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Patient-physician aggression in Belgium: physician characteristics and aggression types

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Patient-physician aggression in Belgium: physician characteristics and aggression types

Running title: Patient-physician aggression

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All authors declare no support from any organisation for the submitted work, no financial relationships with any organisations that might have an interest in the submitted work in the previous three years, no other relationships or activities that could appear to have influenced the submitted work.

Transparency declaration

The lead author (the manuscript's guarantor) affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned have been explained.

Ethics committee approval

A statement is included in the manuscript, including the name of the committee granting approval.

Clinical trial registration

This study is a cross-sectional survey and no intervention was planned or done. For these reasons the study for not registered as a clinical trial.

Role of the funding source

The study was unfunded.

Data sharing statement

Additional unpublished data from the study are available to all authors. They will be used to write two more papers on the characteristics of the patient/aggressor and on the preventive measure against patient-physician aggression.

The contributions of the different authors to this manuscript are as follows: -

1. Lennart De Jager: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
2. Michel Deneyer: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
3. Ronald Buyl: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
4. Sophie Roelandt: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
5. Ralph Pacqueu: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
6. Dirk Devroey: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted

Summary boxes

Section 1: What is already known on this topic

- Aggression directed against physicians is a growing problem in many countries.
- Little effort has been made to quantify the problem of aggression directed against physicians in a nation-wide study.

Section 2: What this study adds

- More than 80% of Belgian physicians report experiencing patient aggression during his or her career.
- During the preceding 12 months, one in three Belgian physicians experienced aggression within the physician-patient relationship.
- Those most at-risk of aggression are young, female, and French-speaking physicians who work in outpatient, emergency, or psychiatric settings.

ABSTRACT

Objectives: The aim of this Belgian research study was to describe the characteristics of physicians who are at increased risk for patient-physician aggression. Secondly, aggression subtypes were described.

Design: Cross-sectional survey

Setting: Primary and secondary care in- and outside hospitals

Participants: Any physician who had worked in Belgium for the preceding 12 months was eligible to participate.

Main Outcome Measures: An online, original questionnaire was used to obtain physician characteristics (eg, age, sex, native language), specialty, working conditions and contact with aggressive patients during their career and during the preceding 12 months.

Results: In total, 3,726 physicians completed the entire questionnaire. During the preceding 12 months, 1,372 physicians (37%) had been victims of aggression: 33% experienced verbal aggression, 30% psychologic, 14% physical, and 10% sexual. Women, younger physicians, and French-speaking physicians were more likely to experience aggression. Psychiatric departments and emergency departments were the settings most commonly associated with aggression. Physicians who provided primarily outpatient care were more subject to aggression.

Conclusion: Belgian physicians experience several forms of aggression. Those most at-risk of aggression are young, female, and French-speaking physicians who work in outpatient, emergency, or psychiatric settings.

Keywords: violence, aggression, patient-physician relationship

Strengths and limitations of this study

1. This study is the largest ever to address the topic of patient-physician aggression, with twice as many participants as the next largest similar study in other countries.
2. Only physicians with internet access could complete the survey but most Belgian physicians use a computer as part of their medical practice.
3. To ensure privacy, physician specialty and geographic location of their practice or hospital were not collected.
4. Classifications of aggression and violence are subjective and susceptible to varying interpretations.

INTRODUCTION

On December 1, 2015, 64-year-old family physician Patrik Roelandt was murdered during a house call to a patient. The murderer was known to the police and had a past criminal record, of which his physician was unaware. He is only one of many physicians who have experienced patient-physician aggression and violence. The physician-patient relationship is complex and based on mutual trust, with physicians serving as helpers and patients as care-seekers. There is often a very small difference between patient assertiveness and aggression in the physician-patient relationship.

International aggression research

In 2000, the World Health Organization, in collaboration with the International Labour Office, the International Council of Nurses, and Public Services International, investigated workplace violence in the healthcare sector.[1] For that study, a research tool was designed to assess workplace violence experienced by physicians and other healthcare workers.[2] Di Martino used this same tool in 2002 to synthesize the results of rural studies of violence against healthcare workers in several countries.[3] One of his conclusions was that more attention was needed to address aggression in nearly all countries studied. Furthermore, a report with preventive guidelines was prepared based on the results of these studies.[4]

In 2014, the International Society of Orthopaedic Surgery and Traumatology (SICOT) statement in Hyderabad, India called on governments to provide better registration systems, awareness of aggressive populations, stricter penalties, and protections for healthcare workers.[5 6]

In 2016, a review was published about the current state of aggression against healthcare workers in the US.[7] Little was known at that time about aggression in primary care settings; emergency and psychiatric departments had been the most well-studied environments, and were thought to be the most dangerous. Physicians and other healthcare professionals were at risk, however. The authors suggested that stricter penalties be placed for perpetrators of violence against healthcare workers and that easy procedures should be implemented to

report incidents. After that report, several investigations were conducted to assess aggression in emergency departments in the US. About three-fourths of physicians in emergency departments reported experiencing some form of violence, and one-fourth of staff members felt unsafe.[8 9]

A large US study showed that 48% of female physicians experienced sex-based intimidation, and 37% had experienced sexual harassment during their careers.[10]

A large cross-sectional study of Canadian physicians showed that 98% had experienced minor aggression, 75% severe aggression, and 39% very severe aggression.[11]

In China, violence against physicians is a major problem.[12] We speculate that this violence is related to the healthcare organization system in China, but research on this subject is still ongoing.

A Japanese study found a relationship between patient-physician aggression and posttraumatic stress disorder, with a violence incidence of 0.20 x10-3 events per practice hour.[13]

In 2011, a cross-sectional study of aggression against Australian family physicians showed that, during the preceding 12 months, 58% had experienced verbal aggression, 18% material damage or theft, 6% physical aggression, 4% stalking, 6% sexual harassment, and 0.1% sexual violence.[14] Physicians with less professional experience were more likely to have experienced verbal aggression compared to their colleagues, and women were more likely to have experienced sexual harassment compared to men.

In 2005, a Dutch study reported sexual harassment during medical internship.[15] Another study reported that Dutch paediatricians with less professional experience were more likely to encounter patient-physician aggression.[16]

In 2015, a German study reported that 91% of family physicians had been victims of patient aggression during their careers, with 73% experiencing aggression during the preceding 12 months.[17] Serious aggression had been experienced by 23% of those physicians during their careers and 11% during the preceding 12 months. Most participants still felt safe at their practice site, but 66% of female and 34% of male respondents felt insecure on home visits.

Belgian aggression research

In 1998, researchers using a safety survey in Belgian hospitals showed that psychiatric departments had higher rates of patient-physician aggression.[18] Since starting their work in the psychiatric department, 38% of physicians had experienced theft, 13% physical aggression, and 70% verbal aggression. Although 86% of physicians surveyed reported that they did not feel unsafe at their hospital, female physicians did feel insecure in the evenings, and insecurity was more prevalent in hospitals where French was spoken compared to those where Dutch was spoken.

Since that study in 1998, several small surveys have been conducted, but none are representative of the Belgian population, and none have been published in scientific journals. Although there is sufficient evidence that physicians are at risk for patient aggression, little effort has been made to identify which physicians are at increased risk of aggression.

The aim of this study was to describe the characteristics of physicians who are at increased risk for patient aggression in Belgium. We investigated possible associations between specific types of aggression and physician characteristics, and whether aggression occurs more frequently in inpatient or outpatient settings.

METHODS

Questionnaire

An online questionnaire in Dutch and French was developed for this cross-sectional survey. The questionnaire was available from March 28, 2017 to April 25, 2017 on the LimeSurvey platform (Germany, Version 2.05+). Paper questionnaires were not provided. Participants had to read the online informed consent and agree to participate by clicking the corresponding key before they could participate in the study.

The questionnaire first asked participants which of the four major types of aggression the physician had experienced during his or her career and during the preceding 12 months.

Questions about the preceding 12 months were more detailed than the career questions. Physicians were also asked about aggression subtypes and places where aggression had occurred. Next, personal and demographic data were collected for each participant. To preserve participant privacy, questions were limited to sex, year of birth, number of years of practice, main practice activity, and number of co-workers. Based on these data, it should be impossible to track down which physicians completed the survey.

Participants

In Belgium, all physicians are required to register with the National Medical Council. The council sent an email to the 36,335 active registered physicians with a link to the survey and a request to complete the questionnaire. An initial email was sent on March 28, 2017 and a reminder email was sent on April 13, 2017. Only active physicians who had worked in Belgium for the past 12 months were eligible to participate in the study. Physicians also had to have computer access, an email address, and needed to understand Dutch or French.

Participant and public involvement

Neither patients nor public were directly involved in this study. The National Medical Council disseminated a report with general results to all study participants.

Difference between aggression and violence

The difference between aggression and violence is not always very clear. The terms aggression and violence are often used interchangeably, although the two are not synonymous. Both concepts are also subjective, with overlapping meanings that can be interpreted differently by different persons. Aggression is any behaviour that can potentially harm people or objects. This behaviour can occur at the physical or psychologic level. Aggression can manifest as abusive language, damage to objects, violent threats to others, or assaults on persons (including the aggressor himself or herself). Violence is physical assault with intent to harm. Not all aggression leads to violence; violence is a step further

than aggression. Throughout this paper, we preferentially use the term aggression. We consider four major classes of aggression: physical, verbal, psychologic, and sexual.

Ethical review

The protocol and questionnaire were reviewed by the Medical Ethics Committee of the University Hospital Brussels and approved on March 8, 2017.

Statistical analysis

Statistical analysis was completed using LimeSurvey, Microsoft Excel 2016, and IBM SPSS Statistics 24. Partially completed or unsaved questionnaires were not included in the analysis.

For the statistical analysis, variables were considered as independent (ie, explanatory or input) or dependent (ie, outcome or target).

Descriptive statistics are presented as frequencies (n, %) for categorical variables and medians (and interquartile ranges [IRs]) for continuous outcomes. Univariate analysis was performed using Chi-square tests or Fisher's exact test where appropriate. For ordinal variables, *P* values were calculated using the linear-by-linear association. The 95% confidence interval (CI) was calculated using the standard error (SE), as given by the formula $SE = \sqrt{[p\ (1-p) / n]}$. For large cross-tables with expected values less than five, the Fisher's exact test was used for subgroups using the Monte Carlo method (95% CI and 10,000 samples).

A logistic regression model was developed using aggression during career, aggression during the preceding 12 months, physical aggression, verbal aggression, psychologic aggression, and sexual aggression as dependent variables. Age (five groups), sex, language, years of practice experience (five groups), medical department, and number of colleagues (three groups) were used as independent variables. A stepwise backward (conditional) logistic regression was performed for each of these independent variables. All tests were performed using an α of 0.05.

RESULTS

Participant demographics

In total, 4,778 physicians participated in the study; however, 1,052 questionnaires were not included in the analysis because not all questions were answered. Demographic data for the 3,726 respondents who fully completed the questionnaire are shown in Table 1. Most respondents were male (52%), and most completed the survey in Dutch (67%). Their median age was 42 years and the median number of years in medical practice was 13. Both continuous variables had non-normal distributions, with *P* values of less than .0001 for both the Kolmogorov-Smirnov and the Shapiro-Wilk tests. Forty-two percent of respondents worked in a hospital, whereas 22% had a solo outpatient practice, and 18% were part of a group practice. Participants from nearly all medical specialties participated in the study. The most represented hospital departments were anaesthesiology (10.6% [n = 164]), radiology (8.7% [n = 134]), paediatrics (6.6% [n = 102]), orthopaedics (6.2% [n = 96]), and the emergency department (5.8% [n = 89]).

Prevalence

Table 2 shows the reported prevalence and types of patient-physician aggression. Multiple answers were allowed for responses, as participants may have experienced multiple types of aggression in multiple practice locations. Eighty-four percent of participants had experienced aggression during their careers, with 37% having this experience during the preceding 12 months. Of those who encountered aggression during the past 12 months, 91% experienced it in a consultation room, 34% outside the consultation room, and 39% during emergency medical services in hospitals or in primary care.

Differences between sexes

More women than men encountered patient-physician aggression during their careers (87% versus 82%; *P* < .0001) and during the preceding 12 months (43% versus 31%; *P* < .001). During their careers, more men than women had experienced physical aggression (27% and 21%, respectively; *P* < .001), whereas more women than men had experienced psychologic aggression (35% and 49%, respectively; *P* < .001) and sexual aggression (4% and 17%, respectively; *P* < .001). There were no differences between men and women with respect to experience of verbal aggression during the careers.

Table 3 shows the proportion of participants who encountered patient-physician aggression during the preceding 12 months and the subtypes of aggression experienced by both men and women. During this period, women and men experienced similar rates of physical aggression, but verbal aggression was experienced by 38% of women compared to 28% of men (*P* < .001). Scolding and insulting were particularly common forms of verbal aggression against women. Women also experienced more psychologic aggression compared to men (38% and 28%, respectively; *P* < .001). Almost all subtypes of psychologic aggression were more frequently experienced by women. Sexual aggression was experienced by 15% of female physicians compared to 5% of male physicians (*P* < .001). Of the sexual aggression subtypes, only sexual remark aggression occurred more commonly among women than men.

During the preceding 12 months, more women (40%) than men (28%) experienced aggression in their own consultation rooms (*P* < .001). Women also encountered more aggression compared to men during on-call duties (17% compared to 12%; *P* < .001).

Patient aggression by language spoken

Dutch-speaking (n = 2,477) and French-speaking (n = 1,249) physicians experienced similar rates of aggression during their careers (85% and 84% respectively; *P* = .781) and during the preceding 12 months (36% and 38%, respectively; *P* = .561). However, compared to

those who spoke French, those who spoke Dutch experienced more verbal aggression (75% and 79%, respectively; *P* = .004) and sexual aggression (7% and 12%, respectively; *P* < .001) during their careers.

Table 4 shows the proportion of participants who experienced patient-physician aggression during the preceding 12 months and details the subtypes of aggression by language spoken. During the preceding 12 months, French-speaking physicians experienced more physical aggression than their Dutch-speaking colleagues. Those who spoke French more often reported severe physical violence (5% compared to 3%; *P* = .006) and damage or theft (9% compared to 7%; *P* = .012). Although the rate of verbal aggression did not differ between groups, physicians who spoke French experienced more threats of physical aggression (15% and 17%, respectively; *P* = .022). Although the rates of psychologic aggression did not differ, blaming and blackmailing were more commonly reported by the French-speaking participants (*P* = .013 and *P* < .001, respectively). Reports of sexual touching were more common for French-speaking participants (*P* = .041), whereas reports of patient sexual acts were more common for Dutch-speaking participants (*P* = .006).

With respect to location, French-speaking physicians were more likely to encounter aggression outside of their consultation rooms compared to their Dutch-speaking colleagues (15% and 11%, respectively; *P* = .001).

Patient aggression by physician age

Younger physicians were more likely to experience patient-physician aggression during the preceding 12 months (Figure 1), with 46% of those born in 1980 or later experiencing aggression, compared to 15% of those born before 1950 (*P* for trend < .001). This trend of increasing aggression with decreasing age was observed for all types of aggression. For physical aggression, the rate increased from 11% among the oldest physicians to 18% among the youngest physicians (*P* for trend < .001). Verbal aggression increased from 13% to 43% (*P* for trend < .001), and psychologic aggression increased from 11% to 39% (*P* for

trend < .001). Furthermore, sexual aggression increased from 4% to 14% (*P* for trend < .001).

During the preceding 12 months, a shorter length of professional practice was also associated with increasing rates of aggression (Figure 2).

Workplace and speciality

Physicians working in a solo practice (30%) encountered less aggression during the preceding 12 months compared to those working in a group practice (39%, *P* < .001), community health centre (52%, *P* < .001) or hospital (36%, *P* < .003). Workplaces with the highest risk for aggression during the preceding 12 months were psychiatric institutions (73%), centres for mental health (71%), health insurance companies (67%), and community health centres (52%).

The most dangerous work environments for aggression within hospitals were the emergency (82%), psychiatry (64%), neurology (58%), geriatrics (53%), and internal medicine (52%) departments. All other departments were associated with aggression reports of less than 50% during the past 12 months.

During their careers, 83% of participants providing inpatient care experienced aggression, compared to 85% of those providing outpatient care (*P* = .046). Those working outside a hospital were more likely to experience psychologic and sexual aggression compared to those working inside a hospital (45% versus 37%, *P* < .001; and 12% versus 8%, *P* < .001). During the preceding 12 months, outpatient and inpatient physicians reported similar rates of patient aggression (Table 5). However, those working inside the hospital reported more physical aggression compared to those working in outpatient settings (17% and 13%, respectively; *P* = .002). Moderate and severe physical aggression occurred more common inside the hospital. Verbal aggression and its subtypes occurred more frequently in the hospital compared to the outpatient setting (36% versus 31%; *P* = .002). There was no difference in the rate of psychologic aggression between outpatient and inpatient settings; however, manipulation or incitement to illegal actions was more common in outpatient than

inpatient settings (18% and 11%, respectively; *P* < .0001). Sexual aggression by patients toward physicians was also more common in outpatient (10%) compared to inpatient settings (8%; *P* = .03), especially for sexual acts by patients.

Practice structure was also associated with aggression. An increasing number of professional partners was associated increasing violence (*P* for trend < .001). All types of violence had a similar statistical trend (*P* < .001) except for sexual violence (*P* for trend = .015).

Logistic regression

In logistic aggression analysis, age or years of experience were correlated with aggression (Table 6). Each variable was related to a different form of aggression: younger age was related to physical aggression and increased aggression during the career, whereas fewer years of professional experience was related to other types of aggression.

Sex was a risk factor in five out of six logistics regression analyses, with females being more at risk for all types of aggression except physical aggression.

The number of professional colleagues was also positively associated with five out of six forms of aggression. Increasing numbers of professional partners was related to increasing risk for patient-physician aggression.

The inpatient setting was also related to most types of aggression, but it was not possible to determine from the logistic regression which departments were most at-risk because the variable was not ordinal. It was confirmed, however, that risk differs by hospital department.

DISCUSSION

Aggression during career

This research aimed to characterize the current state of patient aggression toward physicians in Belgium. During their careers, most physicians had experienced some type of aggression within the physician-patient relationship. Verbal aggression (77%) occurred most

commonly, but psychologic (42%), physical (24%), and sexual (10%) forms of aggression were also important. The rates of verbal, psychologic, and physical aggression were similar to those reported previously for physicians in Belgium and other countries.[11 17 18 19 20 21] The reported rates of sexual aggression were significantly lower than those reported in previous Belgian and international studies, however.[10 20 21]

During their careers, women were slightly more likely than men to experience aggression. Men were more likely to experience physical aggression, whereas women were more likely to experience psychologic and sexual aggression. Our findings are consistent with previous Belgian surveys showing more frequent sexual aggression toward female physicians.[19 20 21] However, we found a much lower rate of sexual aggression against women physicians during their careers than previously reported in international studies. [19 20 21]

Overall, there were no differences in aggression based on spoken language, although sexual violence was more commonly experienced by Dutch-speaking physicians compared to their French-speaking colleagues (12% versus 7%).

Our finding that aggression occurred less commonly during physicians' careers in solo practice compared to community health centres and group practice differed from that of a previous Belgian survey.[21] One may hypothesize that a work setting with several colleagues may be protective against aggression; however, our findings do not support this hypothesis. Working with five or more colleagues appears to be an independent risk factor for aggression. Settings such as community health centres may attract more patients with problematic socio-economic backgrounds; thus, these patients may be more likely to express their demands or emotions with aggression. However, multivariate analysis did not show that physicians working in a community health centres are at increased risk for aggression, which seemed primarily related to number of colleagues, independent of practice type.

Psychiatric institutions were significantly more dangerous workplaces compared to general hospitals, where emergency departments were the most at-risk areas for experiencing aggression. Nearly all physician participants reported that they had experienced aggression

during their careers. The finding of higher risk of aggression in psychiatry and emergency departments is consistent with previous studies.[7 18]

Physicians who practiced primarily in outpatient settings were more likely to encounter violence during their careers compared to those who practiced primarily in the hospital. More specifically, outpatient physicians were more likely to experience psychologic and sexual aggression.

Aggression during the preceding 12 months

The logistic regression showed that female sex, younger age or fewer years of experience, a higher number of colleagues, and hospital department were independent risk factors for aggression during the preceding 12 months.

