sexual violence were asked.

Results: We received 3015 valid responses to our survey, obtaining a response rate of 29% in the potential target population. Within the total study population, 1168 of 3015 participants (38.73%) reported having been victim of at least one type of sexual violence as explored by our survey. This percentage was the highest in GP trainees (53%), followed by specialist trainees (50%) and master students (39%). Perpetrators of sexual violence varied, most often they were medical staff members, students or patients. In most types of sexual violence, nobody reacted to this behaviour. Women (57.3%) talked about what happened afterwards more often than men (39.7%). When asked about their knowledge of possible bystander reactions and support services for sexual violence, 60% of the respondents did not know about their existence.

Conclusions: Sexual violence is still a relatively frequent issue in medical students and trainees. Patients form an important part of the assailants. In a third of reported sexual violence cases, nobody
reacted. In addition, male victims seem to underreport. There is still much need for sensibilisation on support mechanisms and centres for victims and witnesses of sexual violence.

Keywords

Sexual violence, sexual harassment, medical students, bystander actions, support resources, Flanders, Belgium, medical school, trainee, graduate, postgraduate, undergraduate

Background

The World Health Organization (WHO) defines sexual violence as ‘any sexual act that is carried out against someone’s will. It can be carried out by any person, regardless of his or her relationship to the victim, in any setting’. [1] Sexual violence is divided in different types according to the degree of physical contact. Generally, a distinction is made between ‘hands-off’ behaviour such as sexual remarks, so called jokes and sexting and ‘hands-on’ behaviour such as kissing, touching or forced intercourse. [2]

Reports of sexual violence in medical training date back to the early nineties in the United States. [3] Sexual violence has increasingly been recognized around the world as an issue in medical training and healthcare ever since. Renewed attention was drawn to this issue by the ‘Me Too’ movement, with broad media coverage of recent revelations of sexual violence, inducing concern about its frequency and impact. Recent studies have shown that between 30% and 50% of medical trainees self-report an experience of sexual violence during their medical training. [4–7]

In Belgium, medical education is divided into three phases. As a bachelor (undergraduate) student, medical students spend most of their time in university halls for theoretical courses. In general, bachelor students are exposed to the hospital environment only during a 1- or 2-week introductory clerkship. After three years, students enter their masters (graduate). During the masters (3 years), students participate in at least 12 months of hospital internships in both university hospitals as well as general hospitals and GP offices. Finally, after graduating, students enrol in postgraduate training to
become a specialist as specialist trainee (called “arts-specialist in opleiding” or “ASO” in Flanders) for
4-6 years or general practitioner as GP trainee (as “huisarts in opleiding” or “HAIO”) for 3 years. For
each internship there is a supervisor who is responsible for the evaluation and education of the intern
or trainee.

Several characteristics of medical training programs might predispose medical students and trainees
to encounter sexual violence. The very nature of a physicians’ work can be considered sexually charged
and emotionally taxing. Working long hours in small groups in a new, unfamiliar environment can
contribute to a breakdown of social barriers.[3] Reports of female victims are much more frequent
than reports by their male colleagues. Many young trainees nowadays are women, while most
supervising physicians are still male. Furthermore, sexual violence is often underreported out of
shame, guilt or fearing retaliation from the harassers.[8] In male students, this risk is even bigger
because of the taboo on the subject as well as the long-time neglect of inclusion of male participants
in research into sexual violence. [9]

The fear of a negative impact on grades, the quality of the education or even career opportunities
discourage many medical students and trainees to report sexual violence, especially in the highly
competitive environment of medical training. In short, medical trainees have a high risk of becoming a
victim of sexual violence and research is needed to examine the context wherein this happens and the
actions that can be taken to prevent sexual violence from happening.

Our goal is to advocate for an effective policy to prevent sexual violence during medical training in
Flanders as well as to improve the knowledge of and access to support resources for victims.

In this paper, we aim to assess the prevalence of various hands-off and hands-on types of sexual
violence during medical education in Flanders (Belgium) and to identify the main obstacles for
reporting this behaviour.
Methods

1. Study design

This study was initiated and coordinated by the Vlaams Geneeskundig StudentenOverleg (VGSO), the medical student representation organ regrouping the five medical schools in Belgium.

We designed a survey using demographic and behaviour-specific questions inquiring whether participants had been exposed to specific types of behaviour. Thereby we avoided predefining sexual violence. First, we asked the respondent’s sex, university, current education level and cumulative duration of internships up to the enquiry. The behavioural questions were based on the UN-MENAMAIS questionnaire of Keygnaert et al. [10] as well as the SAV-S questionnaire by Krahé et al. [11]. We focused on those types of behaviour most applicable to medical education and added context where applicable. The behaviour types defined as sexual violence and sexual violence investigated both hands-on and hands-off behaviour. Within hands-off behaviour we looked at (attempts of) inappropriate jokes or remarks, sexting and unwanted undressing (of the victim and/or perpetrator or taking a recording thereof). Within hands-on behaviour we looked at (attempts of) unwanted acts of kissing, touching, oral sex and penetration. Participants were asked to limit their responses to workplace-related events.

When a respondent acknowledged having experienced a type of behaviour, we asked to specify the type of perpetrator (student, trainee, medical staff, supervisor, paramedical staff, patient or others), the frequency of this behaviour, circumstances facilitating the behaviour (hierarchical position, inability to flee, threats regarding performance results, alcohol or drugs, physical violence, others) and if somebody reacted to this behaviour. When somebody reacted to this behaviour, we further explored who reacted (the victim him/herself, a student, trainee, medical staff, supervisor, paramedical staff, patient or others) as well as the type of reaction according to the 4 D’s of bystander intervention: direct action (confronting the perpetrator with his behaviour), distraction (distracting the perpetrator from the situation), delay (asking the victim how he/she feels afterwards) and delegate (reporting to higher
For each D we explored the most applicable example of this behaviour within the context of medical education.

After looking into these specific types of behaviour, we asked if respondents who were a victim of one or more behaviour types talked about what happened to them with somebody and if so with whom: a friend or family member, a trust person (mentor, support person, faculty member, ...), a care facility or if they filed a formal complaint.

General questions about the knowledge regarding types of bystander reactions, types of victim reactions and support services in case of sexual violence were asked to all respondents at the end of the survey.

Before sending out the survey we ran a pilot test with a varied group of 30 participants with different profiles to screen the survey for possible bias and confusion.

2. Ethics board approval

This study was approved after review of the study protocol and survey contents by the ethical board of the UZ Brussel university hospital on 18-03-2019 with the B.U.N. 143201837964.

3. Recruitment

An introductory text explaining the goals of the study containing a link to the survey on SurveyMonkey (SurveyMonkey Inc., San Mateo, California, USA), was sent to all undergraduate (bachelor), graduate (master) and postgraduate (ASO/HAIIO) students of the five Flemish medical schools: Vrije Universiteit Brussel (VUB), KU Leuven, University of Antwerp (UA), Ghent university (UGent) and Hasselt University (UHasselt, only undergraduates). For privacy reasons, the invitation containing the introductory text was sent to all potential participants by the administration of each medical school using a premade template text identical for all schools. Only students who participated in at least one medical internship were asked to participate. Two reminders were sent to all potential participants with a 2-week interval.

The survey was open from the 1st of April 2019 until mid-May 2019 (6 weeks in total).
4. Data analysis

The incomplete (defined as not having answered at least 1 behavioural question) and disqualified (didn’t participate in an internship yet) responses were removed, as we only wanted to examine workplace-related behaviour. The data from SurveyMonkey was exported into SPSS. We conducted all statistical analyses using SPSS statistical software, version 25.0 (SPSS Inc., Chicago, IL., USA). A chi-square test of goodness-of-fit was performed to determine whether the human sex ratio was equally obtained for the study population in comparison with the initial target population. Statistical significance was set at a \( p \)-value \( \leq 0.05 \). Furthermore, we used descriptive statistics to quantitatively describe the differences in frequency of all variables.

Results

1. Demographics

In total, we received 3299 responses to our survey. After excluding 220 participants because they did not participate in any internship yet and 64 participants because they did not answer at least one behaviour-specific question, 3015 valid responses were analysed (table 1). We obtained a total response rate of 29.6% of which 35% of participants were male and 65% were female.

| Survey population characteristics | N    | N (%) | n    | n (%) | Response rate (% n of N) |
|-----------------------------------|------|-------|------|-------|--------------------------|
| Total                             | 10.406 | 100   | 3.015 | 100   | 30                       |
| Gender                            |       |       |      |       |                          |
| Male                              | 4377  | 42    | 1048 | 35    |                          |
| Female                            | 6029  | 58    | 1947 | 65    |                          |
| Intersexual                       | 4     | 4     | 0    |       |                          |
| Missing                           | 16    | 1     |      |       |                          |
| University                        |       |       |      |       |                          |
| KU Leuven                         | 4812  | 46    | 1529 | 51    | 32                       |
| Vrije Universiteit Brussel        | 815   | 8     | 174  | 6     | 21                       |
| UGent                             | 3070  | 30    | 847  | 28    | 28                       |
The potential target population consists of 42.1% men and 57.9% women, whereas the study population consists of 35% men and 65% women. The sex ratio in the study population was not equal to the initial target population according to a chi-square test of goodness-of-fit ($p < 0.001$).