Our study also aimed to describe the various subtypes of aggression encountered by physicians during the 12 months preceding survey administration. Our study showed that 37% of physicians had experienced patient aggression (verbal, 33%; psychologic, 30%; physical, 14%; and sexual, 10%) during the preceding 12 months. These rates were lower than those reported for studies in other countries.[14 17]

The finding that most physicians experienced aggression within their consultation room may be explained by the fact that physicians surveyed spent most of their professional time in their outpatient practice settings. In that setting, more than one type of aggression was frequently reported. Psychologic and verbal aggression often co-occurred.

During the preceding 12 months, women were more likely than men to experience aggression (43% versus 31%). Consistent with a previous report, women were more likely to experience verbal (38% versus 28%), psychologic (36% versus 24%), and sexual (15% versus 5%) aggression compared to men.[14] Women were also more likely to experience aggression in their own practices (40% versus 28%) and during on-call duties (17% versus 12%).

Native language was not associated with most measures of patient-physician aggression, although French-speaking physicians more often experienced severe physical aggression (5% versus 3%) and blackmailing (13% versus 6%).

Our finding that all forms of aggression were experienced more commonly by younger physicians and by those with little practical experience is consistent with results from published international studies.[14 16]

Physicians in solo practice reported less aggression during the preceding 12 months compared to those in group practice and community health centres. Those working in psychiatric institutions had the highest risk for patient aggression among outpatient physicians. In hospitals, the emergency department was the most likely site of aggression. Overall, there were no differences in reported aggression during the preceding 12 months for inpatient and outpatient settings. Physical aggression (especially mild and severe physical aggression) and verbal aggression occurred more frequently among physicians whose primary practice was in the hospital. In contrast, sexual aggression was experienced more commonly by physicians who practiced in outpatient settings. The finding that those who practice in outpatient settings experience more aggression may relate to their role as family physicians who make more frequent home calls compared to specialists.

Recommendations for prevention

Preventive action should be focused initially on high-risk groups: young female physicians who work in psychiatric facilities, emergency departments, and community health centres. Campaigns should focus not only on sexual aggression, but other forms of aggression that are frequently encountered by female physicians.

Demographic changes in the physician population should also be considered. As the percentage of female physicians increases, preventive measures should focus on female physicians to reverse the trend of increasing patient-physician aggression.[17 22]

The high rate of patient-physician aggression found in our study differs greatly from the actual number of cases of aggression that are officially reported. To the best of our

knowledge, less than 100 cases of patient-physician aggression are reported each year to the National Medical Council. This serious under-reporting needs to be addressed. Physicians should be encouraged to report every case of aggression to the police, the national call point of the National Medical Council, and possibly to an internal local call point. Reporting should be promoted, among other means, by a national awareness campaign.

Strengths and limitations

This study enrolled many Belgian physicians from a diverse geographical area and all medical specialties. Despite the low response rate of 9.98% (3,627 of 36,335 invited physicians participated), the present study is the largest ever to address this topic, with twice as many participants as the next largest similar study in other countries.[17 23] Our study population was sufficiently large to show statistical differences, even among smaller subgroups.

Because no paper questionnaires were used, only physicians with internet access could complete the survey. However, no bias is expected from this limitation, as most Belgian physicians use a computer as part of their medical practice.

A second limitation is the demographic data collected for study participants. To ensure privacy, we only collected information that could not be used to identify specific physicians. Consequently, physician specialty and geographic location of their practice or hospital were not collected. In this study, only the main activity and the location of the aggression were collected, per the regulations of the medical ethics committee. Thus, a direct comparison between family physicians and specialists was not possible. Instead, physicians working in hospitals (primarily specialists) were compared to those working in outpatient settings (primarily family physicians).

Lastly, classifications of aggression and violence are subjective and susceptible to varying interpretations. Participants may have differing views of what behaviours constitute aggression. Efforts were made to minimize subjectivity in this area by providing survey participants with explanations of aggression classifications and subtypes.

Future research

There are still no exact figures about the incidence and trends of aggression against Belgian physicians and other medical professionals such as nurses or paramedics. Prospective cohort studies with representative study populations would be needed to further study this question. Preventive measures could then by designed and evaluated for effectiveness using prospective interventional research.

CONCLUSIONS

More than 80% of Belgian physicians report experiencing patient aggression during his or her career. Female physicians and those who are younger or less experienced are more likely to experience aggression during their careers. During the preceding 12 months, one in three Belgian physicians experienced aggression within the physician-patient relationship. Verbal aggression was reported most often, followed by psychologic, physical, and sexual aggression. Female and young physicians were more likely to experience aggression during the preceding 12 months compared to male and older physicians. Psychiatric institutions and emergency departments were the practice sites where physicians were most likely to encounter aggression. Multivariate logistic regression analysis confirmed the relationship between aggression during the preceding 12 months and female sex, younger age or less years of experience, a higher number of colleagues, and hospital department.

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Table 1. Participant demographics (n = 3,726)

Characteristic	% (n)
Gender	
Men	51,8% (1,930)
Women	48,2% (1,796)
Maternal language	
Dutch	66,5% (2,477)
French	33,5% (1,249)
Median age in years (IQR)	42 (22)
Median medical activity in years (IQR)	13 (21)
Type of medical activity	
Solo practice	22,1% (822)
Duo practice	7,8% (290)
Group practice	17,5% (653)
Community Health Centre	2,1% (79)
Hospital	41,5% (1,545)
Psychiatric institution	2,5% (94)
Homes for the elderly	0,5% (19)
Health insurance company	1,0% (39)
Company control doctor	0,5% (20)
Community childcare centre	0,1% (4)
Prison	0,1% (5)
Occupational medicine	0,8% (28)
Community centre for mental health	0,4% (14)
School doctor	0,3% (10)
Medical expertise	0,2% (7)
Others	2,6% (97)
Number of collaborators in the practice	
0	27,9% (1,039)
1-5	36,2% (1,348)
≥5	35,9% (1,339)

Table 2. Prevalence and types of patient-physician aggression (N = 3,726)

Type of aggression	During career % (n)	During past 12 months %(n)
Total	84,4% (3,144)	36,8% (1,372)
Physical	24,2% (903)	14,4% (538)
Verbal	77,2% (2,877)	33,1% (1,235)
Psychic	41,7% (1,552)	30,0% (1,116)
Sexual	10,1% (378)	9,5% (353)
Other	1,5% (55)	1,4% (51)
None	15,6% (582)	63,2% (2,354)

Table 3. Types of patient aggression experienced by physicians during the preceding 12 months (N = 3,726)

Type of aggression	Men (*n*=1930)	Women (*n*=1796)	*p*-value
Total	30,9%	43,2%	<0,0001
Physical aggression	13,7%	15,3%	0,17
Mild physical aggression (such as pushing, gripping, spitting)	10,2%	10,3%	0,93
Heavy physical aggression (such as biting, kicking, hitting, strangulation)	4,1%	3,4%	0,27
Attack with object, weapon and / or animal	1,5%	2,1%	0,16
Damage to property and / or theft	6,6%	7,9%	0,15
Verbal aggression	28,3%	38,4%	<0,001
Threat with physical aggression	15,4%	15,5%	0,97
Scold and / or insult	27,0%	36,9%	<0,0001
Psychological aggression	24,1%	36,2%	<0,0001
Humiliation	7,6%	14,0%	<0,0001
Blaming and / or intentional guilt delivery	18,9%	31,2%	<0,0001
Threat with suicide and / or automutilation	10,0%	15,2%	<0,0001
Manipulation and / or incitement to illegal things	13,0%	17,0%	0,001
Chantage	6,9%	10,5%	<0,0001
Load and / or reproach	11,2%	10,4%	0,42
Sexual aggression	4,7%	14,6%	<0,0001
Sexual remarks	2,8%	13,0%	<0,0001
Sexual acts by themselves	0,2%	2,0%	<0,0001
Hold on	1,9%	2,9%	0,039
Sexual touch	0,6%	1,3%	0,023
Rape	0,1%	0,1%	1,00[a]
Stalking	1,9%	2,4%	0,27
Others	1,2%	1,6%	0,34
None	69,1%	56,8%	<0,0001

[a] Calculated using two-sided Fisher's exact test

Table 4. Types of aggression experienced by Dutch-speaking and French-speaking physicians during the preceding 12 months (N = 3,726)

Type of aggression	Dutch-speaking (*n*=2477)	French-speaking (*n*=1249)	*p*-value
Total	36,5%	37,5%	0,56
Physical aggression	13,9%	15,5%	0,21
Mild physical aggression (such as pushing, gripping, spitting)	9,9%	11,0%	0,31
Heavy physical aggression (such as biting, kicking, hitting, strangulation)	3,1%	5,0%	0,006
Attack with object, weapon and / or animal	1,5%	2,3%	0,06
Damage to property and / or theft	6,5%	8,7%	0,012
Verbal aggression	33,3%	32,9%	0,83
Threat with physical aggression	14,5%	17,4%	0,022
Scold and / or insult	31,9%	31,5%	0,83
Psychological aggression	29,5%	30,8%	0,41
Humiliation	11,0%	10,0%	0,36
Blaming and / or intentional guilt delivery	23,6%	27,3%	0,013
Threat with suicide and / or automutilation	12,9%	11,8%	0,33
Manipulation and / or incitement to illegal things	15,4%	13,9%	0,23
Chantage	6,4%	13,1%	<0,0001
Load and / or reproach	10,7%	11,0%	0,77
Sexual aggression	9,9%	8,7%	0,27
Sexual remarks	8,0%	7,3%	0,47
Sexual acts by themselves	1,4%	0,4%	0,006
Hold on	2,5%	2,2%	0,57
Sexual touch	0,7%	1,4%	0,041
Rape	0,1%	0,1%	1,00[a]
Stalking	2,0%	2,5%	0,36
Others	0,9%	2,2%	0,001
None	63,5%	62,5%	0,56

[a] Calculated using two-sided Fisher's exact test

Table 5. Types of patient aggression experienced by physicians providing inpatient and outpatient care during the preceding 12 months (N = 3,726)

Type of aggression	Inside hospital (*n*=1639)	Outside hospital (*n*=2087)	*p*-value
Total	38,3%	35,7%	0,11
Physical aggression	16,5%	12,8%	0,002
Mild physical aggression (such as pushing, gripping, spitting)	14,0%	7,3%	<0,0001
Heavy physical aggression (such as biting, kicking, hitting, strangulation)	6,0%	2,0%	<0,0001
Attack with object, weapon and / or animal	1,6%	1,8%	0,69
Damage to property and / or theft	6,7%	7,7%	0,23
Verbal aggression	35,8%	31,0%	0,002
Threat with physical aggression	19,5%	12,3%	<0,0001
Scold and / or insult	34,5%	29,6%	0,001
Psychological aggression	30,1%	29,9%	0,88
Humiliation	10,9%	10,4%	0,64
Blaming and / or intentional guilt delivery	25,6%	24,2%	0,32
Threat with suicide and / or automutilation	13,3%	11,9%	0,19
Manipulation and / or incitement to illegal things	11,4%	17,7%	<0,0001
Chantage	8,7%	8,6%	0,87
Load and / or reproach	11,8%	10,1%	0,11
Sexual aggression	8,3%	10,4%	0,030
Sexual remarks	7,1%	8,3%	0,17
Sexual acts by themselves	0,6%	1,4%	0,020
Hold on	2,3%	2,4%	0,71
Sexual touch	0,6%	1,1%	0,09
Rape	0,0%	0,2%	0,14[a]
Stalking	1,9%	2,4%	0,30
Others	0,9%	1,7%	0,035
None	61,7%	64,3%	0,11

[a] Calculated using two-sided Fisher's exact test

Table 6. Logistic regression for aggression type

Variables	Sig.	OR	95% CI for OR
Aggression during the career			
Gender	0.007	0.679	0.512 – 0.901
Age	0.008	1.168	1.041 – 1.311
Number of collaborators	0.024	1.212	1.025 – 1.432
Aggression during the past 12 months			
Language	0.016	1.326	1.054 – 1.669
Gender	0.001	0.695	0.556 – 0.868
Years of experience	<0.001	0.775	0.702 – 0.855
Hospital department	0.001	1.012	1.005 – 1.019
Number of collaborators	0.003	1.250	1.081 – 1.446
Physical aggression during past 12 months			
Language	0.005	1.535	1.136 – 2.075
Age	<0.001	1.291	1.128 – 1.478
Hospital department	<0.001	1.020	1.010 – 1.030
Number of collaborators	0.004	1.350	1.099 – 1.659
Verbal aggression during past 12 months			
Gender	0.010	0.744	0.594 – 0.933
Years of experience	<0.001	0.781	0.706 – 0.863
Hospital department	0.001	1.012	1.005 – 1.020
Number of collaborators	0.011	1.211	1.045 – 1.404
Psychological aggression during past 12 months			
Language	<0.001	1.595	1.249 – 2.035
Gender	<0.001	0.647	0.509 – 0.822
Years of experience	<0.001	0.785	0.705 – 0.874
Hospital department	<0.001	1.014	1.006 – 1.022
Number of collaborators	0.001	1.311	1.119 – 1.535
Sexual aggression during past 12 months			
Gender	0.001	0.472	0.307 – 0.725
Years of experience	0.004	0.737	0.600 – 0.906
Hospital department	0.002	1.022	1.008 – 1.038

FIGURE LEGENDS

Figure 1. Patient aggression experienced by physicians during the preceding 12 months, by year of physician birth

Figure 2. Patient aggression experienced by physicians during the preceding 12 months, by number of years in practice

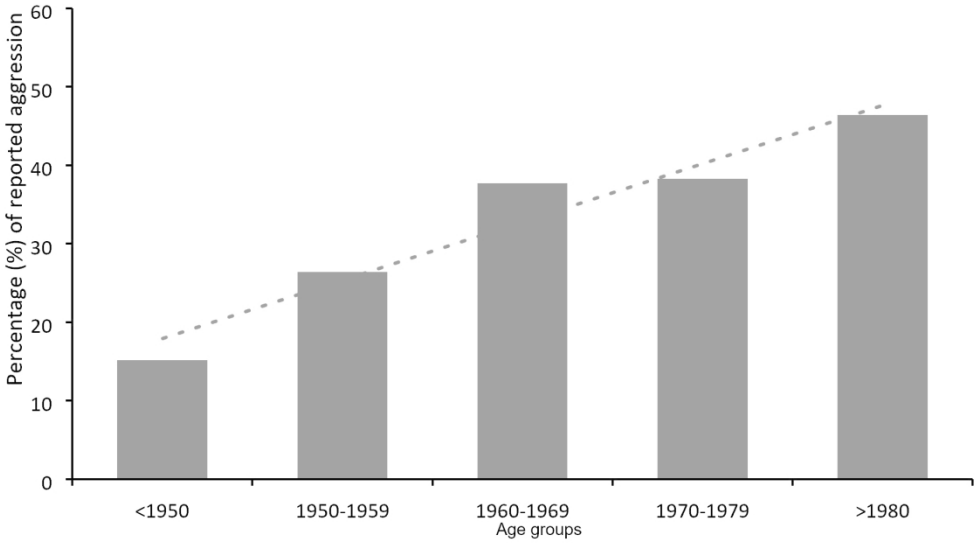

Figure 1. Patient aggression experienced by physicians during the preceding 12 months, by year of physician birth

169x97mm (300 x 300 DPI)

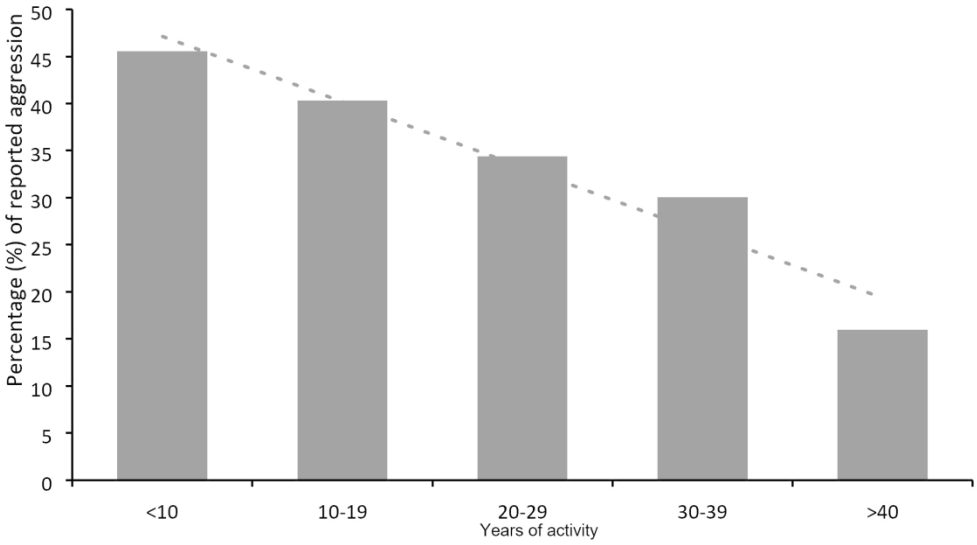

Figure 2. Patient aggression experienced by physicians during the preceding 12 months, by number of years in practice

169x97mm (300 x 300 DPI)

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A cross-sectional study on patient-physician aggression in Belgium: physician characteristics and aggression types

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A cross-sectional study on patient-physician aggression in Belgium: physician characteristics and aggression types

Running title: Patient-physician aggression

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Transparency declaration

The lead author (the manuscript's guarantor) affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned have been explained.

Ethics committee approval

A statement is included in the manuscript, including the name of the committee granting approval.

Clinical trial registration

This study is a cross-sectional survey and no intervention was planned or done. For these reasons the study was not registered as a clinical trial.

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The contributions of the different authors to this manuscript are as follows: -

1. Lennart De Jager: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
2. Michel Deneyer: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
3. Ronald Buyl: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
4. Sophie Roelandt: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
5. Ralph Pacqueu: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
6. Dirk Devroey: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted

ABSTRACT

Objectives: The aim of this Belgian research study was to describe the characteristics of physicians who are at increased risk for patient-physician aggression. Secondly, aggression subtypes were described and data were provide on the prevalence of patient-physician aggression in Belgium.

Design: Cross-sectional survey

Setting: Primary and secondary care in- and outside hospitals

Participants: Any physician who had worked in Belgium for the preceding 12 months was eligible to participate (N=34,648).

Main Outcome Measures: An online, original questionnaire was used to obtain physician characteristics (eg, age, sex, native language), specialty, working conditions and contact with aggressive patients during their career and during the preceding 12 months.

Results: The questionnaire was completed by 4,930 participants and 3,726 (76%) were valid to take into account for statistics. During the preceding 12 months, 37% had been victims of aggression: 33% experienced verbal aggression, 30% psychologic, 14% physical, and 10% sexual. Multiple answers were allowed. Women and younger physicians were more likely to experience aggression. Psychiatric departments and emergency departments were the settings most commonly associated with aggression. Physicians who provided primarily outpatient care were more subject to aggression.

Conclusion: Belgian physicians experience several forms of aggression. Those most at-risk of aggression are young and female physicians who work in outpatient, emergency, or psychiatric settings.

Keywords: violence, aggression, patient-physician relationship

Strengths and limitations of this study

1. This study is one of the largest ever to address the topic of patient-physician aggression.
2. Only physicians with internet access could complete the survey but most Belgian physicians use a computer as part of their medical practice.
3. To ensure privacy, physician specialty and geographic location of their practice or hospital were not collected.
4. Classifications of aggression and violence are subjective and susceptible to varying interpretations.

INTRODUCTION

On December 1, 2015, 64-year-old family physician Patrik Roelandt was murdered during a house call to a patient. The murderer was known to the police and had a past criminal record, of which his physician was unaware. He is only one of many physicians who have experienced patient-physician aggression and violence. The physician-patient relationship is complex and based on mutual trust, with physicians serving as helpers and patients as care-seekers. There is often a very small difference between patient assertiveness and aggression in the physician-patient relationship.

International aggression research

In 2000, the World Health Organization, in collaboration with the International Labour Office, the International Council of Nurses, and Public Services International, investigated workplace violence in the healthcare sector.[1] For that study, a research tool was designed to assess workplace violence experienced by physicians and other healthcare workers.[2] Di Martino used this same tool in 2002 to synthesize the results of rural studies of violence against healthcare workers in several countries.[3] One of his conclusions was that more attention was needed to address aggression in nearly all countries studied. Furthermore, a report with preventive guidelines was prepared based on the results of these studies.[4]

In 2014, the International Society of Orthopaedic Surgery and Traumatology (SICOT) statement in Hyderabad, India called on governments to provide better registration systems, awareness of aggressive populations, stricter penalties, and protections for healthcare workers.[5 6]

In 2016, a review was published about the current state of aggression against healthcare workers in the US.[7] Little was known at that time about aggression in primary care settings; emergency and psychiatric departments had been the most well-studied environments, and were thought to be the most dangerous. Physicians and other healthcare professionals were at risk, however. The authors suggested that stricter penalties be placed for perpetrators of violence against healthcare workers and that easy procedures should be implemented to

report incidents. After that report, several investigations were conducted to assess aggression in emergency departments in the US. About three-fourths of physicians in emergency departments reported experiencing some form of violence, and one-fourth of staff members felt unsafe.[8 9]

A large US study showed that 48% of female physicians experienced sex-based intimidation, and 37% had experienced sexual harassment during their careers.[10]

A large cross-sectional study of Canadian physicians showed that 98% had experienced minor aggression, 75% severe aggression, and 39% very severe aggression.[11]

In China, violence against physicians is a major problem.[12] We speculate that this violence is related to the healthcare organization system in China, but research on this subject is still ongoing.

A Japanese study found a relationship between patient-physician aggression and posttraumatic stress disorder, with a violence incidence of 0.20 x10-3 events per practice hour.[13]

In 2011, a cross-sectional study of aggression against Australian family physicians showed that, during the preceding 12 months, 58% had experienced verbal aggression, 18% material damage or theft, 6% physical aggression, 4% stalking, 6% sexual harassment, and 0.1% sexual violence.[14] Physicians with less professional experience were more likely to have experienced verbal aggression compared to their colleagues, and women were more likely to have experienced sexual harassment compared to men.

In 2005, a Dutch study reported sexual harassment during medical internship.[15] Another study reported that Dutch paediatricians with less professional experience were more likely to encounter patient-physician aggression.[16]

In 2015, a German study reported that 91% of family physicians had been victims of patient aggression during their careers, with 73% experiencing aggression during the preceding 12 months.[17] Serious aggression had been experienced by 23% of those physicians during their careers and 11% during the preceding 12 months. Most participants still felt safe at their practice site, but 66% of female and 34% of male respondents felt insecure on home visits.

Belgian aggression research

In 1998, researchers using a safety survey in Belgian hospitals showed that psychiatric departments had higher rates of patient-physician aggression.[18] Since starting their work in the psychiatric department, 38% of physicians had experienced theft, 13% physical aggression, and 70% verbal aggression. Although 86% of physicians surveyed reported that they did not feel unsafe at their hospital, female physicians did feel insecure in the evenings, and insecurity was more prevalent in hospitals where French was spoken compared to those where Dutch was spoken.

Since that study in 1998, several small surveys have been conducted, but none are representative of the Belgian population, and none have been published in scientific journals. Although there is sufficient evidence that physicians are at risk for patient aggression, little effort has been made to identify which physicians are at increased risk of aggression.

The aim of this study was to describe the characteristics of physicians who are at increased risk for patient aggression in Belgium. We investigated possible associations between specific types of aggression and physician characteristics, and whether aggression occurs more frequently in inpatient or outpatient settings.

METHODS

Questionnaire

An online questionnaire in Dutch and French was developed for this cross-sectional survey. The questionnaire was available from March 28, 2017 to April 25, 2017 on the LimeSurvey platform (Germany, Version 2.05+). Paper questionnaires were not provided. Participants had to read the online informed consent and agree to participate by clicking the corresponding key before they could participate in the study.

The questionnaire first asked participants which of the four major types of aggression (physical, verbal, sexual or psychologic) the physician had experienced during his or her

career and during the preceding 12 months. Questions about the preceding 12 months were more detailed than the career questions. These questions were based on the questionnaire used in the German study by Vorderwülbecke et al.[17] We added psychologic violence which was not include in the German questionnaire. We used just as in the German study the 12-month period for the detailed questions on the "most recent aggression" because the recall bias might be too important for a longer period. Experiences with aggression over the last 12 months were also questioned in a German survey called Arztemonitor 2018. With over 8000 answering physicians it is one of the biggest studies on this subject but unfortunately this study was not published internationally.[18]

Physicians were also asked about aggression subtypes and places where aggression had occurred. Next, personal and demographic data were collected for each participant. To preserve participant privacy, questions were limited to sex, year of birth, number of years of practice, main practice activity, and number of co-workers. Based on these data, it should be impossible to track down which physicians completed the survey.

Participants

In Belgium, all physicians are required to register with the National Medical Council. The council sent an email to the 36,335 active registered physicians with a link to the survey and a request to complete the questionnaire. An initial email was sent on March 28, 2017 and a reminder email was sent on April 13, 2017. Only active physicians who had worked in Belgium for the past 12 months were eligible to participate in the study. Physicians also had to have computer access, an email address, and needed to understand Dutch or French.

Patient and public involvement

Patients and the public were not involved in this study. Given the sensitive subject of patient-physician aggression, we chose not to include the patient's point of view in this study. In future smaller-scale research this could be done, for example, by means of personal

interviews sometime after the registration of the aggression. The input of the public and the patient could also be requested in the development and implementation of the study.

Difference between aggression and violence

The difference between aggression and violence is not always very clear. The terms aggression and violence are often used interchangeably, although the two are not synonymous. Both concepts are also subjective, with overlapping meanings that can be interpreted differently by different persons. Aggression is any behaviour that can potentially harm people or objects. This behaviour can occur at the physical or psychologic level. Aggression can manifest as abusive language, damage to objects, violent threats to others, or assaults on persons (including the aggressor himself or herself). Violence is physical assault with intent to harm. Not all aggression leads to violence; violence is a step further than aggression. Throughout this paper, we preferentially use the term aggression. We consider four major classes of aggression: physical, verbal, psychologic, and sexual.

Ethical review

The protocol and questionnaire were reviewed by the Medical Ethics Committee of the University Hospital Brussels and approved on March 8, 2017.

Statistical analysis

Statistical analysis was completed using LimeSurvey, Microsoft Excel 2016, and IBM SPSS Statistics 24. Partially completed or unsaved questionnaires were not included in the analysis.

For the statistical analysis, variables were considered as independent (ie, explanatory or input) or dependent (ie, outcome or target).

Descriptive statistics are presented as frequencies (n, %) for categorical variables and medians (and interquartile ranges [IRs]) for continuous outcomes. Univariate analysis was performed using Chi-square tests or Fisher's exact test where appropriate. For ordinal

variables, *P* values were calculated using the linear-by-linear association. The 95% confidence interval (CI) was calculated using the standard error (SE), as given by the formula SE = √ [p (1-p) / n]. For large cross-tables with expected values less than five, the Fisher's exact test was used for subgroups using the Monte Carlo method (95% CI and 10,000 samples).

A logistic regression model was developed using aggression during career, aggression during the preceding 12 months, physical aggression, verbal aggression, psychologic aggression, and sexual aggression as dependent variables. Age (five groups), sex, language, years of practice experience (five groups), medical department, and number of colleagues (three groups) were used as independent variables. A stepwise backward (conditional) logistic regression was performed for each of these independent variables. All tests were performed using an α of 0.05.

RESULTS

Participant demographics

The National Medical Council has a register with all Belgian physicians. All 36,333 physicians of the register received an email with an invitation to participate in the study. The 1,685 physicians who did not work in Belgium for the preceding 12 months received also an invitation to participate but they were excluded at the beginning of the questionnaire. The questionnaire was completed by 4,930 participants but 3,726 questionnaires were valid to take into account for statistics.

Most respondents were male (52%), and most completed the survey in Dutch (67%) (Table 1). Their median age was 42 years and the median number of years in medical practice was 13. Both continuous variables had non-normal distributions, with *P* values of less than .0001 for both the Kolmogorov-Smirnov and the Shapiro-Wilk tests. The participants were representative of the Belgian physicians with respect to age, gender and maternal language.

Forty-two percent of respondents worked in a hospital, whereas 22% had a solo outpatient practice, and 18% were part of a group practice. Participants from nearly all medical specialties participated in the study. The most represented hospital departments were anaesthesiology (10.6% [n = 164]), radiology (8.7% [n = 134]), paediatrics (6.6% [n = 102]), orthopaedics (6.2% [n = 96]), and the emergency department (5.8% [n = 89]).

Prevalence

Table 2 shows the reported prevalence and types of patient-physician aggression. Multiple answers were allowed for responses, as participants may have experienced multiple types of aggression in multiple practice locations. Eighty-four percent of participants had experienced aggression during their careers, with 37% having this experience during the preceding 12 months. Of those who encountered aggression during the past 12 months, 91% experienced it in a consultation room, 34% outside the consultation room, and 39% during emergency medical services in hospitals or in primary care.

Differences between sexes

More women than men encountered patient-physician aggression during their careers (87% versus 82%; $P < .0001$) and during the preceding 12 months (43% versus 31%; $P < .001$). During their careers, more men than women had experienced physical aggression (27% and 21%, respectively; $P < .001$), whereas more women than men had experienced psychologic aggression (35% and 49%, respectively; $P < .001$) and sexual aggression (4% and 17%, respectively; $P < .001$). There were no differences between men and women with respect to experience of verbal aggression during the careers.

Table 3 shows the proportion of participants who encountered patient-physician aggression during the preceding 12 months and the subtypes of aggression experienced by both men and women. During this period, women and men experienced similar rates of physical aggression, but verbal aggression was experienced by 38% of women compared to 28% of men ($P < .001$). Scolding and insulting were particularly common forms of verbal aggression

against women. Women also experienced more psychologic aggression compared to men (38% and 28%, respectively; $P < .001$). Almost all subtypes of psychologic aggression were more frequently experienced by women. Sexual aggression was experienced by 15% of female physicians compared to 5% of male physicians ($P < .001$). Of the sexual aggression subtypes, only sexual remark aggression occurred more commonly among women than men.

During the preceding 12 months, more women (40%) than men (28%) experienced aggression in their own consultation rooms ($P < .001$). Women also encountered more aggression compared to men during on-call duties (17% compared to 12%; $P < .001$).

Patient aggression by language spoken

Dutch-speaking (n = 2,477) and French-speaking (n = 1,249) physicians experienced similar rates of aggression during their careers (85% and 84% respectively; $P = .781$) and during the preceding 12 months (36% and 38%, respectively; $P = .561$). However, compared to those who spoke French, those who spoke Dutch experienced more verbal aggression (75% and 79%, respectively; $P = .004$) and sexual aggression (7% and 12%, respectively; $P < .001$) during their careers.

Table 4 shows the proportion of participants who experienced patient-physician aggression during the preceding 12 months and details the subtypes of aggression by language spoken. During the preceding 12 months, French-speaking physicians experienced more physical aggression than their Dutch-speaking colleagues. Those who spoke French more often reported severe physical violence (5% compared to 3%; $P = .006$) and damage or theft (9% compared to 7%; $P = .012$). Although the rate of verbal aggression did not differ between groups, physicians who spoke French experienced more threats of physical aggression (15% and 17%, respectively; $P = .022$). Although the rates of psychologic aggression did not differ, blaming and blackmailing were more commonly reported by the French-speaking participants ($P = .013$ and $P < .001$, respectively). Reports of sexual touching were more

common for French-speaking participants (*P* = .041), whereas reports of patient sexual acts were more common for Dutch-speaking participants (*P* = .006).

With respect to location, French-speaking physicians were more likely to encounter aggression outside of their consultation rooms compared to their Dutch-speaking colleagues (15% and 11%, respectively; *P* = .001).

Patient aggression by physician age

Younger physicians were more likely to experience patient-physician aggression during the preceding 12 months (Figure 1), with 46% of those born in 1980 or later experiencing aggression, compared to 15% of those born before 1950 (*P* for trend < .001). This trend of increasing aggression with decreasing age was observed for all types of aggression. For physical aggression, the rate increased from 11% among the oldest physicians to 18% among the youngest physicians (*P* for trend < .001). Verbal aggression increased from 13% to 43% (*P* for trend < .001), and psychologic aggression increased from 11% to 39% (*P* for trend < .001). Furthermore, sexual aggression increased from 4% to 14% (*P* for trend < .001).

During the preceding 12 months, a shorter length of professional practice was also associated with increasing rates of aggression (Figure 2).

Workplace and speciality

Physicians working in a solo practice (30%) encountered less aggression during the preceding 12 months compared to those working in a group practice (39%, *P* < .001), community health centre (52%, *P* < .001) or hospital (36%, *P* < .003). Workplaces with the highest risk for aggression during the preceding 12 months were psychiatric institutions (73%), centres for mental health (71%), health insurance companies (67%), and community health centres (52%).

The most dangerous work environments for aggression within hospitals were the emergency (82%), psychiatry (64%), neurology (58%), geriatrics (53%), and internal medicine (52%)

departments. All other departments were associated with aggression reports of less than 50% during the past 12 months.

During their careers, 83% of participants providing inpatient care experienced aggression, compared to 85% of those providing outpatient care (*P* = .046). Those working outside a hospital were more likely to experience psychologic and sexual aggression compared to those working inside a hospital (45% versus 37%, *P* < .001; and 12% versus 8%, *P* < .001). During the preceding 12 months, outpatient and inpatient physicians reported similar rates of patient aggression (Table 5). However, those working inside the hospital reported more physical aggression compared to those working in outpatient settings (17% and 13%, respectively; *P* = .002). Moderate and severe physical aggression occurred more common inside the hospital. Verbal aggression and its subtypes occurred more frequently in the hospital compared to the outpatient setting (36% versus 31%; *P* = .002). There was no difference in the rate of psychologic aggression between outpatient and inpatient settings; however, manipulation or incitement to illegal actions was more common in outpatient than inpatient settings (18% and 11%, respectively; *P* < .0001). Sexual aggression by patients toward physicians was also more common in outpatient (10%) compared to inpatient settings (8%; *P* = .03), especially for sexual acts by patients.

Practice structure was also associated with aggression. An increasing number of professional partners was associated increasing violence (*P* for trend < .001). All types of violence had a similar statistical trend (*P* < .001) except for sexual violence (*P* for trend = .015).

Logistic regression

In logistic aggression analysis, age or years of experience were correlated with aggression (Table 6). Each variable was related to a different form of aggression: younger age was related to physical aggression and increased aggression during the career, whereas fewer years of professional experience was related to other types of aggression.

Sex was a risk factor in five out of six logistics regression analyses, with females being more at risk for all types of aggression except physical aggression.

The number of professional colleagues was also positively associated with five out of six forms of aggression. Increasing numbers of professional partners was related to increasing risk for patient-physician aggression.

The inpatient setting was also related to most types of aggression, but it was not possible to determine from the logistic regression which departments were most at-risk because the variable was not ordinal. It was confirmed, however, that risk differs by hospital department.

DISCUSSION

Aggression during career

This research aimed to characterize the current state of patient aggression toward physicians in Belgium. During their careers, most physicians had experienced some type of aggression within the physician-patient relationship. Verbal aggression (77%) occurred most commonly, but psychologic (42%), physical (24%), and sexual (10%) forms of aggression were also important. The rates of verbal, psychologic, and physical aggression were similar to those reported previously for physicians in Belgium and other countries.[11 17 19 20 21 22] The reported rates of sexual aggression were significantly lower than those reported in previous Belgian and international studies, however.[10 21 22]

During their careers, women were slightly more likely than men to experience aggression. Men were more likely to experience physical aggression, whereas women were more likely to experience psychologic and sexual aggression. Our findings are consistent with previous Belgian surveys showing more frequent sexual aggression toward female physicians.[20 21 22] However, we found a much lower rate of sexual aggression against women physicians during their careers than previously reported in international studies. [20 21 22]

Overall, there were no differences in aggression based on spoken language, although sexual violence was more commonly experienced by Dutch-speaking physicians compared to their French-speaking colleagues (12% versus 7%).

Our finding that aggression occurred less commonly during physicians' careers in solo practice compared to community health centres and group practice differed from that of a previous Belgian survey.[22] One may hypothesize that a work setting with several colleagues may be protective against aggression; however, our findings do not support this hypothesis. Working with five or more colleagues appears to be an independent risk factor for aggression. Settings such as community health centres may attract more patients with problematic socio-economic backgrounds; thus, these patients may be more likely to express their demands or emotions with aggression. However, multivariate analysis did not show that physicians working in a community health centres are at increased risk for aggression, which seemed primarily related to number of colleagues, independent of practice type.

Psychiatric institutions were significantly more dangerous workplaces compared to general hospitals, where emergency departments were the most at-risk areas for experiencing aggression. Nearly all physician participants reported that they had experienced aggression during their careers. The finding of higher risk of aggression in psychiatry and emergency departments is consistent with previous studies.[7 19]

Physicians who practiced primarily in outpatient settings were more likely to encounter violence during their careers compared to those who practiced primarily in the hospital. More specifically, outpatient physicians were more likely to experience psychologic and sexual aggression.

Aggression during the preceding 12 months

The logistic regression showed that female sex, younger age or fewer years of experience, a higher number of colleagues, and hospital department were independent risk factors for aggression during the preceding 12 months.

Our study also aimed to describe the various subtypes of aggression encountered by physicians during the 12 months preceding survey administration. Our study showed that 37% of physicians had experienced patient aggression (verbal, 33%; psychologic, 30%; physical, 14%; and sexual, 10%) during the preceding 12 months. These rates were lower than those reported for studies in other countries.[14 17]

The finding that most physicians experienced aggression within their consultation room may be explained by the fact that physicians surveyed spent most of their professional time in their outpatient practice settings. In that setting, more than one type of aggression was frequently reported. Psychologic and verbal aggression often co-occurred.

During the preceding 12 months, women were more likely than men to experience aggression (43% versus 31%). Consistent with a previous report, women were more likely to experience verbal (38% versus 28%), psychologic (36% versus 24%), and sexual (15% versus 5%) aggression compared to men.[14] Women were also more likely to experience aggression in their own practices (40% versus 28%) and during on-call duties (17% versus 12%).

Native language was not associated with most measures of patient-physician aggression, although French-speaking physicians more often experienced severe physical aggression (5% versus 3%) and blackmailing (13% versus 6%).

From the logistic regression speaking French was associated with aggression during the past twelve month and more in particular with physical and psychological aggression.

Our finding that all forms of aggression were experienced more commonly by younger physicians and by those with little practical experience is consistent with results from published international studies.[14 16]

Physicians in solo practice reported less aggression during the preceding 12 months compared to those in group practice and community health centres. Those working in psychiatric institutions had the highest risk for patient aggression among outpatient physicians. In hospitals, the emergency department was the most likely site of aggression.

Overall, there were no differences in reported aggression during the preceding 12 months for

inpatient and outpatient settings. Physical aggression (especially mild and severe physical aggression) and verbal aggression occurred more frequently among physicians whose primary practice was in the hospital. In contrast, sexual aggression was experienced more commonly by physicians who practiced in outpatient settings. The finding that those who practice in outpatient settings experience more aggression may relate to their role as family physicians who make more frequent home calls compared to specialists.

Recommendations for prevention

Preventive action should be focused initially on high-risk groups: young female physicians who work in psychiatric facilities, emergency departments, and community health centres. Campaigns should focus not only on sexual aggression, but other forms of aggression that are frequently encountered by female physicians.

Demographic changes in the physician population should also be considered. As the percentage of female physicians increases, preventive measures should focus on female physicians to reverse the trend of increasing patient-physician aggression.[17 23] Preventive action should not only focus on high risk groups. Almost one third of the male physicians experienced aggression too. Awareness and de-escalation technics should be trained by all students and young physicians. By optimizing the setting of the daily patient-physician contacts reasons for aggressive behavior can be reduced.

The high rate of patient-physician aggression found in our study differs greatly from the actual number of cases of aggression that are officially reported. To the best of our knowledge, less than 100 cases of patient-physician aggression are reported each year to the National Medical Council. This serious under-reporting needs to be addressed. Physicians should be encouraged to report every case of aggression to the police, the national call point of the National Medical Council, and possibly to an internal local call point. Reporting should be promoted, among other means, by a national awareness campaign.

Strengths and limitations

This study enrolled many Belgian physicians from a diverse geographical area and all medical specialties. Despite the low response rate of 10.25% (3,726 of 36,335 invited physicians participated), the present study is the largest ever to address this topic, with twice as many participants as the next largest similar peer-reviewed and published study in other countries.[17 24] However, there is a risk of recall- and response bias because the participants might be more motivated to participate if they were ever confronted with aggression. For this reason, the figures regarding the prevalence must be interpreted with caution. But our study population was sufficiently large to demonstrate statistical differences, even among smaller subgroups with regard to the characteristics of physicians at risk for aggression.