## 2. Incidence of sexual violence in medical students and trainees

Within the total study population, 1168 of 3015 participants (38.73%) reported having been victim of at least one type of sexual violence as explored by our survey. This percentage was the highest in GP trainees (53%), followed by specialist trainees (50%) and master students (39%) (table 2). A difference is observed between the relative frequency of incidents reported in male (21%) and female (48%) respondents.

### Table 2 Distribution of reports of sexual violence

|                  | Yes | No  |
|------------------|-----|-----|
|                  | n   | %   | n   | %  |
| Total            | 1168| 39  | 1847| 61 |
| Gender           |     |     |     |    |
| Male             | 221 | 21  | 827 | 79 |
| Female           | 938 | 48  | 1009| 52 |
| Study level      |     |     |     |    |
| Bachelor         | 237 | 25  | 704 | 75 |
| Masters          | 415 | 39  | 645 | 61 |
| ASO: Specialist trainee | 349 | 50  | 349 | 50 |
| HAIO: GP trainee | 167 | 53  | 149 | 47 |

$^1$number of participants reporting at least 1 type of behaviour defined as sexual violence; % = percentage of participants responding yes or no in each category
2.1. Hands-off sexual violence

Of the respondents, 32.9% (n = 153 men, n = 831 women) reported at least one experience of comments on physical appearance or disrespectful (derogatory, belittling) jokes. Patients (54.4%), medical staff members (46.6%), (fellow) students (26.7%), supervisors (25.5%) and paramedic personnel (20.1%) were identified as perpetrators (table 3). The hierarchical position of the specific person exhibiting the behaviour (27.7%) and the inability to flee from the situation (20%) were most frequently reported as circumstances facilitating this behaviour.

Five percent (n = 48 men, n = 95 women) of the respondents reported having received unwanted sexually tinted texts or images. Moreover, being asked to undress (with or without images being taken) or (being witness to) unwarranted undressing was reported by 1.5% (n = 9 men, n = 32 women) of the respondents. Patients were cited as perpetrator in 55% of these cases. In 28.6% of cases this happened more than once.

| Table 3. Number of respondents reporting each type of hands-off sexual violence being committed by each perpetrator |
|---------------------------------------------------------------|
| Total | Student | Trainee | Medical staff | Supervisor | Paramedical staff | Patient | Others |
|-------|---------|---------|---------------|------------|------------------|---------|--------|
| N     | N %     | N %     | N %           | N %        | N %              | N %     | N %    |
| Inappropriate remarks | 992 | 94 9 | 171 17 | 462 47 | 253 26 | 199 20 | 540 54 | 47 5 |
| Sexting | 145 | 31 21 | 13 9 | 18 12 | 5 3 | 14 10 | 21 14 | 38 26 |
| Remove clothes | 42 | 7 17 | 2 5 | 7 17 | 1 2 | 0 0 | 23 55 | 3 7 |

2.2 Hands-on sexual violence

Of the respondents, 3.7% (n = 30 men, n = 73 women) had experienced an unwanted attempt to kiss. In 21% of the cases this happened more than once. Moreover, 8.7% (n = 44 men, n = 203 women) were touched or somebody tried to touch him/her without consent. In 39% of cases this happened more than once and in 4% this happened regularly.

There were ten reports (n = 4 men, n = 5 women, n = 1 unknown) of (an attempt at) unsolicited oral sex (passive or active). The inability to escape from the situation (n = 1), use of alcohol or drugs (n = 2) and physical violence (n = 1) were cited as circumstances facilitating this behaviour.
There were nine reports (n = 3 men, n = 5 women, n = 1 unknown) of (an attempt at) unwanted sexual penetration. The (hierarchical) position of the person exhibiting the behavior (n = 1), the inability to flee from the situation (n = 3), use of alcohol or drugs (n = 2) and physical violence (n = 1) were cited by these victims. Of the participants, two male respondents reported both unwanted oral sex and penetration.