Because no paper questionnaires were used, only physicians with internet access could complete the survey. However, no bias is expected from this limitation, as most Belgian physicians use a computer as part of their medical practice. We do not have official figures on the use of computers by Belgian physicians. From the figures of Statbel, the Belgian statistical office, we know that 94% of all Belgians with a high education use the internet daily and 6% at least once weekly.[25]

A second limitation is the demographic data collected for study participants. To ensure privacy, we only collected information that could not be used to identify specific physicians. Consequently, physician specialty and geographic location of their practice or hospital were not collected. In this study, only the main activity and the location of the aggression were collected, per the regulations of the medical ethics committee. Thus, a direct comparison between family physicians and specialists was not possible. Instead, physicians working in hospitals (primarily specialists) were compared to those working in outpatient settings (primarily family physicians).

This paper focusses on the physicians' characteristics related to aggression. Some patient-related factors as there are unmet patient needs, alcohol- or drug abuse or mental illness are reported in another paper focusing on the patient characteristics. In future research attention should be paid on other causes of aggression against physicians such as crowding in

emergency departments, long waiting hours or stressed, overworked and unprepared medical staff.

Lastly, classifications of aggression and violence are subjective and susceptible to varying interpretations. Participants may have differing views of what behaviours constitute aggression. Efforts were made to minimize subjectivity in this area by providing survey participants with explanations of aggression classifications and subtypes.

The fact to consider an event as aggression will depend on several characteristics of the situation and the victim. A Flemish study investigated the relationship between the physicians personality (based on the 'Big Five' personality traits) and the reporting of aggression. Physicians with 'reserved' and 'careless' personality types were more likely to report aggression. Physicians with 'innovative', 'challenging', or 'confident' personality types were also at increased risk, but to a lesser extent.[26]

Some other indicators related to aggression were not includes in our study. A relevant study identified the perceptions of staff and patients regarding the factors that lead to violence against nurses and physicians. Both for staff and patients, conditions such as overload, pressure, fatigue, and frustration may lead to violence.[27]

Future research

There are still no exact figures about the incidence and trends of aggression against Belgian physicians and other medical professionals such as nurses or paramedics. Prospective cohort studies with representative study populations would be needed to further study this question. Preventive measures could then by designed and evaluated for effectiveness using prospective interventional research.

CONCLUSIONS

More than 80% of Belgian physicians report experiencing patient aggression during his or her career. Female physicians and those who are younger or less experienced are more likely to experience aggression during their careers. During the preceding 12 months, one in

three Belgian physicians experienced aggression within the physician-patient relationship. Verbal aggression was reported most often, followed by psychologic, physical, and sexual aggression. Female and young physicians were more likely to experience aggression during the preceding 12 months compared to male and older physicians. Psychiatric institutions and emergency departments were the practice sites where physicians were most likely to encounter aggression.

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Table 1. Participant demographics (n = 3,726)

Characteristic	% (n)
Gender	
Men	51,8% (1,930)
Women	48,2% (1,796)
Maternal language	
Dutch	66,5% (2,477)
French	33,5% (1,249)
Median age in years (IQR)	42 (22)
Median medical activity in years (IQR)	13 (21)
Type of medical activity	
Solo practice	22,1% (822)
Duo practice	7,8% (290)
Group practice	17,5% (653)
Community Health Centre	2,1% (79)
Hospital	41,5% (1,545)
Psychiatric institution	2,5% (94)
Homes for the elderly	0,5% (19)
Health insurance company	1,0% (39)
Company control doctor	0,5% (20)
Community childcare centre	0,1% (4)
Prison	0,1% (5)
Occupational medicine	0,8% (28)
Community centre for mental health	0,4% (14)
School doctor	0,3% (10)
Medical expertise	0,2% (7)
Others	2,6% (97)
Number of collaborators in the practice	
0	27,9% (1,039)
1-5	36,2% (1,348)
≥5	35,9% (1,339)

Table 2. Prevalence and types of patient-physician aggression (N = 3,726)

Type of aggression	During career % (n)	During past 12 months %(n)
Total	84,4% (3,144)	36,8% (1,372)
Physical	24,2% (903)	14,4% (538)
Verbal	77,2% (2,877)	33,1% (1,235)
Psychic	41,7% (1,552)	30,0% (1,116)
Sexual	10,1% (378)	9,5% (353)
Other	1,5% (55)	1,4% (51)
None	15,6% (582)	63,2% (2,354)

Table 3. Types of patient aggression experienced by physicians during the preceding 12 months (N = 3,726)

Type of aggression	Men (*n*=1930)	Women (*n*=1796)	*p*-value
Total	30,9%	43,2%	<0,0001
Physical aggression	13,7%	15,3%	0,17
Mild physical aggression (such as pushing, gripping, spitting)	10,2%	10,3%	0,93
Heavy physical aggression (such as biting, kicking, hitting, strangulation)	4,1%	3,4%	0,27
Attack with object, weapon and / or animal	1,5%	2,1%	0,16
Damage to property and / or theft	6,6%	7,9%	0,15
Verbal aggression	28,3%	38,4%	<0,001
Threat with physical aggression	15,4%	15,5%	0,97
Scold and / or insult	27,0%	36,9%	<0,0001
Psychological aggression	24,1%	36,2%	<0,0001
Humiliation	7,6%	14,0%	<0,0001
Blaming and / or intentional guilt delivery	18,9%	31,2%	<0,0001
Threat with suicide and / or automutilation	10,0%	15,2%	<0,0001
Manipulation and / or incitement to illegal things	13,0%	17,0%	0,001
Chantage	6,9%	10,5%	<0,0001
Load and / or reproach	11,2%	10,4%	0,42
Sexual aggression	4,7%	14,6%	<0,0001
Sexual remarks	2,8%	13,0%	<0,0001
Sexual acts by themselves	0,2%	2,0%	<0,0001
Hold on	1,9%	2,9%	0,039
Sexual touch	0,6%	1,3%	0,023
Rape	0,1%	0,1%	1,00[a]
Stalking	1,9%	2,4%	0,27
Others	1,2%	1,6%	0,34
None	69,1%	56,8%	<0,0001

[a] Calculated using two-sided Fisher's exact test

Table 4. Types of aggression experienced by Dutch-speaking and French-speaking physicians during the preceding 12 months (N = 3,726)

Type of aggression	Dutch-speaking (*n*=2477)	French-speaking (*n*=1249)	*p*-value
Total	36,5%	37,5%	0,56
Physical aggression	13,9%	15,5%	0,21
Mild physical aggression (such as pushing, gripping, spitting)	9,9%	11,0%	0,31
Heavy physical aggression (such as biting, kicking, hitting, strangulation)	3,1%	5,0%	0,006
Attack with object, weapon and / or animal	1,5%	2,3%	0,06
Damage to property and / or theft	6,5%	8,7%	0,012
Verbal aggression	33,3%	32,9%	0,83
Threat with physical aggression	14,5%	17,4%	0,022
Scold and / or insult	31,9%	31,5%	0,83
Psychological aggression	29,5%	30,8%	0,41
Humiliation	11,0%	10,0%	0,36
Blaming and / or intentional guilt delivery	23,6%	27,3%	0,013
Threat with suicide and / or automutilation	12,9%	11,8%	0,33
Manipulation and / or incitement to illegal things	15,4%	13,9%	0,23
Chantage	6,4%	13,1%	<0,0001
Load and / or reproach	10,7%	11,0%	0,77
Sexual aggression	9,9%	8,7%	0,27
Sexual remarks	8,0%	7,3%	0,47
Sexual acts by themselves	1,4%	0,4%	0,006
Hold on	2,5%	2,2%	0,57
Sexual touch	0,7%	1,4%	0,041
Rape	0,1%	0,1%	1,00[a]
Stalking	2,0%	2,5%	0,36
Others	0,9%	2,2%	0,001
None	63,5%	62,5%	0,56

[a] Calculated using two-sided Fisher's exact test

Table 5. Types of patient aggression experienced by physicians providing inpatient and outpatient care during the preceding 12 months (N = 3,726)

Type of aggression	Inside hospital (*n*=1639)	Outside hospital (*n*=2087)	*p*-value
Total	38,3%	35,7%	0,11
Physical aggression	16,5%	12,8%	0,002
Mild physical aggression (such as pushing, gripping, spitting)	14,0%	7,3%	<0,0001
Heavy physical aggression (such as biting, kicking, hitting, strangulation)	6,0%	2,0%	<0,0001
Attack with object, weapon and / or animal	1,6%	1,8%	0,69
Damage to property and / or theft	6,7%	7,7%	0,23
Verbal aggression	35,8%	31,0%	0,002
Threat with physical aggression	19,5%	12,3%	<0,0001
Scold and / or insult	34,5%	29,6%	0,001
Psychological aggression	30,1%	29,9%	0,88
Humiliation	10,9%	10,4%	0,64
Blaming and / or intentional guilt delivery	25,6%	24,2%	0,32
Threat with suicide and / or automutilation	13,3%	11,9%	0,19
Manipulation and / or incitement to illegal things	11,4%	17,7%	<0,0001
Chantage	8,7%	8,6%	0,87
Load and / or reproach	11,8%	10,1%	0,11
Sexual aggression	8,3%	10,4%	0,030
Sexual remarks	7,1%	8,3%	0,17
Sexual acts by themselves	0,6%	1,4%	0,020
Hold on	2,3%	2,4%	0,71
Sexual touch	0,6%	1,1%	0,09
Rape	0,0%	0,2%	0,14[a]
Stalking	1,9%	2,4%	0,30
Others	0,9%	1,7%	0,035
None	61,7%	64,3%	0,11

[a] Calculated using two-sided Fisher's exact test

Table 6. Logistic regression for aggression type

Variables	Sig.	OR	95% CI for OR
Aggression during the career			
Gender	0.007	0.679	0.512 – 0.901
Age	0.008	1.168	1.041 – 1.311
Number of collaborators	0.024	1.212	1.025 – 1.432
Aggression during the past 12 months			
Language	0.016	1.326	1.054 – 1.669
Gender	0.001	0.695	0.556 – 0.868
Years of experience	<0.001	0.775	0.702 – 0.855
Hospital department	0.001	1.012	1.005 – 1.019
Number of collaborators	0.003	1.250	1.081 – 1.446
Physical aggression during past 12 months			
Language	0.005	1.535	1.136 – 2.075
Age	<0.001	1.291	1.128 – 1.478
Hospital department	<0.001	1.020	1.010 – 1.030
Number of collaborators	0.004	1.350	1.099 – 1.659
Verbal aggression during past 12 months			
Gender	0.010	0.744	0.594 – 0.933
Years of experience	<0.001	0.781	0.706 – 0.863
Hospital department	0.001	1.012	1.005 – 1.020
Number of collaborators	0.011	1.211	1.045 – 1.404
Psychological aggression during past 12 months			
Language	<0.001	1.595	1.249 – 2.035
Gender	<0.001	0.647	0.509 – 0.822
Years of experience	<0.001	0.785	0.705 – 0.874
Hospital department	<0.001	1.014	1.006 – 1.022
Number of collaborators	0.001	1.311	1.119 – 1.535
Sexual aggression during past 12 months			
Gender	0.001	0.472	0.307 – 0.725
Years of experience	0.004	0.737	0.600 – 0.906
Hospital department	0.002	1.022	1.008 – 1.038

FIGURE LEGENDS

Figure 1. Patient aggression experienced by physicians during the preceding 12 months, by year of physician birth

Figure 2. Patient aggression experienced by physicians during the preceding 12 months, by number of years in practice

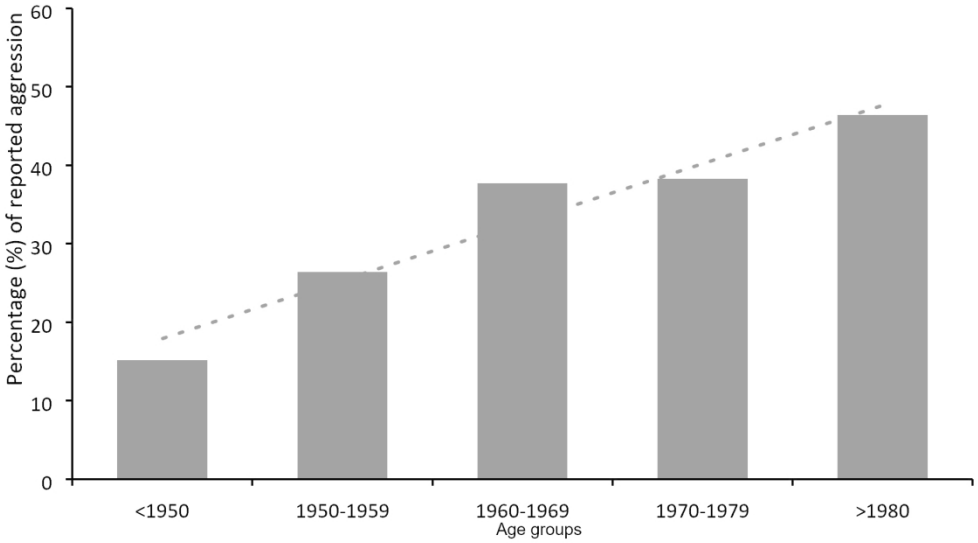

Figure 1. Patient aggression experienced by physicians during the preceding 12 months, by year of physician birth

169x97mm (300 x 300 DPI)

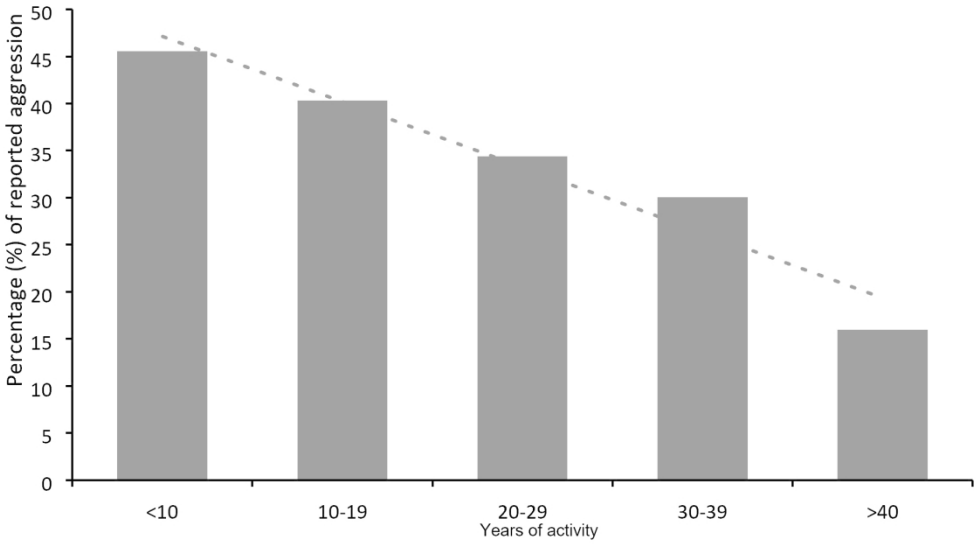

Figure 2. Patient aggression experienced by physicians during the preceding 12 months, by number of years in practice

169x97mm (300 x 300 DPI)

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	4
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	6-8
Objectives	3	State specific objectives, including any prespecified hypotheses	8
Methods			
Study design	4	Present key elements of study design early in the paper	9-10
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	8-10
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	9-10
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	8-9
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	8-10
Bias	9	Describe any efforts to address potential sources of bias	9
Study size	10	Explain how the study size was arrived at	9
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	10-11
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	10-11
		(*b*) Describe any methods used to examine subgroups and interactions	10-11
		(*c*) Explain how missing data were addressed	10-11
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	10-11
		(*e*) Describe any sensitivity analyses	10-11
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	11
		(b) Give reasons for non-participation at each stage	11
		(c) Consider use of a flow diagram	11
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	11-12 Tabl 1
		(b) Indicate number of participants with missing data for each variable of interest	11
Outcome data	15*	Report numbers of outcome events or summary measures	11-16
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear	11-16

		which confounders were adjusted for and why they were included	
		(*b*) Report category boundaries when continuous variables were categorized	11-16
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	11-16
Discussion			
Key results	18	Summarise key results with reference to study objectives	16-17
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	20-21
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	21-22
Generalisability	21	Discuss the generalisability (external validity) of the study results	19
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	NA

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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A cross-sectional study on patient-physician aggression in Belgium: physician characteristics and aggression types

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A cross-sectional study on patient-physician aggression in Belgium: physician characteristics and aggression types

Running title: Patient-physician aggression

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Declaration of interests

All authors declare no support from any organisation for the submitted work, no financial relationships with any organisations that might have an interest in the submitted work in the previous three years, no other relationships or activities that could appear to have influenced the submitted work.

Transparency declaration

The lead author (the manuscript's guarantor) affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned have been explained.

Ethics committee approval

A statement is included in the manuscript, including the name of the committee granting approval.

Clinical trial registration

This study is a cross-sectional survey and no intervention was planned or done. For these reasons the study was not registered as a clinical trial.

Role of the funding source

The study was unfunded.

Data sharing statement

Additional unpublished data from the study are available to all authors. They will be used to write two more papers on the characteristics of the patient/aggressor and on the preventive measure against patient-physician aggression.

The contributions of the different authors to this manuscript are as follows: -

1. Lennart De Jager: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
2. Michel Deneyer: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
3. Ronald Buyl: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
4. Sophie Roelandt: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
5. Ralph Pacqueu: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
6. Dirk Devroey: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted

ABSTRACT

Objectives: The aim of this Belgian research study was to describe the characteristics of physicians who are at increased risk for patient-physician aggression. Secondly, aggression subtypes were described and data were provided on the prevalence of patient-physician aggression in Belgium.

Design: Cross-sectional survey

Setting: Primary and secondary care in- and outside hospitals

Participants: Any physician who had worked in Belgium for the preceding 12 months was eligible to participate (N=34,648).

Main Outcome Measures: An online, original questionnaire was used to obtain physician characteristics (e.g. age, sex, native language), department, working conditions and contact with aggressive patients during their career and during the preceding 12 months.

Results: The questionnaire was completed by 4,930 participants and 3,726 (76%) were valid to take into account for statistics. During the preceding 12 months, 37% had been victims of aggression: 33% experienced verbal aggression, 30% psychologic, 14% physical, and 10% sexual. Multiple answers were allowed. Women and younger physicians were more likely to experience aggression. Psychiatric departments and emergency departments were the settings most commonly associated with aggression. Physicians who provided primarily outpatient care were more subject to aggression.

Conclusion: Belgian physicians experience several forms of aggression. Those most at-risk of aggression are young and female physicians who work in outpatient, emergency, or psychiatric settings.

Keywords: violence, aggression, patient-physician relationship

Strengths and limitations of this study

1. This study is one of the largest ever to address the topic of patient-physician aggression.
2. Only physicians with internet access could complete the survey but most Belgian physicians use a computer as part of their medical practice.
3. To ensure privacy, physician specialty and geographic location of their practice or hospital were not collected.
4. Classifications of aggression and violence are subjective and susceptible to varying interpretations.

INTRODUCTION

On December 1, 2015, 64-year-old family physician Patrik Roelandt was murdered during a house call to a patient. The murderer was known to the police and had a past criminal record, of which his physician was unaware. He is only one of many physicians who have experienced patient-physician aggression and violence. The physician-patient relationship is complex and based on mutual trust, with physicians serving as helpers and patients as care-seekers. There is often a very small difference between patient assertiveness and aggression in the physician-patient relationship.