The percentage of type of perpetrator of this behaviour can be found in table 4.

### Table 4. Number of respondents reporting each type of hands-on sexual violence being committed by each perpetrator

|                  | Total | Student | Trainee | Medical staff | Supervisor | Paramedical staff | Patient | Others |
|------------------|-------|---------|---------|---------------|------------|-------------------|---------|--------|
| N                | N     | N %     | N %     | N %           | N %        | N %               | N %     | N %    |
| Kissing          | 105   | 44      | 42      | 9             | 12         | 11                | 3       | 3      | 5      | 5      | 17    | 16    | 13    | 12    |
| Touching         | 249   | 34      | 14      | 27            | 11         | 87                | 35      | 33     | 13     | 24     | 10    | 80    | 32    | 16    |
| Oral sex         | 10¹   | 1       | 10      | 0             | 0          | 0                 | 0       | 0      | 1      | 11     | 0     | 10    | 1     | 10    |
| Vaginal/anal penetration | 9²   | 5       | 56      | 0             | 0          | 1                 | 11      | 0      | 0      | 1      | 11    | 0     | 0     | 1     |

¹ 3 unknown; ² 1 unknown

### 3. Differences in incidence of sexual violence between men and women

Women reported significantly more (p < 0.001 and OR = 4.36) instances of sexist remarks or jokes compared to men. They also reported significantly more (p < 0.001 and OR = 2.69) unwanted (attempts at) physical contact. For other types of sexual violence, no significant differences between frequencies of incidents reported by men and women were observed.

### 4. Immediate reaction to sexual violence

In most types of sexual violence, no immediate reaction followed the unwanted behaviour. Except for kissing (53%), the amount of cases in which somebody reacted was inferior to 40%, ranging from around 37% in case of unwanted touching or undressing to barely 22% in the case of unwanted penetration.

In most cases (>80%) this reaction was by the victim him/herself. Other persons were more likely to react to inappropriate remarks (45% of reactions, most often by paramedic staff, trainees and supervisor) and unwanted touching (35% of reactions, most often by students, medical staff or
In cases of unwanted oral sex or penetration, there never was a reaction of somebody else than the victim. The type of reaction, categorised according to the 4 D’s of bystander reactions, differed from behaviour to behaviour (figure 1). Direct reaction and distraction were the strategies used most often. Not many incidents were reported to higher instances. There were no statistically significant differences observed in the amount or type of reactions to sexual violence according to the perpetrator categories.

![Figure 1 Type of response to sexual violence in the cases where somebody reacted.](image)

### 3.3 Disclosure of sexual violence

After having experienced sexual violence, women (57.3%) more often than men (39.7%) disclosed what happened. Most often, victims talked about what happened with a friend or family (92.21%). In 15% of cases they talked with a trust person outside of their inner circle. In 12 cases (2.5%) professional help was consulted and in 7 cases (1.5%) the authorities were notified of the event.

### 4. Indirect exposure to sexual violence

More than one tenth (12.8%, n = 386) of the study population witnessed potential sexual violence towards another medical student or trainee colleague. In 56% of cases this behaviour was by a medical staff member (n=215) and in 22% of cases this behaviour was by a supervisor (n=83). Other reports involved patients (18%), trainees (18%), paramedical staff (12%) and students (10%) as perpetrator.
After witnessing potential sexual violence, 48.7% asked about the feelings of the person who underwent the situation afterwards, almost one third (33.7%) undertook no action, 27.7% tried to distract the perpetrator, 5.9% took direct action by intervening or calling out the behaviour and 3.4% notified a superior.

5. Knowledge of support mechanisms and resources in case of sexual violence

Only 40% of respondents says to know how to handle or what to do when they experience sexual violence. However, 60% of respondents indicate not to know how to handle these matters. Moreover, 62.8% of respondents do not know how to help somebody who tells him/her that he/she has experienced undesirable behaviour, nor know which instances are able to help or give support in this situation (65.1%).