International aggression research

In 2000, the World Health Organization, in collaboration with the International Labour Office, the International Council of Nurses, and Public Services International, investigated workplace violence in the healthcare sector.[1] For that study, a research tool was designed to assess workplace violence experienced by physicians and other healthcare workers.[2] Di Martino used this same tool in 2002 to synthesize the results of rural studies of violence against healthcare workers in several countries.[3] One of his conclusions was that more attention was needed to address aggression in nearly all countries studied. Furthermore, a report with preventive guidelines was prepared based on the results of these studies.[4]

In 2014, the International Society of Orthopaedic Surgery and Traumatology (SICOT) statement in Hyderabad, India called on governments to provide better registration systems, awareness of aggressive populations, stricter penalties, and protections for healthcare workers.[5 6]

In 2016, a review was published about the current state of aggression against healthcare workers in the US.[7] Little was known at that time about aggression in primary care settings; emergency and psychiatric departments had been the most well-studied environments, and were thought to be the most dangerous. Physicians and other healthcare professionals were at risk, however. The authors suggested that stricter penalties be placed for perpetrators of violence against healthcare workers and that easy procedures should be implemented to

report incidents. After that report, several investigations were conducted to assess aggression in emergency departments in the US. About three-fourths of physicians in emergency departments reported experiencing some form of violence, and one-fourth of staff members felt unsafe.[8 9]

A large US study showed that 48% of female physicians experienced sex-based intimidation, and 37% had experienced sexual harassment during their careers.[10]

A large cross-sectional study of Canadian physicians showed that 98% had experienced minor aggression, 75% severe aggression, and 39% very severe aggression.[11]

In China, violence against physicians is a major problem.[12] We speculate that this violence is related to the healthcare organization system in China, but research on this subject is still ongoing.

A Japanese study found a relationship between patient-physician aggression and posttraumatic stress disorder, with a violence incidence of 0.20 x10-3 events per practice hour.[13]

In 2011, a cross-sectional study of aggression against Australian family physicians showed that, during the preceding 12 months, 58% had experienced verbal aggression, 18% material damage or theft, 6% physical aggression, 4% stalking, 6% sexual harassment, and 0.1% sexual violence.[14] Physicians with less professional experience were more likely to have experienced verbal aggression compared to their colleagues, and women were more likely to have experienced sexual harassment compared to men.

In 2005, a Dutch study reported sexual harassment during medical internship.[15] Another study reported that Dutch paediatricians with less professional experience were more likely to encounter patient-physician aggression.[16]

In 2015, a German study reported that 91% of family physicians had been victims of patient aggression during their careers, with 73% experiencing aggression during the preceding 12 months.[17] Serious aggression had been experienced by 23% of those physicians during their careers and 11% during the preceding 12 months. Most participants still felt safe at their practice site, but 66% of female and 34% of male respondents felt insecure on home visits.

Belgian aggression research

In 1998, researchers using a safety survey in Belgian hospitals showed that psychiatric departments had higher rates of patient-physician aggression.[18] Since starting their work in the psychiatric department, 38% of physicians had experienced theft, 13% physical aggression, and 70% verbal aggression. Although 86% of physicians surveyed reported that they did not feel unsafe at their hospital, female physicians did feel insecure in the evenings, and insecurity was more prevalent in hospitals where French was spoken compared to those where Dutch was spoken.

Since that study in 1998, several small surveys have been conducted, but none are representative of the Belgian population, and none have been published in scientific journals. Although there is sufficient evidence that physicians are at risk for patient aggression, little effort has been made to identify which physicians are at increased risk of aggression.

The aim of this study was to describe the characteristics of physicians who are at increased risk for patient aggression in Belgium. We investigated possible associations between specific types of aggression and physician characteristics, and whether aggression occurs more frequently in inpatient or outpatient settings.

METHODS

Questionnaire

An online questionnaire in Dutch and French was developed for this cross-sectional survey. The questionnaire was available from March 28, 2017 to April 25, 2017 on the LimeSurvey platform (Germany, Version 2.05+). Paper questionnaires were not provided. Participants had to read the online informed consent and agree to participate by clicking the corresponding key before they could participate in the study.

The questionnaire first asked participants which of the four major types of aggression (physical, verbal, sexual or psychologic) the physician had experienced during his or her

career and during the preceding 12 months. Questions about the preceding 12 months were more detailed than the career questions. These questions were based on the questionnaire used in the German study by Vorderwülbecke et al.[17] We added psychologic violence which was not include in the German questionnaire. We used just as in the German study the 12-month period for the detailed questions on the "most recent aggression" because the recall bias might be too important for a longer period. Experiences with aggression over the last 12 months were also questioned in a German survey called Arztemonitor 2018. With over 8000 answering physicians it is one of the biggest studies on this subject but unfortunately this study was not published internationally.[18]

Physicians were also asked about aggression subtypes and places where aggression had occurred. Next, personal and demographic data were collected for each participant. To preserve participant privacy, questions were limited to sex, year of birth, number of years of practice, main practice activity, and number of co-workers. Based on these data, it should be impossible to track down which physicians completed the survey.

Participants

In Belgium, all physicians are required to register with the National Medical Council. The council sent an email to the 36,335 active registered physicians with a link to the survey and a request to complete the questionnaire. An initial email was sent on March 28, 2017 and a reminder email was sent on April 13, 2017. Only active physicians who had worked in Belgium for the past 12 months were eligible to participate in the study. Physicians also had to have computer access, an email address, and needed to understand Dutch or French.

Patient and public involvement

Patients and the public were not involved in this study. Given the sensitive subject of patient-physician aggression, we chose not to include the patient's point of view in this study. In future smaller-scale research this could be done, for example, by means of personal

interviews sometime after the registration of the aggression. The input of the public and the patient could also be requested in the development and implementation of the study.

Difference between aggression and violence

The difference between aggression and violence is not always very clear. The terms aggression and violence are often used interchangeably, although the two are not synonymous. Both concepts are also subjective, with overlapping meanings that can be interpreted differently by different persons. Aggression is any behaviour that can potentially harm people or objects. This behaviour can occur at the physical or psychologic level. Aggression can manifest as abusive language, damage to objects, violent threats to others, or assaults on persons (including the aggressor himself or herself). Violence is physical assault with intent to harm. Not all aggression leads to violence; violence is a step further than aggression. Throughout this paper, we preferentially use the term aggression. We consider four major classes of aggression: physical, verbal, psychologic, and sexual.

Ethical review

The protocol and questionnaire were reviewed by the Medical Ethics Committee of the University Hospital Brussels and approved on March 8, 2017.

Statistical analysis

Statistical analysis was completed using LimeSurvey, Microsoft Excel 2016, and IBM SPSS Statistics 24. Partially completed or unsaved questionnaires were not included in the analysis.

For the statistical analysis, variables were considered as independent (ie, explanatory or input) or dependent (ie, outcome or target).

Descriptive statistics are presented as frequencies (n, %) for categorical variables and medians (and interquartile ranges [IRs]) for continuous outcomes. Univariate analysis was performed using Chi-square tests or Fisher's exact test where appropriate. For ordinal

variables, *P* values were calculated using the linear-by-linear association. The 95% confidence interval (CI) was calculated using the standard error (SE), as given by the formula SE = √ [p (1-p) / n]. For large cross-tables with expected values less than five, the Fisher's exact test was used for subgroups using the Monte Carlo method (95% CI and 10,000 samples).

A logistic regression model was developed using aggression during career, aggression during the preceding 12 months, physical aggression, verbal aggression, psychologic aggression, and sexual aggression as dependent variables. Age (five groups), sex, language, years of practice experience (five groups), medical department, and number of colleagues (three groups) were used as independent variables. A stepwise backward (conditional) logistic regression was performed for each of these independent variables. All tests were performed using an α of 0.05.

RESULTS

Participant demographics

The National Medical Council has a register with all Belgian physicians. All 36,333 physicians of the register received an email with an invitation to participate in the study. The 1,685 physicians who did not work in Belgium for the preceding 12 months received also an invitation to participate but they were excluded at the beginning of the questionnaire. The questionnaire was completed by 4,930 participants and 3,726 questionnaires were valid to take into account for statistics.

Most respondents were male (52%), and most completed the survey in Dutch (67%) (Table 1). Their median age was 42 years and the median number of years in medical practice was 13. Both continuous variables had non-normal distributions, with *P* values of less than .0001 for both the Kolmogorov-Smirnov and the Shapiro-Wilk tests. The participants were representative of the Belgian physicians with respect to age, gender and maternal language.

Forty-two percent of respondents worked in a hospital, whereas 22% had a solo outpatient practice, and 18% were part of a group practice. Participants from nearly all hospital departments participated in the study. The most represented departments were anaesthesiology (10.6% [n = 164]), radiology (8.7% [n = 134]), paediatrics (6.6% [n = 102]), orthopaedics (6.2% [n = 96]), and the emergency department (5.8% [n = 89]).

Prevalence

Table 2 shows the reported prevalence and types of patient-physician aggression. Multiple answers were allowed for responses, as participants may have experienced multiple types of aggression in multiple practice locations. Eighty-four percent of participants had experienced aggression during their careers, with 37% having this experience during the preceding 12 months. Of those who encountered aggression during the past 12 months, 91% experienced it in a consultation room, 34% outside the consultation room, and 39% during emergency medical services in hospitals or in primary care.

Differences between sexes

More women than men encountered patient-physician aggression during their careers (87% versus 82%; $P < .0001$) and during the preceding 12 months (43% versus 31%; $P < .001$). During their careers, more men than women had experienced physical aggression (27% and 21%, respectively; $P < .001$), whereas more women than men had experienced psychologic aggression (35% and 49%, respectively; $P < .001$) and sexual aggression (4% and 17%, respectively; $P < .001$). There were no differences between men and women with respect to experience of verbal aggression during the careers.

Table 3 shows the proportion of participants who encountered patient-physician aggression during the preceding 12 months and the subtypes of aggression experienced by both men and women. During this period, women and men experienced similar rates of physical aggression, but verbal aggression was experienced by 38% of women compared to 28% of men ($P < .001$). Scolding and insulting were particularly common forms of verbal aggression

against women. Women also experienced more psychologic aggression compared to men (38% and 28%, respectively; $P < .001$). Almost all subtypes of psychologic aggression were more frequently experienced by women. Sexual aggression was experienced by 15% of female physicians compared to 5% of male physicians ($P < .001$). Of the sexual aggression subtypes, sexual remark aggression and sexual acts by patients on themselves occurred more commonly among women than men.

During the preceding 12 months, more women (40%) than men (28%) experienced aggression in their own consultation rooms ($P < .001$). Women also encountered more aggression compared to men during on-call duties (17% compared to 12%; $P < .001$).

Patient aggression by language spoken

Dutch-speaking (n = 2,477) and French-speaking (n = 1,249) physicians experienced similar rates of aggression during their careers (85% and 84% respectively; $P = .781$) and during the preceding 12 months (36% and 38%, respectively; $P = .561$). However, compared to those who spoke French, those who spoke Dutch experienced more verbal aggression (75% and 79%, respectively; $P = .004$) and sexual aggression (7% and 12%, respectively; $P < .001$) during their careers.

Table 4 shows the proportion of participants who experienced patient-physician aggression during the preceding 12 months and details the subtypes of aggression by language spoken. During the preceding 12 months, French-speaking physicians experienced more physical aggression than their Dutch-speaking colleagues. Those who spoke French more often reported severe physical violence (5% compared to 3%; $P = .006$) and damage or theft (9% compared to 7%; $P = .012$). Although the rate of verbal aggression did not differ between groups, physicians who spoke French experienced more threats of physical aggression (15% and 17%, respectively; $P = .022$). Although the rates of psychologic aggression did not differ, blaming and blackmailing were more commonly reported by the French-speaking participants ($P = .013$ and $P < .001$, respectively). Reports of sexual touching were more

common for French-speaking participants (*P* = .041), whereas reports of patient sexual acts were more common for Dutch-speaking participants (*P* = .006).

With respect to location, French-speaking physicians were more likely to encounter aggression outside of their consultation rooms compared to their Dutch-speaking colleagues (15% and 11%, respectively; *P* = .001).

Patient aggression by physician age

Younger physicians were more likely to experience patient-physician aggression during the preceding 12 months (Figure 1), with 46% of those born in 1980 or later experiencing aggression, compared to 15% of those born before 1950 (*P* for trend < .001). This trend of increasing aggression with decreasing age was observed for all types of aggression. For physical aggression, the rate increased from 11% among the oldest physicians to 18% among the youngest physicians (*P* for trend < .001). Verbal aggression increased from 13% to 43% (*P* for trend < .001), and psychologic aggression increased from 11% to 39% (*P* for trend < .001). Furthermore, sexual aggression increased from 4% to 14% (*P* for trend < .001).

During the preceding 12 months, a shorter length of professional practice was also associated with increasing rates of aggression (Figure 2).

Workplace and department

Physicians working in a solo practice (30%) encountered less aggression during the preceding 12 months compared to those working in a group practice (39%, *P* < .001), community health centre (52%, *P* < .001) or hospital (36%, *P* < .003). Workplaces with the highest risk for aggression during the preceding 12 months were psychiatric institutions (73%), centres for mental health (71%), health insurance companies (67%), and community health centres (52%).

The most dangerous work environments for aggression within hospitals were the emergency (82%), psychiatry (64%), neurology (58%), geriatrics (53%), and internal medicine (52%)

departments. All other departments were associated with aggression reports of less than 50% during the past 12 months.

During their careers, 83% of participants providing inpatient care experienced aggression, compared to 85% of those providing outpatient care (*P* = .046). Those working outside a hospital were more likely to experience psychologic and sexual aggression compared to those working inside a hospital (45% versus 37%, *P* < .001; and 12% versus 8%, *P* < .001). During the preceding 12 months, outpatient and inpatient physicians reported similar rates of patient aggression (Table 5). However, those working inside the hospital reported more physical aggression compared to those working in outpatient settings (17% and 13%, respectively; *P* = .002). Moderate and severe physical aggression occurred more common inside the hospital. Verbal aggression and its subtypes occurred more frequently in the hospital compared to the outpatient setting (36% versus 31%; *P* = .002). There was no difference in the rate of psychologic aggression between outpatient and inpatient settings; however, manipulation or incitement to illegal actions was more common in outpatient than inpatient settings (18% and 11%, respectively; *P* < .0001). Sexual aggression by patients toward physicians was also more common in outpatient (10%) compared to inpatient settings (8%; *P* = .03), especially for sexual acts by patients.

Practice structure was also associated with aggression. An increasing number of professional partners was associated increasing violence (*P* for trend < .001). All types of violence had a similar statistical trend (*P* < .001) except for sexual violence (*P* for trend = .015).

Logistic regression

In logistic aggression analysis, age or years of experience were correlated with aggression (Table 6). Each variable was related to a different form of aggression: younger age was related to physical aggression and increased aggression during the career, whereas fewer years of professional experience was related to other types of aggression.

Sex was a risk factor in five out of six logistics regression analyses, with females being more at risk for all types of aggression except physical aggression.

The number of professional colleagues was also positively associated with five out of six forms of aggression. Increasing numbers of professional partners was related to increasing risk for patient-physician aggression.

The inpatient setting was also related to most types of aggression, but it was not possible to determine from the logistic regression which departments were most at-risk because the variable was not ordinal. It was confirmed, however, that risk differs by hospital department.

DISCUSSION

Aggression during career

This research aimed to characterize the current state of patient aggression toward physicians in Belgium. During their careers, most physicians had experienced some type of aggression within the physician-patient relationship. Verbal aggression (77%) occurred most commonly, but psychologic (42%), physical (24%), and sexual (10%) forms of aggression were also important. The rates of verbal, psychologic, and physical aggression were similar to those reported previously for physicians in Belgium and other countries.[11 17 19 20 21 22] The reported rates of sexual aggression were significantly lower than those reported in previous Belgian and international studies, however.[10 21 22]

During their careers, women were slightly more likely than men to experience aggression. Men were more likely to experience physical aggression, whereas women were more likely to experience psychologic and sexual aggression. Our findings are consistent with previous Belgian surveys showing more frequent sexual aggression toward female physicians.[20 21 22] However, we found a much lower rate of sexual aggression against women physicians during their careers than previously reported in international studies. [20 21 22]

Overall, there were no differences in aggression based on spoken language, although sexual violence was more commonly experienced by Dutch-speaking physicians compared to their French-speaking colleagues (12% versus 7%).

Our finding that aggression occurred less commonly during physicians' careers in solo practice compared to community health centres and group practice differed from that of a previous Belgian survey.[22] One may hypothesize that a work setting with several colleagues may be protective against aggression; however, our findings do not support this hypothesis. Working with five or more colleagues appears to be an independent risk factor for aggression. Settings such as community health centres may attract more patients with problematic socio-economic backgrounds; thus, these patients may be more likely to express their demands or emotions with aggression. However, multivariate analysis did not show that physicians working in a community health centres are at increased risk for aggression, which seemed primarily related to number of colleagues, independent of practice type.

Psychiatric institutions were significantly more dangerous workplaces compared to general hospitals, where emergency departments were the most at-risk areas for experiencing aggression. Nearly all physician participants reported that they had experienced aggression during their careers. The finding of higher risk of aggression in psychiatry and emergency departments is consistent with previous studies.[7 19]

Physicians who practiced primarily in outpatient settings were more likely to encounter violence during their careers compared to those who practiced primarily in the hospital. More specifically, outpatient physicians were more likely to experience psychologic and sexual aggression.

Aggression during the preceding 12 months

The logistic regression showed that female sex, younger age or fewer years of experience, a higher number of colleagues, and hospital department were independent risk factors for aggression during the preceding 12 months.

Our study also aimed to describe the various subtypes of aggression encountered by physicians during the 12 months preceding survey administration. Our study showed that 37% of physicians had experienced patient aggression (verbal, 33%; psychologic, 30%; physical, 14%; and sexual, 10%) during the preceding 12 months. These rates were lower than those reported for studies in other countries.[14 17]

The finding that most physicians experienced aggression within their consultation room may be explained by the fact that physicians surveyed spent most of their professional time in their outpatient practice settings. In that setting, more than one type of aggression was frequently reported. Psychologic and verbal aggression often co-occurred.

During the preceding 12 months, women were more likely than men to experience aggression (43% versus 31%). Consistent with a previous report, women were more likely to experience verbal (38% versus 28%), psychologic (36% versus 24%), and sexual (15% versus 5%) aggression compared to men.[14] Women were also more likely to experience aggression in their own practices (40% versus 28%) and during on-call duties (17% versus 12%).

Native language was not associated with most measures of patient-physician aggression, although French-speaking physicians more often experienced severe physical aggression (5% versus 3%) and blackmailing (13% versus 6%).

From the logistic regression speaking French was associated with aggression during the past twelve month and more in particular with physical and psychological aggression.

Our finding that all forms of aggression were experienced more commonly by younger physicians and by those with little practical experience is consistent with results from published international studies.[14 16]

Physicians in solo practice reported less aggression during the preceding 12 months compared to those in group practice and community health centres. Those working in psychiatric institutions had the highest risk for patient aggression among outpatient physicians. In hospitals, the emergency department was the most likely site of aggression.

Overall, there were no differences in reported aggression during the preceding 12 months for

inpatient and outpatient settings. Physical aggression (especially mild and severe physical aggression) and verbal aggression occurred more frequently among physicians whose primary practice was in the hospital. In contrast, sexual aggression was experienced more commonly by physicians who practiced in outpatient settings. The finding that those who practice in outpatient settings experience more aggression may relate to their role as family physicians who make more frequent home calls compared to specialists.

Recommendations for prevention

Preventive action should be focused initially on high-risk groups: young female physicians who work in psychiatric facilities, emergency departments, and community health centres. Campaigns should focus not only on sexual aggression, but other forms of aggression that are frequently encountered by female physicians.

Demographic changes in the physician population should also be considered. As the percentage of female physicians increases, preventive measures should focus on female physicians to reverse the trend of increasing patient-physician aggression.[17 23] Because one third of the male physicians experienced aggression too, they might also benefit from preventive actions. Awareness and de-escalation technics should be trained by all students and young physicians. By optimizing the setting of the daily patient-physician contacts reasons for aggressive behavior can be reduced.

The high rate of patient-physician aggression found in our study differs greatly from the actual number of cases of aggression that are officially reported. To the best of our knowledge, less than 100 cases of patient-physician aggression are reported each year to the National Medical Council. This serious under-reporting needs to be addressed. Physicians should be encouraged to report every case of aggression to the police, the national call point of the National Medical Council, and possibly to an internal local call point. Reporting should be promoted, among other means, by a national awareness campaign.

Strengths and limitations

This study enrolled many Belgian physicians from a diverse geographical area and all medical specialties. Despite the low response rate of 10.25% (3,726 of 36,335 invited physicians participated), the present study is the largest ever internationally published to address this topic, with twice as many participants as the next largest similar peer-reviewed and published study in other countries.[17 24] However, there is a risk of recall- and response bias because the participants might be more motivated to participate if they were ever confronted with aggression. For this reason, the figures regarding the prevalence must be interpreted with caution. But our study population was sufficiently large to demonstrate statistical differences, even among smaller subgroups with regard to the characteristics of physicians at risk for aggression.