Discussion

In this study, nearly 2 out of 5 respondents reported having been victim of at least one type of sexual violence as explored by our survey. This indicates sexual violence in medical students and postgraduates is a relatively frequent problem. Respondents most frequently complained about comments on physical appearance or disrespectful jokes. In both hands-on and hands-off sexual violence, sexual violence was most frequently committed by students, patients and medical staff. The hierarchical position of the assailant and the inability to flee from the situation are two of the most reported facilitating circumstances for sexual violence to take place. This confirms that the competitive atmosphere during medical training makes medical trainees more susceptible to sexual violence and the hierarchical structure of a hospital scares students or trainees to speak up. These results are similar to the results of a study in Dutch medical students.[13] However, the incidence is lower than in other countries, for example in the US, with a prevalence of 33.3% in medical students and 36.2% in residents.[5] The European study of Krahé et al. shows that the prevalence in medical students is higher compared to other young adults (aged 18-27).[14]
There is a relatively large amount of reports of sexual violence by patients. Medical practitioners (including students) frequently have physical contact with patients and need to cross personal boundaries, putting them at risk of sexual violence. Sexual violence by patients was seen in a study in the Netherlands as well, where two thirds of incidents of sexual violence against medical students concerned patients.[15] Other reports involving physicians confirm sexual violence by patients is a frequent problem.[16, 17] Medical professionals focus on how to make the patient better without questioning a patient’s behaviour. Speaking up against undesired and inappropriate behaviour exhibited by patients is not a routine part of medical education. Physicians and trainees must learn to accept that patients, like all people, are sexual individuals, and certain behaviour can be a manifestation of this. However, there is a definite line between acceptable and non-acceptable behaviour. These boundaries are taught by experience, which might make them difficult to apply for students and postgraduates at the beginning of their careers.

Because this study did not question the study level of the respondents at the time of the reported behaviour, we cannot compare the incidence of sexual violence between undergraduate, graduate and postgraduate students. It is possible that the respondents reported events that happened earlier in their training. This is also reflected by an increase in reports as students advance in their careers and are more exposed to the workplace.

GP trainees reported the highest percentage of sexual violence. This might be explained because of the isolated and intimate relationship they have with their supervisor working at a GP office. Considering that specialist postgraduate training is double the length of GP postgraduate training, this difference is even more remarkable.

Women reported significantly more incidents of sexist remarks or jokes and unwanted physical contact. The approximate 2:1 ratio in female:male reports was seen by Krahé et al. as well in another study in Belgium [14]. It appears in medical students this difference is even bigger compared to the Krahé paper (48% vs 21%).
In only 20-30% of cases of sexual violence, someone reacted immediately to the event. This reaction was mostly from the victim him/herself. Most often this reaction was a direct action or distraction. This might be because most people do not know how to react, which is confirmed in this study. It is also possible that bystanders are scared to respond to the behaviour, because of the position of the perpetrator or because of peer pressure. When somebody other than the victim responded, it was mostly indirect action, by asking how the victim felt after the event. In the cases of unwanted oral sex or penetration, no immediate reaction was reported by somebody else. This could be explained by the fact that the victim was alone with the perpetrator at that moment. It should be noted as well that most types of behaviour did not receive any reaction at all. After experiencing sexual violence, about half of the victims talked about the event with someone else, mostly friends or family. This can be of importance because these persons might encourage the victim to report the incident, whilst the victim might not have done this if he/she did not disclose.

More than one tenth of the respondents witnessed sexual violence of another medical student or colleague. Two third of these persons reacted to this behaviour, mostly by asking about the feelings of the person who underwent the situation, but one third undertook no action. It is possible that there is a retention bias, where respondents have forgotten or don’t want to remember those occurrences of sexual violence where they did not react.

More than two third of respondents acknowledges not to know what to do when personally experiencing sexual violence, and 60% of respondents does not know how to react as a direct or indirect bystander nor where to get help with or report sexual violence when they are a witness.

As this study shows sexual violence is a frequent problem in medical trainees, it is worrisome that a lot of them (more than 50%) do not know where they can report or get support. In Belgium, there are contact points at each medical school as well as governmentally sanctioned contact points and care centres not related to medical school where victims can find help in any form after sexual violence. Unfortunately, these contact points are poorly known by students and postgraduates. A first step to fight sexual violence, is to make students more aware of their existence, functioning and role.
Secondly, their functioning must be screened for weak points and possible issues such as lack of accessibility for medical students and trainees. In addition, most respondents indicate not to know how to react when witnessing sexual violence. Bystander roles have proven to be an effective source of primary, secondary and tertiary prevention. [18–20] This is also reflected by the fact that in one third of the cases of sexual violence, nobody reacted. Therefore, this subject should be addressed in the training and all university and hospital personnel should also receive a training in bystander roles. More reaction to possible sexual violence shows that such behaviour is not accepted, thereby possibly lowering its incidence. Notwithstanding the results, our study has several limitations that should be mentioned. The total response rate of our survey within the target population is 29.8%. This target population consists of all undergraduate, graduate and postgraduate medical students. However, our goal was to focus on internship-related sexual violence. Therefore, those (undergraduate) students indicating that they had not participated in any internship yet were disqualified. This means that the target population consists of both potential respondents as well as disqualifying respondents. It is impossible to calculate the exact target population, although we can presume this comes down to about one third of the bachelor students (first year students have no internship experience). Therefore, the real response rate is slightly higher. There is an inherent possibility of selection bias as well: possibly the respondents are the ones that have been the victim of sexual violence and have a need to talk about it. However, there is also the possibility of the opposite case where participants that have been victim of sexual violence will not respond to the survey because they feel ashamed or don’t want to relive their trauma. Some of the missing answers might be explained by respondents who experienced sexual violence and stopped completing the questionnaire because of the emotions that were raised whilst responding. Another weakness of our study is that the questionnaire was distributed by the faculty administration, which might have a deterring effect on possible respondents. This study did not further investigate the detailed circumstances in which the sexual violence occurred. This means that behaviour exhibited by cognitively impaired patients - such as patients suffering from
dementia or patients under the influence of alcohol - is not researched in this result. We wanted to focus our study on sexual violence related to the status of being a medical student, but this can be interpreted broadly. A lot of sexual violence is not workplace-related however, and this will not be detected by our study. However, we did observe 25% of undergraduate students reporting workplace related sexual violence which is remarkably high with regards to their limited internship experience (<1 month).

For future research, it is important to keep monitoring the prevalence of sexual violence in this population, to keep track of the evolution and to further investigate in which context sexual violence occurs. Doing this, better tools can be developed to prevent such behaviour. It would be interesting to investigate the prevalence of sexual violence in other healthcare workers and students, such as nursing students, to see if sexual violence is a problem in these groups as well.

Conclusion

Sexual violence is a frequent issue in young people and medical students around the world with a big impact on performance and personal wellbeing. With this study, we firstly wanted to investigate whether sexual violence was frequently reported in the workplace context of medical undergraduate, graduate and postgraduate students. We also wanted to know more about the context in which this behaviour happened and who the perpetrator was. Secondly, we wanted to inquire whether a reaction took place against this behaviour and what this reaction consisted of. We investigated indirect exposure to sexual violence as well. Finally, we also wanted to investigate if students have knowledge of possible bystander reactions and support resources after sexual violence.

We saw that sexual violence is indeed an important issue in medical students and trainees. In about one third of occurrences of sexual violence, nobody reacted. When looking into the knowledge of possible bystander reactions and supporting instances for victims and witnesses of sexual violence, 60% of respondents acknowledged not to be aware.
List of abbreviations

ASO: arts-specialist in opleiding, specialist trainee
HAIO: huisarts in opleiding, GP trainee

Declarations

Ethics approval and consent to participate
This study was approved after review of the study protocol and survey contents by the ethical board of the UZ Brussel university hospital on 18-03-2019 with the B.U.N. 143201837964. Consent was given by the participants at the start of the survey (before any data was collected).

Consent for publication
Not applicable

Availability of data and materials
The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests
The authors declare that they have no competing interests.

Funding
This research was funded by the VGSO membership fees, paid for by the four universities according to the number of students, and by the VVS, the general Flemish student representation organ across all higher education instances.

Authors' contributions
JT developed the idea for the study, as president of the VGSO, and secured funding for the project next to writing the initial study protocol and taking the lead in all stages of data collection, processing and
article writing. LD and MH were involved from the beginning and responsible for the data analysis and statistical processing. MG was involved in the conception of the study and responsible for the discussion by doing a literature review as well as interpreting the results and placing them into context. NP helped writing the initial study protocol and subsequent amendments for approval by the ethics board as well as critically overseeing the article development and data interpretation. IK was responsible for giving the scientific background to the project by using her extensive knowledge on the subject to design the survey and help us process and interpret the results next to critically overseeing the article development.

Acknowledgements

We would like to acknowledge all the delegation leaders of the VGSO who defended the survey in their faculty: Maarten Claes for KU Leuven, Nicolas Degryse for UHasselt, Matthias Hoffman for University of Antwerp and Laura Dewulf for Ghent University.