Because no paper questionnaires were used, only physicians with internet access could complete the survey. However, no bias is expected from this limitation, as most Belgian physicians use a computer as part of their medical practice. We do not have official figures on the use of computers by Belgian physicians. From the figures of Statbel, the Belgian statistical office, we know that 94% of all Belgians with a high education use the internet daily and 6% at least once weekly.[25]

A second limitation is the demographic data collected for study participants. To ensure privacy, we only collected information that could not be used to identify specific physicians. Consequently, physician specialty and geographic location of their practice or hospital were not collected. In this study, only the main activity and the location of the aggression were collected, per the regulations of the medical ethics committee. Thus, a direct comparison between family physicians and specialists was not possible. Instead, physicians working in hospitals (primarily specialists) were compared to those working in outpatient settings (primarily family physicians).

This paper focusses on the physicians' characteristics related to aggression. Some patient-related factors as there are unmet patient needs, alcohol- or drug abuse or mental illness are reported in another paper focusing on the patient characteristics. In future research attention

should be paid on other causes of aggression against physicians such as crowding in emergency departments, long waiting hours or stressed, overworked and unprepared medical staff.

Lastly, classifications of aggression and violence are subjective and susceptible to varying interpretations. Participants may have differing views of what behaviours constitute aggression. Efforts were made to minimize subjectivity in this area by providing survey participants with explanations of aggression classifications and subtypes.

The fact to consider an event as aggression will depend on several characteristics of the situation and the victim. A Flemish study investigated the relationship between the physicians personality (based on the 'Big Five' personality traits) and the reporting of aggression. Physicians with 'reserved' and 'careless' personality types were more likely to report aggression. Physicians with 'innovative', 'challenging', or 'confident' personality types were also at increased risk, but to a lesser extent.[26]

Some other indicators related to aggression were not included in our study. A relevant study identified the perceptions of staff and patients regarding the factors that lead to violence against nurses and physicians. Both for staff and patients, conditions such as overload, pressure, fatigue, and frustration may lead to violence.[27]

Future research

There are still no exact figures about the incidence and trends of aggression against Belgian physicians and other medical professionals such as nurses or paramedics. Prospective cohort studies with representative study populations would be needed to further study this question. Preventive measures could then by designed and evaluated for effectiveness using prospective interventional research.

CONCLUSIONS

More than 80% of Belgian physicians report experiencing patient aggression during his or her career. Female physicians and those who are younger or less experienced are more

likely to experience aggression during their careers. During the preceding 12 months, one in three Belgian physicians experienced aggression within the physician-patient relationship. Verbal aggression was reported most often, followed by psychologic, physical, and sexual aggression. Female and young physicians were more likely to experience aggression during the preceding 12 months compared to male and older physicians. Psychiatric institutions and emergency departments were the practice sites where physicians were most likely to encounter aggression.

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Table 1. Participant demographics (n = 3,726)

Characteristic	% (n)
Gender	
Men	51,8% (1,930)
Women	48,2% (1,796)
Maternal language	
Dutch	66,5% (2,477)
French	33,5% (1,249)
Median age in years (IQR)	42 (22)
Median medical activity in years (IQR)	13 (21)
Type of medical activity	
Solo practice	22,1% (822)
Duo practice	7,8% (290)
Group practice	17,5% (653)
Community Health Centre	2,1% (79)
Hospital	41,5% (1,545)
Psychiatric institution	2,5% (94)
Homes for the elderly	0,5% (19)
Health insurance company	1,0% (39)
Company control doctor	0,5% (20)
Community childcare centre	0,1% (4)
Prison	0,1% (5)
Occupational medicine	0,8% (28)
Community centre for mental health	0,4% (14)
School doctor	0,3% (10)
Medical expertise	0,2% (7)
Others	2,6% (97)
Number of collaborators in the practice	
0	27,9% (1,039)
1-5	36,2% (1,348)
≥5	35,9% (1,339)

Table 2. Prevalence and types of patient-physician aggression (N = 3,726)

Type of aggression	During career % (n)	During past 12 months %(n)
Total	84,4% (3,144)	36,8% (1,372)
Physical	24,2% (903)	14,4% (538)
Verbal	77,2% (2,877)	33,1% (1,235)
Psychic	41,7% (1,552)	30,0% (1,116)
Sexual	10,1% (378)	9,5% (353)
Other	1,5% (55)	1,4% (51)
None	15,6% (582)	63,2% (2,354)

Table 3. Types of patient aggression experienced by physicians during the preceding 12 months (N = 3,726)

Type of aggression	Men (*n*=1930)	Women (*n*=1796)	*p*-value
Total	30,9%	43,2%	<0,0001
Physical aggression	13,7%	15,3%	0,17
Mild physical aggression (such as pushing, gripping, spitting)	10,2%	10,3%	0,93
Heavy physical aggression (such as biting, kicking, hitting, strangulation)	4,1%	3,4%	0,27
Attack with object, weapon and / or animal	1,5%	2,1%	0,16
Damage to property and / or theft	6,6%	7,9%	0,15
Verbal aggression	28,3%	38,4%	<0,001
Threat with physical aggression	15,4%	15,5%	0,97
Scold and / or insult	27,0%	36,9%	<0,0001
Psychological aggression	24,1%	36,2%	<0,0001
Humiliation	7,6%	14,0%	<0,0001
Blaming and / or intentional guilt delivery	18,9%	31,2%	<0,0001
Threat with suicide and / or automutilation	10,0%	15,2%	<0,0001
Manipulation and / or incitement to illegal things	13,0%	17,0%	0,001
Chantage	6,9%	10,5%	<0,0001
Load and / or reproach	11,2%	10,4%	0,42
Sexual aggression	4,7%	14,6%	<0,0001
Sexual remarks	2,8%	13,0%	<0,0001
Sexual acts by themselves	0,2%	2,0%	<0,0001
Hold on	1,9%	2,9%	0,039
Sexual touch	0,6%	1,3%	0,023
Rape	0,1%	0,1%	1,00[a]
Stalking	1,9%	2,4%	0,27
Others	1,2%	1,6%	0,34
None	69,1%	56,8%	<0,0001

[a] Calculated using two-sided Fisher's exact test

Table 4. Types of aggression experienced by Dutch-speaking and French-speaking physicians during the preceding 12 months (N = 3,726)

Type of aggression	Dutch-speaking (*n*=2477)	French-speaking (*n*=1249)	*p*-value
Total	36,5%	37,5%	0,56
Physical aggression	13,9%	15,5%	0,21
Mild physical aggression (such as pushing, gripping, spitting)	9,9%	11,0%	0,31
Heavy physical aggression (such as biting, kicking, hitting, strangulation)	3,1%	5,0%	0,006
Attack with object, weapon and / or animal	1,5%	2,3%	0,06
Damage to property and / or theft	6,5%	8,7%	0,012
Verbal aggression	33,3%	32,9%	0,83
Threat with physical aggression	14,5%	17,4%	0,022
Scold and / or insult	31,9%	31,5%	0,83
Psychological aggression	29,5%	30,8%	0,41
Humiliation	11,0%	10,0%	0,36
Blaming and / or intentional guilt delivery	23,6%	27,3%	0,013
Threat with suicide and / or automutilation	12,9%	11,8%	0,33
Manipulation and / or incitement to illegal things	15,4%	13,9%	0,23
Chantage	6,4%	13,1%	<0,0001
Load and / or reproach	10,7%	11,0%	0,77
Sexual aggression	9,9%	8,7%	0,27
Sexual remarks	8,0%	7,3%	0,47
Sexual remar by themselves	1,4%	0,4%	0,006
Hold on	2,5%	2,2%	0,57
Sexual touch	0,7%	1,4%	0,041
Rape	0,1%	0,1%	1,00[a]
Stalking	2,0%	2,5%	0,36
Others	0,9%	2,2%	0,001
None	63,5%	62,5%	0,56

[a] Calculated using two-sided Fisher's exact test

Table 5. Types of patient aggression experienced by physicians providing inpatient and outpatient care during the preceding 12 months (N = 3,726)

Type of aggression	Inside hospital (*n*=1639)	Outside hospital (*n*=2087)	*p*-value
Total	38,3%	35,7%	0,11
Physical aggression	16,5%	12,8%	0,002
Mild physical aggression (such as pushing, gripping, spitting)	14,0%	7,3%	<0,0001
Heavy physical aggression (such as biting, kicking, hitting, strangulation)	6,0%	2,0%	<0,0001
Attack with object, weapon and / or animal	1,6%	1,8%	0,69
Damage to property and / or theft	6,7%	7,7%	0,23
Verbal aggression	35,8%	31,0%	0,002
Threat with physical aggression	19,5%	12,3%	<0,0001
Scold and / or insult	34,5%	29,6%	0,001
Psychological aggression	30,1%	29,9%	0,88
Humiliation	10,9%	10,4%	0,64
Blaming and / or intentional guilt delivery	25,6%	24,2%	0,32
Threat with suicide and / or automutilation	13,3%	11,9%	0,19
Manipulation and / or incitement to illegal things	11,4%	17,7%	<0,0001
Chantage	8,7%	8,6%	0,87
Load and / or reproach	11,8%	10,1%	0,11
Sexual aggression	8,3%	10,4%	0,030
Sexual remarks	7,1%	8,3%	0,17
Sexual acts by themselves	0,6%	1,4%	0,020
Hold on	2,3%	2,4%	0,71
Sexual touch	0,6%	1,1%	0,09
Rape	0,0%	0,2%	0,14[a]
Stalking	1,9%	2,4%	0,30
Others	0,9%	1,7%	0,035
None	61,7%	64,3%	0,11

[a] Calculated using two-sided Fisher's exact test

Table 6. Logistic regression for aggression type

Variables	Sig.	OR	95% CI for OR
Aggression during the career			
Gender	0.007	0.679	0.512 – 0.901
Age	0.008	1.168	1.041 – 1.311
Number of collaborators	0.024	1.212	1.025 – 1.432
Aggression during the past 12 months			
Language	0.016	1.326	1.054 – 1.669
Gender	0.001	0.695	0.556 – 0.868
Years of experience	<0.001	0.775	0.702 – 0.855
Hospital department	0.001	1.012	1.005 – 1.019
Number of collaborators	0.003	1.250	1.081 – 1.446
Physical aggression during past 12 months			
Language	0.005	1.535	1.136 – 2.075
Age	<0.001	1.291	1.128 – 1.478
Hospital department	<0.001	1.020	1.010 – 1.030
Number of collaborators	0.004	1.350	1.099 – 1.659
Verbal aggression during past 12 months			
Gender	0.010	0.744	0.594 – 0.933
Years of experience	<0.001	0.781	0.706 – 0.863
Hospital department	0.001	1.012	1.005 – 1.020
Number of collaborators	0.011	1.211	1.045 – 1.404
Psychological aggression during past 12 months			
Language	<0.001	1.595	1.249 – 2.035
Gender	<0.001	0.647	0.509 – 0.822
Years of experience	<0.001	0.785	0.705 – 0.874
Hospital department	<0.001	1.014	1.006 – 1.022
Number of collaborators	0.001	1.311	1.119 – 1.535
Sexual aggression during past 12 months			
Gender	0.001	0.472	0.307 – 0.725
Years of experience	0.004	0.737	0.600 – 0.906
Hospital department	0.002	1.022	1.008 – 1.038

FIGURE LEGENDS

Figure 1. Patient aggression experienced by physicians during the preceding 12 months, by year of physician birth

Figure 2. Patient aggression experienced by physicians during the preceding 12 months, by number of years in practice

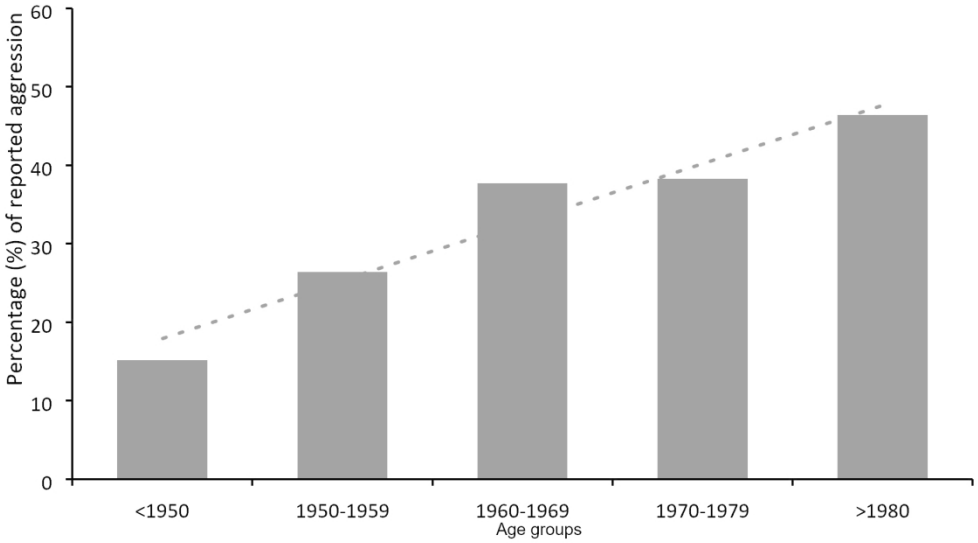

Figure 1. Patient aggression experienced by physicians during the preceding 12 months, by year of physician birth

169x97mm (300 x 300 DPI)

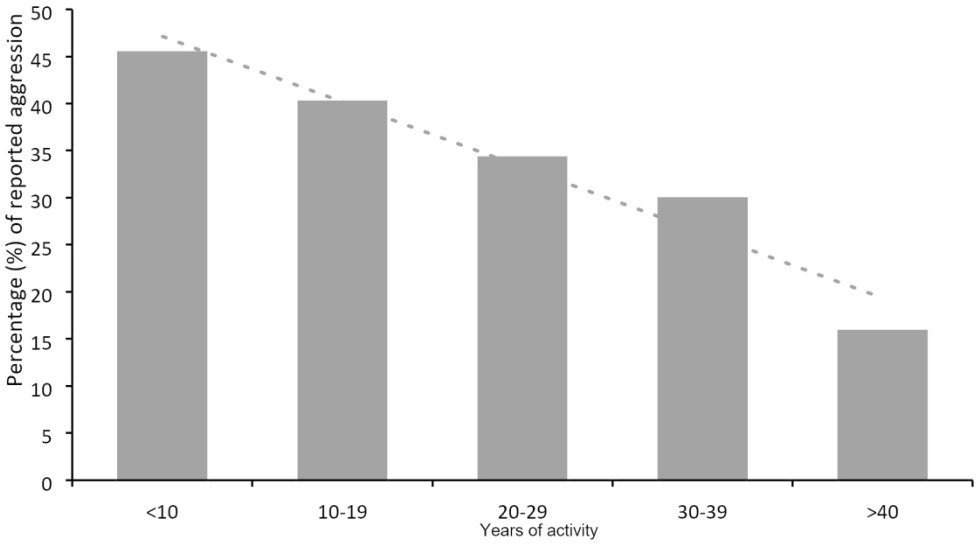

Figure 2. Patient aggression experienced by physicians during the preceding 12 months, by number of years in practice

169x97mm (300 x 300 DPI)

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	4
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	6-8
Objectives	3	State specific objectives, including any prespecified hypotheses	8
Methods			
Study design	4	Present key elements of study design early in the paper	9-10
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	8-10
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	9-10
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	8-9
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	8-10
Bias	9	Describe any efforts to address potential sources of bias	9
Study size	10	Explain how the study size was arrived at	9
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	10-11
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	10-11
		(*b*) Describe any methods used to examine subgroups and interactions	10-11
		(*c*) Explain how missing data were addressed	10-11
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	10-11
		(*e*) Describe any sensitivity analyses	10-11
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	11
		(b) Give reasons for non-participation at each stage	11
		(c) Consider use of a flow diagram	11
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	11-12 Tabl 1
		(b) Indicate number of participants with missing data for each variable of interest	11
Outcome data	15*	Report numbers of outcome events or summary measures	11-16
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear	11-16

		which confounders were adjusted for and why they were included	
		(*b*) Report category boundaries when continuous variables were categorized	11-16
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	11-16
Discussion			
Key results	18	Summarise key results with reference to study objectives	16-17
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	20-21
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	21-22
Generalisability	21	Discuss the generalisability (external validity) of the study results	19
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	NA

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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A cross-sectional study on patient-physician aggression in Belgium: physician characteristics and aggression types

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A cross-sectional study on patient-physician aggression in Belgium: physician characteristics and aggression types

Running title: Patient-physician aggression

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Declaration of interests

All authors declare no support from any organisation for the submitted work, no financial relationships with any organisations that might have an interest in the submitted work in the previous three years, no other relationships or activities that could appear to have influenced the submitted work.

Transparency declaration

The lead author (the manuscript's guarantor) affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned have been explained.

Ethics committee approval

A statement is included in the manuscript, including the name of the committee granting approval.

Clinical trial registration

This study is a cross-sectional survey and no intervention was planned or done. For these reasons the study was not registered as a clinical trial.

Role of the funding source

The study was unfunded.

Data sharing statement

Additional unpublished data from the study are available to all authors. They will be used to write two more papers on the characteristics of the patient/aggressor and on the preventive measure against patient-physician aggression.

The contributions of the different authors to this manuscript are as follows: -

1. Lennart De Jager: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
2. Michel Deneyer: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
3. Ronald Buyl: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
4. Sophie Roelandt: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
5. Ralph Pacqueu: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted
6. Dirk Devroey: conception, design, analysis and interpretation of data, drafting of the manuscript and final approval of the version submitted

ABSTRACT

Objectives: The aim of this Belgian research study was to describe the characteristics of physicians who are at increased risk for patient-physician aggression. Secondly, aggression subtypes were described and data were provided on the prevalence of patient-physician aggression in Belgium.

Design: Cross-sectional survey

Setting: Primary and secondary care in- and outside hospitals

Participants: Any physician who had worked in Belgium for the preceding 12 months was eligible to participate (N=34,648).

Main Outcome Measures: An online, original questionnaire was used to obtain physician characteristics (e.g. age, sex, native language), department, working conditions and contact with aggressive patients during their career and during the preceding 12 months.

Results: The questionnaire was completed by 4,930 participants and 3,726 (76%) were valid to take into account for statistics. During the preceding 12 months, 37% had been victims of aggression: 33% experienced verbal aggression, 30% psychologic, 14% physical, and 10% sexual. Multiple answers were allowed. Women and younger physicians were more likely to experience aggression. Psychiatric departments and emergency departments were the settings most commonly associated with aggression. Physicians who provided primarily outpatient care were more subject to aggression.

Conclusion: Belgian physicians experience several forms of aggression. Those most at-risk of aggression are young and female physicians who work in outpatient, emergency, or psychiatric settings.

Keywords: violence, aggression, patient-physician relationship

Strengths and limitations of this study

1. This study is one of the largest ever to address the topic of patient-physician aggression.
2. Only physicians with internet access could complete the survey but most Belgian physicians use a computer as part of their medical practice.
3. To ensure privacy, physician specialty and geographic location of their practice or hospital were not collected.
4. Classifications of aggression and violence are subjective and susceptible to varying interpretations.

INTRODUCTION

On December 1, 2015, 64-year-old family physician Patrik Roelandt was murdered during a house call to a patient. The murderer was known to the police and had a past criminal record, of which his physician was unaware. He is only one of many physicians who have experienced patient-physician aggression and violence. The physician-patient relationship is complex and based on mutual trust, with physicians serving as helpers and patients as care-seekers. There is often a very small difference between patient assertiveness and aggression in the physician-patient relationship.