References

1. World Health Organization, United Nations Office on Drugs and Crime (UNODC). Strengthening the medico-legal response to sexual violence. 2016. who.int/reproductivehealth/publications/violence/medico-legal-response/en/ Accessed 06Oct.2019.

2. Keygnaert I, Van Melkebeke I. Care for victims of sexual assault : guide for significant others. Ghent; 2018.

3. Komaromy M, Bindman AB, Haber RJ, Sande MA. Sexual harassment in medical training. N Engl J Med. 1993;328:322–6.

4. Jagsi R, Griffith KA, Jones R, Perumalswami CR, Ubel P, Stewart A. Sexual Harassment and Discrimination Experiences of Academic Medical Faculty. JAMA. 2016;315:2120–1.

5. Fnais N, Soobiah C, Chen MH, Lillie E, Perrier L, Tashkhandi M, et al. Harassment and Discrimination in Medical Training. Acad Med. 2014;89:817–27.

6. Paula A. Johnson, Sheila E. Widnall and FFB. Sexual Harassment of Women. Washington, D.C.:
7. Dzau VJ, Johnson PA. Ending Sexual Harassment in Academic Medicine. N Engl J Med. 2018;379:1589–91.

8. Tang AL, Seiden AM. Sexism and Sexual Harassment: Considering the Impact on Medical Students, Residents, and Junior Faculty. Laryngoscope. 2018;128:1985–6.

9. Depraetere J, VandeViver C, Beken T Vander, Keygnaert I. Big Boys Don’t Cry: A Critical Interpretive Synthesis of Male Sexual Victimization. Trauma Violence Abuse. 2018: 20. doi: 10.1177/1524838018816979.

10. Keygnaert I, Depraetere J, De Schrijver L, Nobels A, Inescu A, Vandevyver C, Nisen L, Lemonne A, Renard B, Krahé B, Beaulieu M, Peterson Z VBT. Understanding the Mechanism, Nature, Magnitude and Impact of Sexual Violence in Belgium (UN-MENAMAIS) Questionnaire. 2018. https://www.belspo.be/belspo/brain-be/projects/UN-MENAMAIS_en.pdf. Accessed 06 Oct. 2019.

11. Krahé B, Berger A. Men and women as perpetrators and victims of sexual aggression in heterosexual and same-sex encounters: A study of first-year college students in Germany. Aggress Behav. 2013;39:391–404.

12. Mujal GN, Taylor ME, Fry JL, Gochez-Kerr TH, Weaver NL. A Systematic Review of Bystander Interventions for the Prevention of Sexual Violence. Trauma, Violence, Abus. 2019:152483801984958.

13. van den Muijsenbergh METC, Lagro-Janssen ALM. [Sexual harassment of medical students during their period of work placement]. Ned Tijdschr Geneeskd. 2005;149:764–8.

14. Krahé B, Berger A, Vanwesenbeeck I, Bianchi G, Chliaoutakis J, Fernández-Fuertes AA, et al. Prevalence and correlates of young people’s sexual aggression perpetration and victimisation in 10 European countries: a multi-level analysis. Cult Health Sex. 2015;17:682–99.

15. Rademakers JJDJM, van den Muijsenbergh METC, Slappendel G, Lagro-Janssen ALM, Borleffs JCC. Sexual harassment during clinical clerkships in Dutch medical schools. Med Educ. 2008;42:452–8.

16. Vargas EA, Brassel ST, Cortina LM, Settles IH, Johnson TRB, Jagsi R. #MedToo: A Large-Scale Examination of the Incidence and Impact of Sexual Harassment of Physicians and Other Faculty at an
17. Viglianti EM, Oliverio AL, Meeks LM. Sexual harassment and abuse: when the patient is the perpetrator. Lancet (London, England). 2018;392:368–70.

18. McMahon S, Banyard VL. When can I help? A conceptual framework for the prevention of sexual violence through bystander intervention. Trauma Violence Abuse. 2012;13:3–14.

19. Powell A. Review of bystander approaches in support of preventing violence against women. 1st edition. Carlton: Victorian Health Promotion Foundation; 2011.

20. Edwards KM, Banyard VL, Sessarego SN, Waterman EA, Mitchell KJ, Chang H. Evaluation of a Bystander-Focused Interpersonal Violence Prevention Program with High School Students. Prev Sci. 2019;20:488–98.