International aggression research

In 2000, the World Health Organization, in collaboration with the International Labour Office, the International Council of Nurses, and Public Services International, investigated workplace violence in the healthcare sector.[1] For that study, a research tool was designed to assess workplace violence experienced by physicians and other healthcare workers.[2] Di Martino used this same tool in 2002 to synthesize the results of rural studies of violence against healthcare workers in several countries.[3] One of his conclusions was that more attention was needed to address aggression in nearly all countries studied. Furthermore, a report with preventive guidelines was prepared based on the results of these studies.[4]

In 2014, the International Society of Orthopaedic Surgery and Traumatology (SICOT) statement in Hyderabad, India called on governments to provide better registration systems, awareness of aggressive populations, stricter penalties, and protections for healthcare workers.[5 6]

In 2016, a review was published about the current state of aggression against healthcare workers in the US.[7] Little was known at that time about aggression in primary care settings; emergency and psychiatric departments had been the most well-studied environments, and were thought to be the most dangerous. Physicians and other healthcare professionals were at risk, however. The authors suggested that stricter penalties be placed for perpetrators of violence against healthcare workers and that easy procedures should be implemented to

report incidents. After that report, several investigations were conducted to assess aggression in emergency departments in the US. About three-fourths of physicians in emergency departments reported experiencing some form of violence, and one-fourth of staff members felt unsafe.[8 9]

A large US study showed that 48% of female physicians experienced sex-based intimidation, and 37% had experienced sexual harassment during their careers.[10]

A large cross-sectional study of Canadian physicians showed that 98% had experienced minor aggression, 75% severe aggression, and 39% very severe aggression.[11]

In China, violence against physicians is a major problem.[12] We speculate that this violence is related to the healthcare organization system in China, but research on this subject is still ongoing.

A Japanese study found a relationship between patient-physician aggression and posttraumatic stress disorder, with a violence incidence of 0.20 x10-3 events per practice hour.[13]

In 2011, a cross-sectional study of aggression against Australian family physicians showed that, during the preceding 12 months, 58% had experienced verbal aggression, 18% material damage or theft, 6% physical aggression, 4% stalking, 6% sexual harassment, and 0.1% sexual violence.[14] Physicians with less professional experience were more likely to have experienced verbal aggression compared to their colleagues, and women were more likely to have experienced sexual harassment compared to men.

In 2005, a Dutch study reported sexual harassment during medical internship.[15] Another study reported that Dutch paediatricians with less professional experience were more likely to encounter patient-physician aggression.[16]

In 2015, a German study reported that 91% of family physicians had been victims of patient aggression during their careers, with 73% experiencing aggression during the preceding 12 months.[17] Serious aggression had been experienced by 23% of those physicians during their careers and 11% during the preceding 12 months. Most participants still felt safe at their practice site, but 66% of female and 34% of male respondents felt insecure on home visits.

Belgian aggression research

In 1998, researchers using a safety survey in Belgian hospitals showed that psychiatric departments had higher rates of patient-physician aggression.[18] Since starting their work in the psychiatric department, 38% of physicians had experienced theft, 13% physical aggression, and 70% verbal aggression. Although 86% of physicians surveyed reported that they did not feel unsafe at their hospital, female physicians did feel insecure in the evenings, and insecurity was more prevalent in hospitals where French was spoken compared to those where Dutch was spoken.

Since that study in 1998, several small surveys have been conducted, but none are representative of the Belgian population, and none have been published in scientific journals. Although there is sufficient evidence that physicians are at risk for patient aggression, little effort has been made to identify which physicians are at increased risk of aggression.

The aim of this study was to describe the characteristics of physicians who are at increased risk for patient aggression in Belgium. We investigated possible associations between specific types of aggression and physician characteristics, and whether aggression occurs more frequently in inpatient or outpatient settings.

METHODS

Questionnaire

An online questionnaire in Dutch and French was developed for this cross-sectional survey (supplementary file). The questionnaire was available from March 28, 2017 to April 25, 2017 on the LimeSurvey platform (Germany, Version 2.05+). Paper questionnaires were not provided. Participants had to read the online informed consent and agree to participate by clicking the corresponding key before they could participate in the study.

The questionnaire first asked participants which of the four major types of aggression (physical, verbal, sexual or psychologic) the physician had experienced during his or her

career and during the preceding 12 months. Questions about the preceding 12 months were more detailed than the career questions. These questions were based on the questionnaire used in the German study by Vorderwülbecke et al.[17] We added psychologic violence which was not include in the German questionnaire. We used just as in the German study the 12-month period for the detailed questions on the "most recent aggression" because the recall bias might be too important for a longer period. Experiences with aggression over the last 12 months were also questioned in a German survey called Arztemonitor 2018. With over 8000 answering physicians it is one of the biggest studies on this subject but unfortunately this study was not published internationally.[18]

Physicians were also asked about aggression subtypes and places where aggression had occurred. Next, personal and demographic data were collected for each participant. To preserve participant privacy, questions were limited to sex, year of birth, number of years of practice, main practice activity, and number of co-workers. Based on these data, it should be impossible to track down which physicians completed the survey.

Participants

In Belgium, all physicians are required to register with the National Medical Council. The council sent an email to the 36,335 active registered physicians with a link to the survey and a request to complete the questionnaire. An initial email was sent on March 28, 2017 and a reminder email was sent on April 13, 2017. Only active physicians who had worked in Belgium for the past 12 months were eligible to participate in the study. Physicians also had to have computer access, an email address, and needed to understand Dutch or French.

Patient and public involvement

Patients and the public were not involved in this study. Given the sensitive subject of patient-physician aggression, we chose not to include the patient's point of view in this study. In future smaller-scale research this could be done, for example, by means of personal

interviews sometime after the registration of the aggression. The input of the public and the patient could also be requested in the development and implementation of the study.

Difference between aggression and violence

The difference between aggression and violence is not always very clear. The terms aggression and violence are often used interchangeably, although the two are not synonymous. Both concepts are also subjective, with overlapping meanings that can be interpreted differently by different persons. Aggression is any behaviour that can potentially harm people or objects. This behaviour can occur at the physical or psychologic level. Aggression can manifest as abusive language, damage to objects, violent threats to others, or assaults on persons (including the aggressor himself or herself). Violence is physical assault with intent to harm. Not all aggression leads to violence; violence is a step further than aggression. Throughout this paper, we preferentially use the term aggression. We consider four major classes of aggression: physical, verbal, psychologic, and sexual.

Ethical review

The protocol and questionnaire were reviewed by the Medical Ethics Committee of the University Hospital Brussels and approved on March 8, 2017.

Statistical analysis

Statistical analysis was completed using LimeSurvey, Microsoft Excel 2016, and IBM SPSS Statistics 24. Partially completed or unsaved questionnaires were not included in the analysis.

For the statistical analysis, variables were considered as independent (ie, explanatory or input) or dependent (ie, outcome or target).

Descriptive statistics are presented as frequencies (n, %) for categorical variables and medians (and interquartile ranges [IRs]) for continuous outcomes. Univariate analysis was performed using Chi-square tests or Fisher's exact test where appropriate. For ordinal

variables, *P* values were calculated using the linear-by-linear association. The 95% confidence interval (CI) was calculated using the standard error (SE), as given by the formula SE = √ [p (1-p) / n]. For large cross-tables with expected values less than five, the Fisher's exact test was used for subgroups using the Monte Carlo method (95% CI and 10,000 samples).

A logistic regression model was developed using aggression during career, aggression during the preceding 12 months, physical aggression, verbal aggression, psychologic aggression, and sexual aggression as dependent variables. Age (five groups), sex, language, years of practice experience (five groups), medical department, and number of colleagues (three groups) were used as independent variables. A stepwise backward (conditional) logistic regression was performed for each of these independent variables. All tests were performed using an α of 0.05.

RESULTS

Participant demographics

The National Medical Council has a register with all Belgian physicians. All 36,333 physicians of the register received an email with an invitation to participate in the study. The 1,685 physicians who did not work in Belgium for the preceding 12 months received also an invitation to participate but they were excluded at the beginning of the questionnaire. The questionnaire was completed by 4,930 participants and 3,726 questionnaires were valid to take into account for statistics.

Most respondents were male (52%), and most completed the survey in Dutch (67%) (Table 1). Their median age was 42 years and the median number of years in medical practice was 13. Both continuous variables had non-normal distributions, with *P* values of less than .0001 for both the Kolmogorov-Smirnov and the Shapiro-Wilk tests. The participants were representative of the Belgian physicians with respect to age, gender and maternal language.

Forty-two percent of respondents worked in a hospital, whereas 22% had a solo outpatient practice, and 18% were part of a group practice. Participants from nearly all hospital departments participated in the study. The most represented departments were anaesthesiology (10.6% [n = 164]), radiology (8.7% [n = 134]), paediatrics (6.6% [n = 102]), orthopaedics (6.2% [n = 96]), and the emergency department (5.8% [n = 89]).

Prevalence

Table 2 shows the reported prevalence and types of patient-physician aggression. Multiple answers were allowed for responses, as participants may have experienced multiple types of aggression in multiple practice locations. Eighty-four percent of participants had experienced aggression during their careers, with 37% having this experience during the preceding 12 months. Of those who encountered aggression during the past 12 months, 91% experienced it in a consultation room, 34% outside the consultation room, and 39% during emergency medical services in hospitals or in primary care.

Differences between sexes

More women than men encountered patient-physician aggression during their careers (87% versus 82%; $P < .0001$) and during the preceding 12 months (43% versus 31%; $P < .001$). During their careers, more men than women had experienced physical aggression (27% and 21%, respectively; $P < .001$), whereas more women than men had experienced psychologic aggression (35% and 49%, respectively; $P < .001$) and sexual aggression (4% and 17%, respectively; $P < .001$). There were no differences between men and women with respect to experience of verbal aggression during the careers.

Table 3 shows the proportion of participants who encountered patient-physician aggression during the preceding 12 months and the subtypes of aggression experienced by both men and women. During this period, women and men experienced similar rates of physical aggression, but verbal aggression was experienced by 38% of women compared to 28% of men ($P < .001$). Scolding and insulting were particularly common forms of verbal aggression

against women. Women also experienced more psychologic aggression compared to men (38% and 28%, respectively; $P < .001$). Almost all subtypes of psychologic aggression were more frequently experienced by women. Sexual aggression was experienced by 15% of female physicians compared to 5% of male physicians ($P < .001$). Of the sexual aggression subtypes, sexual remark aggression and sexual acts by patients on themselves occurred more commonly among women than men.

During the preceding 12 months, more women (40%) than men (28%) experienced aggression in their own consultation rooms ($P < .001$). Women also encountered more aggression compared to men during on-call duties (17% compared to 12%; $P < .001$).

Patient aggression by language spoken

Dutch-speaking (n = 2,477) and French-speaking (n = 1,249) physicians experienced similar rates of aggression during their careers (85% and 84% respectively; $P = .781$) and during the preceding 12 months (36% and 38%, respectively; $P = .561$). However, compared to those who spoke French, those who spoke Dutch experienced more verbal aggression (75% and 79%, respectively; $P = .004$) and sexual aggression (7% and 12%, respectively; $P < .001$) during their careers.

Table 4 shows the proportion of participants who experienced patient-physician aggression during the preceding 12 months and details the subtypes of aggression by language spoken. During the preceding 12 months, French-speaking physicians experienced more physical aggression than their Dutch-speaking colleagues. Those who spoke French more often reported severe physical violence (5% compared to 3%; $P = .006$) and damage or theft (9% compared to 7%; $P = .012$). Although the rate of verbal aggression did not differ between groups, physicians who spoke French experienced more threats of physical aggression (15% and 17%, respectively; $P = .022$). Although the rates of psychologic aggression did not differ, blaming and blackmailing were more commonly reported by the French-speaking participants ($P = .013$ and $P < .001$, respectively). Reports of sexual touching were more

common for French-speaking participants (*P* = .041), whereas reports of patient sexual acts were more common for Dutch-speaking participants (*P* = .006).

With respect to location, French-speaking physicians were more likely to encounter aggression outside of their consultation rooms compared to their Dutch-speaking colleagues (15% and 11%, respectively; *P* = .001).

Patient aggression by physician age

Younger physicians were more likely to experience patient-physician aggression during the preceding 12 months (Figure 1), with 46% of those born in 1980 or later experiencing aggression, compared to 15% of those born before 1950 (*P* for trend < .001). This trend of increasing aggression with decreasing age was observed for all types of aggression. For physical aggression, the rate increased from 11% among the oldest physicians to 18% among the youngest physicians (*P* for trend < .001). Verbal aggression increased from 13% to 43% (*P* for trend < .001), and psychologic aggression increased from 11% to 39% (*P* for trend < .001). Furthermore, sexual aggression increased from 4% to 14% (*P* for trend < .001).

During the preceding 12 months, a shorter length of professional practice was also associated with increasing rates of aggression (Figure 2).

Workplace and department

Physicians working in a solo practice (30%) encountered less aggression during the preceding 12 months compared to those working in a group practice (39%, *P* < .001), community health centre (52%, *P* < .001) or hospital (36%, *P* < .003). Workplaces with the highest risk for aggression during the preceding 12 months were psychiatric institutions (73%), centres for mental health (71%), health insurance companies (67%), and community health centres (52%).

The most dangerous work environments for aggression within hospitals were the emergency (82%), psychiatry (64%), neurology (58%), geriatrics (53%), and internal medicine (52%)

departments. All other departments were associated with aggression reports of less than 50% during the past 12 months.

During their careers, 83% of participants providing inpatient care experienced aggression, compared to 85% of those providing outpatient care (*P* = .046). Those working outside a hospital were more likely to experience psychologic and sexual aggression compared to those working inside a hospital (45% versus 37%, *P* < .001; and 12% versus 8%, *P* < .001). During the preceding 12 months, outpatient and inpatient physicians reported similar rates of patient aggression (Table 5). However, those working inside the hospital reported more physical aggression compared to those working in outpatient settings (17% and 13%, respectively; *P* = .002). Moderate and severe physical aggression occurred more common inside the hospital. Verbal aggression and its subtypes occurred more frequently in the hospital compared to the outpatient setting (36% versus 31%; *P* = .002). There was no difference in the rate of psychologic aggression between outpatient and inpatient settings; however, manipulation or incitement to illegal actions was more common in outpatient than inpatient settings (18% and 11%, respectively; *P* < .0001). Sexual aggression by patients toward physicians was also more common in outpatient (10%) compared to inpatient settings (8%; *P* = .03), especially for sexual acts by patients.

Practice structure was also associated with aggression. An increasing number of professional partners was associated increasing violence (*P* for trend < .001). All types of violence had a similar statistical trend (*P* < .001) except for sexual violence (*P* for trend = .015).

Logistic regression

In logistic aggression analysis, age or years of experience were correlated with aggression (Table 6). Each variable was related to a different form of aggression: younger age was related to physical aggression and increased aggression during the career, whereas fewer years of professional experience was related to other types of aggression.

Sex was a risk factor in five out of six logistics regression analyses, with females being more at risk for all types of aggression except physical aggression.

The number of professional colleagues was also positively associated with five out of six forms of aggression. Increasing numbers of professional partners was related to increasing risk for patient-physician aggression.

The inpatient setting was also related to most types of aggression, but it was not possible to determine from the logistic regression which departments were most at-risk because the variable was not ordinal. It was confirmed, however, that risk differs by hospital department.

DISCUSSION

Aggression during career

This research aimed to characterize the current state of patient aggression toward physicians in Belgium. During their careers, most physicians had experienced some type of aggression within the physician-patient relationship. Verbal aggression (77%) occurred most commonly, but psychologic (42%), physical (24%), and sexual (10%) forms of aggression were also important. The rates of verbal, psychologic, and physical aggression were similar to those reported previously for physicians in Belgium and other countries.[11 17 19 20 21 22] The reported rates of sexual aggression were significantly lower than those reported in previous Belgian and international studies, however.[10 21 22]

During their careers, women were slightly more likely than men to experience aggression. Men were more likely to experience physical aggression, whereas women were more likely to experience psychologic and sexual aggression. Our findings are consistent with previous Belgian surveys showing more frequent sexual aggression toward female physicians.[20 21 22] However, we found a much lower rate of sexual aggression against women physicians during their careers than previously reported in international studies. [20 21 22]

Overall, there were no differences in aggression based on spoken language, although sexual violence was more commonly experienced by Dutch-speaking physicians compared to their French-speaking colleagues (12% versus 7%).

Our finding that aggression occurred less commonly during physicians' careers in solo practice compared to community health centres and group practice differed from that of a previous Belgian survey.[22] One may hypothesize that a work setting with several colleagues may be protective against aggression; however, our findings do not support this hypothesis. Working with five or more colleagues appears to be an independent risk factor for aggression. Settings such as community health centres may attract more patients with problematic socio-economic backgrounds; thus, these patients may be more likely to express their demands or emotions with aggression. However, multivariate analysis did not show that physicians working in a community health centres are at increased risk for aggression, which seemed primarily related to number of colleagues, independent of practice type.

Psychiatric institutions were significantly more dangerous workplaces compared to general hospitals, where emergency departments were the most at-risk areas for experiencing aggression. Nearly all physician participants reported that they had experienced aggression during their careers. The finding of higher risk of aggression in psychiatry and emergency departments is consistent with previous studies.[7 19]

Physicians who practiced primarily in outpatient settings were more likely to encounter violence during their careers compared to those who practiced primarily in the hospital. More specifically, outpatient physicians were more likely to experience psychologic and sexual aggression.

Aggression during the preceding 12 months

The logistic regression showed that female sex, younger age or fewer years of experience, a higher number of colleagues, and hospital department were independent risk factors for aggression during the preceding 12 months.

Our study also aimed to describe the various subtypes of aggression encountered by physicians during the 12 months preceding survey administration. Our study showed that 37% of physicians had experienced patient aggression (verbal, 33%; psychologic, 30%; physical, 14%; and sexual, 10%) during the preceding 12 months. These rates were lower than those reported for studies in other countries.[14 17]

The finding that most physicians experienced aggression within their consultation room may be explained by the fact that physicians surveyed spent most of their professional time in their outpatient practice settings. In that setting, more than one type of aggression was frequently reported. Psychologic and verbal aggression often co-occurred.

During the preceding 12 months, women were more likely than men to experience aggression (43% versus 31%). Consistent with a previous report, women were more likely to experience verbal (38% versus 28%), psychologic (36% versus 24%), and sexual (15% versus 5%) aggression compared to men.[14] Women were also more likely to experience aggression in their own practices (40% versus 28%) and during on-call duties (17% versus 12%).

Native language was not associated with most measures of patient-physician aggression, although French-speaking physicians more often experienced severe physical aggression (5% versus 3%) and blackmailing (13% versus 6%).

From the logistic regression speaking French was associated with aggression during the past twelve month and more in particular with physical and psychological aggression.

Our finding that all forms of aggression were experienced more commonly by younger physicians and by those with little practical experience is consistent with results from published international studies.[14 16]

Physicians in solo practice reported less aggression during the preceding 12 months compared to those in group practice and community health centres. Those working in psychiatric institutions had the highest risk for patient aggression among outpatient physicians. In hospitals, the emergency department was the most likely site of aggression.

Overall, there were no differences in reported aggression during the preceding 12 months for

inpatient and outpatient settings. Physical aggression (especially mild and severe physical aggression) and verbal aggression occurred more frequently among physicians whose primary practice was in the hospital. In contrast, sexual aggression was experienced more commonly by physicians who practiced in outpatient settings. The finding that those who practice in outpatient settings experience more aggression may relate to their role as family physicians who make more frequent home calls compared to specialists.

Recommendations for prevention

Preventive action should be focused initially on high-risk groups: young female physicians who work in psychiatric facilities, emergency departments, and community health centres. Campaigns should focus not only on sexual aggression, but other forms of aggression that are frequently encountered by female physicians.

Demographic changes in the physician population should also be considered. As the percentage of female physicians increases, preventive measures should focus on female physicians to reverse the trend of increasing patient-physician aggression.[17 23] Because one third of the male physicians experienced aggression too, they might also benefit from preventive actions. Awareness and de-escalation technics should be trained by all students and young physicians. By optimizing the setting of the daily patient-physician contacts reasons for aggressive behavior can be reduced.

The high rate of patient-physician aggression found in our study differs greatly from the actual number of cases of aggression that are officially reported. To the best of our knowledge, less than 100 cases of patient-physician aggression are reported each year to the National Medical Council. This serious under-reporting needs to be addressed. Physicians should be encouraged to report every case of aggression to the police, the national call point of the National Medical Council, and possibly to an internal local call point. Reporting should be promoted, among other means, by a national awareness campaign.

Strengths and limitations

This study enrolled many Belgian physicians from a diverse geographical area and all medical specialties. Despite the low response rate of 10.25% (3,726 of 36,335 invited physicians participated), the present study is the largest ever internationally published to address this topic, with twice as many participants as the next largest similar peer-reviewed and published study in other countries.[17 24] However, there is a risk of recall- and response bias because the participants might be more motivated to participate if they were ever confronted with aggression. For this reason, the figures regarding the prevalence must be interpreted with caution. But our study population was sufficiently large to demonstrate statistical differences, even among smaller subgroups with regard to the characteristics of physicians at risk for aggression.

Because no paper questionnaires were used, only physicians with internet access could complete the survey. However, no bias is expected from this limitation, as most Belgian physicians use a computer as part of their medical practice. We do not have official figures on the use of computers by Belgian physicians. From the figures of Statbel, the Belgian statistical office, we know that 94% of all Belgians with a high education use the internet daily and 6% at least once weekly.[25]

A second limitation is the demographic data collected for study participants. To ensure privacy, we only collected information that could not be used to identify specific physicians. Consequently, physician specialty and geographic location of their practice or hospital were not collected. In this study, only the main activity and the location of the aggression were collected, per the regulations of the medical ethics committee. Thus, a direct comparison between family physicians and specialists was not possible. Instead, physicians working in hospitals (primarily specialists) were compared to those working in outpatient settings (primarily family physicians).

This paper focusses on the physicians' characteristics related to aggression. Some patient-related factors as there are unmet patient needs, alcohol- or drug abuse or mental illness are reported in another paper focusing on the patient characteristics. In future research attention

should be paid on other causes of aggression against physicians such as crowding in emergency departments, long waiting hours or stressed, overworked and unprepared medical staff.

Lastly, classifications of aggression and violence are subjective and susceptible to varying interpretations. Participants may have differing views of what behaviours constitute aggression. Efforts were made to minimize subjectivity in this area by providing survey participants with explanations of aggression classifications and subtypes.

The fact to consider an event as aggression will depend on several characteristics of the situation and the victim. A Flemish study investigated the relationship between the physicians personality (based on the 'Big Five' personality traits) and the reporting of aggression. Physicians with 'reserved' and 'careless' personality types were more likely to report aggression. Physicians with 'innovative', 'challenging', or 'confident' personality types were also at increased risk, but to a lesser extent.[26]

Some other indicators related to aggression were not included in our study. A relevant study identified the perceptions of staff and patients regarding the factors that lead to violence against nurses and physicians. Both for staff and patients, conditions such as overload, pressure, fatigue, and frustration may lead to violence.[27]

Future research

There are still no exact figures about the incidence and trends of aggression against Belgian physicians and other medical professionals such as nurses or paramedics. Prospective cohort studies with representative study populations would be needed to further study this question. Preventive measures could then by designed and evaluated for effectiveness using prospective interventional research.

CONCLUSIONS

More than 80% of Belgian physicians report experiencing patient aggression during his or her career. Female physicians and those who are younger or less experienced are more

likely to experience aggression during their careers. During the preceding 12 months, one in three Belgian physicians experienced aggression within the physician-patient relationship. Verbal aggression was reported most often, followed by psychologic, physical, and sexual aggression. Female and young physicians were more likely to experience aggression during the preceding 12 months compared to male and older physicians. Psychiatric institutions and emergency departments were the practice sites where physicians were most likely to encounter aggression.

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Table 1. Participant demographics (n = 3,726)

Characteristic	% (n)
Gender	
Men	51,8% (1,930)
Women	48,2% (1,796)
Maternal language	
Dutch	66,5% (2,477)
French	33,5% (1,249)
Median age in years (IQR)	42 (22)
Median medical activity in years (IQR)	13 (21)
Type of medical activity	
Solo practice	22,1% (822)
Duo practice	7,8% (290)
Group practice	17,5% (653)
Community Health Centre	2,1% (79)
Hospital	41,5% (1,545)
Psychiatric institution	2,5% (94)
Homes for the elderly	0,5% (19)
Health insurance company	1,0% (39)
Company control doctor	0,5% (20)
Community childcare centre	0,1% (4)
Prison	0,1% (5)
Occupational medicine	0,8% (28)
Community centre for mental health	0,4% (14)
School doctor	0,3% (10)
Medical expertise	0,2% (7)
Others	2,6% (97)
Number of collaborators in the practice	
0	27,9% (1,039)
1-5	36,2% (1,348)
≥5	35,9% (1,339)

Table 2. Prevalence and types of patient-physician aggression (N = 3,726)

Type of aggression	During career % (n)	During past 12 months %(n)
Total	84,4% (3,144)	36,8% (1,372)
Physical	24,2% (903)	14,4% (538)
Verbal	77,2% (2,877)	33,1% (1,235)
Psychic	41,7% (1,552)	30,0% (1,116)
Sexual	10,1% (378)	9,5% (353)
Other	1,5% (55)	1,4% (51)
None	15,6% (582)	63,2% (2,354)

Table 3. Types of patient aggression experienced by physicians during the preceding 12 months (N = 3,726)

Type of aggression	Men (*n*=1930)	Women (*n*=1796)	*p*-value
Total	30,9%	43,2%	<0,0001
Physical aggression	13,7%	15,3%	0,17
Mild physical aggression (such as pushing, gripping, spitting)	10,2%	10,3%	0,93
Heavy physical aggression (such as biting, kicking, hitting, strangulation)	4,1%	3,4%	0,27
Attack with object, weapon and / or animal	1,5%	2,1%	0,16
Damage to property and / or theft	6,6%	7,9%	0,15
Verbal aggression	28,3%	38,4%	<0,001
Threat with physical aggression	15,4%	15,5%	0,97
Scold and / or insult	27,0%	36,9%	<0,0001
Psychological aggression	24,1%	36,2%	<0,0001
Humiliation	7,6%	14,0%	<0,0001
Blaming and / or intentional guilt delivery	18,9%	31,2%	<0,0001
Threat with suicide and / or automutilation	10,0%	15,2%	<0,0001
Manipulation and / or incitement to illegal things	13,0%	17,0%	0,001
Chantage	6,9%	10,5%	<0,0001
Load and / or reproach	11,2%	10,4%	0,42
Sexual aggression	4,7%	14,6%	<0,0001
Sexual remarks	2,8%	13,0%	<0,0001
Sexual acts by themselves	0,2%	2,0%	<0,0001
Hold on	1,9%	2,9%	0,039
Sexual touch	0,6%	1,3%	0,023
Rape	0,1%	0,1%	1,00[a]
Stalking	1,9%	2,4%	0,27
Others	1,2%	1,6%	0,34
None	69,1%	56,8%	<0,0001

[a] Calculated using two-sided Fisher's exact test

Table 4. Types of aggression experienced by Dutch-speaking and French-speaking physicians during the preceding 12 months (N = 3,726)

Type of aggression	Dutch-speaking (*n*=2477)	French-speaking (*n*=1249)	*p*-value
Total	36,5%	37,5%	0,56
Physical aggression	13,9%	15,5%	0,21
Mild physical aggression (such as pushing, gripping, spitting)	9,9%	11,0%	0,31
Heavy physical aggression (such as biting, kicking, hitting, strangulation)	3,1%	5,0%	0,006
Attack with object, weapon and / or animal	1,5%	2,3%	0,06
Damage to property and / or theft	6,5%	8,7%	0,012
Verbal aggression	33,3%	32,9%	0,83
Threat with physical aggression	14,5%	17,4%	0,022
Scold and / or insult	31,9%	31,5%	0,83
Psychological aggression	29,5%	30,8%	0,41
Humiliation	11,0%	10,0%	0,36
Blaming and / or intentional guilt delivery	23,6%	27,3%	0,013
Threat with suicide and / or automutilation	12,9%	11,8%	0,33
Manipulation and / or incitement to illegal things	15,4%	13,9%	0,23
Chantage	6,4%	13,1%	<0,0001
Load and / or reproach	10,7%	11,0%	0,77
Sexual aggression	9,9%	8,7%	0,27
Sexual remarks	8,0%	7,3%	0,47
Sexual remar by themselves	1,4%	0,4%	0,006
Hold on	2,5%	2,2%	0,57
Sexual touch	0,7%	1,4%	0,041
Rape	0,1%	0,1%	1,00[a]
Stalking	2,0%	2,5%	0,36
Others	0,9%	2,2%	0,001
None	63,5%	62,5%	0,56

[a] Calculated using two-sided Fisher's exact test

Table 5. Types of patient aggression experienced by physicians providing inpatient and outpatient care during the preceding 12 months (N = 3,726)

Type of aggression	Inside hospital (*n*=1639)	Outside hospital (*n*=2087)	*p*-value
Total	38,3%	35,7%	0,11
Physical aggression	16,5%	12,8%	0,002
Mild physical aggression (such as pushing, gripping, spitting)	14,0%	7,3%	<0,0001
Heavy physical aggression (such as biting, kicking, hitting, strangulation)	6,0%	2,0%	<0,0001
Attack with object, weapon and / or animal	1,6%	1,8%	0,69
Damage to property and / or theft	6,7%	7,7%	0,23
Verbal aggression	35,8%	31,0%	0,002
Threat with physical aggression	19,5%	12,3%	<0,0001
Scold and / or insult	34,5%	29,6%	0,001
Psychological aggression	30,1%	29,9%	0,88
Humiliation	10,9%	10,4%	0,64
Blaming and / or intentional guilt delivery	25,6%	24,2%	0,32
Threat with suicide and / or automutilation	13,3%	11,9%	0,19
Manipulation and / or incitement to illegal things	11,4%	17,7%	<0,0001
Chantage	8,7%	8,6%	0,87
Load and / or reproach	11,8%	10,1%	0,11
Sexual aggression	8,3%	10,4%	0,030
Sexual remarks	7,1%	8,3%	0,17
Sexual acts by themselves	0,6%	1,4%	0,020
Hold on	2,3%	2,4%	0,71
Sexual touch	0,6%	1,1%	0,09
Rape	0,0%	0,2%	0,14[a]
Stalking	1,9%	2,4%	0,30
Others	0,9%	1,7%	0,035
None	61,7%	64,3%	0,11

[a] Calculated using two-sided Fisher's exact test

Table 6. Logistic regression for aggression type

Variables	Sig.	OR	95% CI for OR
Aggression during the career			
Gender	0.007	0.679	0.512 – 0.901
Age	0.008	1.168	1.041 – 1.311
Number of collaborators	0.024	1.212	1.025 – 1.432
Aggression during the past 12 months			
Language	0.016	1.326	1.054 – 1.669
Gender	0.001	0.695	0.556 – 0.868
Years of experience	<0.001	0.775	0.702 – 0.855
Hospital department	0.001	1.012	1.005 – 1.019
Number of collaborators	0.003	1.250	1.081 – 1.446
Physical aggression during past 12 months			
Language	0.005	1.535	1.136 – 2.075
Age	<0.001	1.291	1.128 – 1.478
Hospital department	<0.001	1.020	1.010 – 1.030
Number of collaborators	0.004	1.350	1.099 – 1.659
Verbal aggression during past 12 months			
Gender	0.010	0.744	0.594 – 0.933
Years of experience	<0.001	0.781	0.706 – 0.863
Hospital department	0.001	1.012	1.005 – 1.020
Number of collaborators	0.011	1.211	1.045 – 1.404
Psychological aggression during past 12 months			
Language	<0.001	1.595	1.249 – 2.035
Gender	<0.001	0.647	0.509 – 0.822
Years of experience	<0.001	0.785	0.705 – 0.874
Hospital department	<0.001	1.014	1.006 – 1.022
Number of collaborators	0.001	1.311	1.119 – 1.535
Sexual aggression during past 12 months			
Gender	0.001	0.472	0.307 – 0.725
Years of experience	0.004	0.737	0.600 – 0.906
Hospital department	0.002	1.022	1.008 – 1.038

FIGURE LEGENDS

Figure 1. Patient aggression experienced by physicians during the preceding 12 months, by year of physician birth

Figure 2. Patient aggression experienced by physicians during the preceding 12 months, by number of years in practice

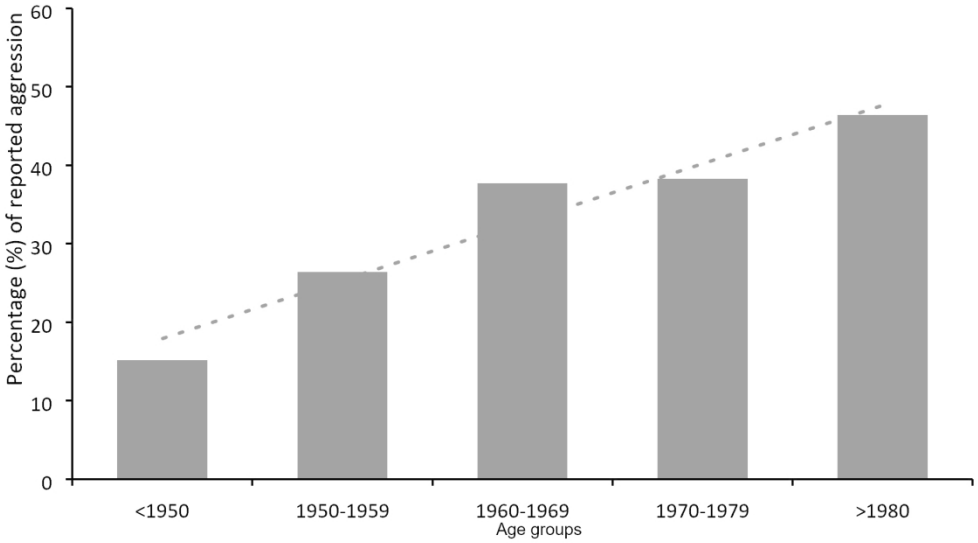

Figure 1. Patient aggression experienced by physicians during the preceding 12 months, by year of physician birth

169x97mm (300 x 300 DPI)

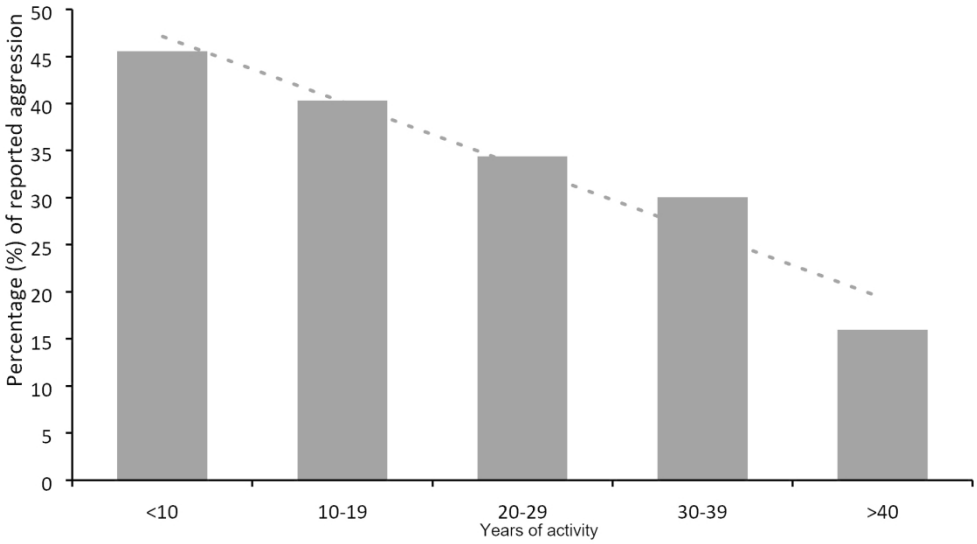

Figure 2. Patient aggression experienced by physicians during the preceding 12 months, by number of years in practice

169x97mm (300 x 300 DPI)

QUESTIONNAIRE TRANSLATED INTO ENGLISH
(The questionnaire is not subject to copyright)

Part 1: Prevalence

1. Which types of aggression or violence have you experienced during your career, situated within the doctor-patient relationship? (Multiple answers possible)
   - Physical
   - Verbal
   - Psychic
   - Sexual
   - Other
   - None

2. How often in the past 12 months have you been a victim of aggression or violence within the doctor-patient relationship? Also specify whether this was in your consultation room, outside your consultation room or during emergency service.

	Type	**In the consultation room**	**Outside the consultation room**	**During emergency service**
Physical	Slight physical violence (such as pushing, grabbing, spitting)			
	Heavy physical violence (such as biting, kicking, hitting, strangulation)			
	Attack with object, weapon and / or animal			
	Damage to property and / or theft			
Verbal	Threat with physical violence			
	Swearing and / or insulting			
Psychic	Humiliation			
	Blame and / or deliberately make you feel guilty			
	Threat with suicide and / or automutilation			
	Manipulation and / or incitement to illegal things			
	Blackmail			
	Slander and / or defamation			
Sexual	Sexual comments			

	Sexual acts on oneself			
	Embrace you			
	Touch you sexually			
	Rape			
	Stalking			
Others	Others			

Part 2: Choose the case from the last 12 months that you experienced as the worst (skip if no answer to question 2)

3. Which type of violence (or attempt) was applied? (Multiple answers possible)

    A. Physical
        - Slight physical violence (such as pushing, grabbing, spitting)
        - Heavy physical violence (such as biting, kicking, hitting, strangulation)
        - Attack with object, weapon and / or animal
        - Damage to property and / or theft

    B. Verbal
        - Threat with physical violence
        - Swearing and / or insulting

    C. Psychic
        - Humiliate
        - Blame and / or deliberately make you feel guilty
        - Threat with suicide and / or automutilation
        - Manipulation and / or incitement to illegal things
        - Blackmail
        - Slander and / or defamation

    D. Sexual
        i. Sexual comments
        ii. Sexual acts on oneself
        iii. Embrace you
        iv. Touch you sexually
        v. Rape
        vi. Stalking

    E. Others (Specify): . . . . . .

4. Zip code of the place where the aggression happened: . . . .

5. Moment of the aggression:
    A. Date: . . / . . / . . . .
    B. Time: . . : . .

6. In which setting did the aggression happen?
    A. In the consultation room
    B. On home visits
    C. In a nursing home
    D. On the street
    E. In an urgent treatment centre
    F. In a general hospital (specify the department):
        - Abdominal surgery
        - General surgery
        - Anatomo-Pathology
        - Anesthesiology
        - Pharmacy
        - Breast clinic
        - Cardiology
        - Dermatology
        - Diabetes clinic
        - Digestive surgery
        - Endocrinology
        - Physical medicine and rehabilitation
        - Geriatrics
        - Gynecology
        - Heart surgery
        - Hematology
        - Hemato-oncology
        - Immuno-allergology
        - Infectious diseases
        - Intensive care
        - Internal medicine
        - Throat, nose, ear
        - Physiotherapy
        - Clinical biology
        - Stomach and intestinal diseases
        - Medical Genetics
        - Mouth, jaw and facial surgery
        - Neonatology
        - Neurosurgery
        - Neurology
        - Kidney diseases
        - Nuclear Medicine
        - Obesity clinic
        - Oncology
        - One Day Clinic
        - Ophthalmology
        - Orthopedics - Traumatology
        - Pediatrics
        - Plastic surgery
        - Pneumology
        - Psychiatry
        - Radiology
        - Radiotherapy
        - Reproductive Medicine

- Rheumatology
- Sleep laboratory
- Emergency service
- Supportive and palliative care
- Thoracic surgery
- Urology
- Vascular surgery
- Obstetrics and prenatal medicine
- Other (specify): . . . . . .

G. In a psychiatric hospital
H. In a emergency service
I. In the surroundings of your residence
J. During a control for the employer
K. In a community childcare centre
L. In a health insurance company
M. In a prison
N. By telephone
O. By e-mail
P. By letter
Q. By Sms, WhatsApp, ...
R. On social media
S. Other (specify): . . .

7. Who caused the aggression? (if several aggressors, choose the most important aggressor)
   A. Known patient
   B. Unknown patient
   C. Patient's family
   D. A third person
   E. Anonymous or unknown aggressor

8. What was the aggressor's gender?
   A. Man
   B. Woman
   C. Unknown

9. What was the aggressor's age category?
   A. 0-19
   B. 20-39
   C. 40-59
   D. 60-79
   E. >80
   F. Unknown

10. What was the aggressor's living situation?
    A. Living alone
    B. Cohabiting
    C. Unknown

11. Is the aggressor known with (multiple answers possible):
    A. Psychiatric disease
    B. Ethylism
    C. Drugabuse
    D. Toxicomania
    E. Criminal past
    F. Violence against health care providers
    G. Chronic pain
    H. None of the above
    I. Unknown

12. What was the reason for aggression? (multiple answers possible)
    A. Refused prescriptons
    B. Disability certificate
    C. Other certificate
    D. Money and / or fees
    E. Theft of money and / or goods
    F. Your attitude
    G. Your medical approach
    H. Organization (for example waiting times)
    I. Miscommunication
    J. Expression of illness (organic or psychiatric)
    K. Other (specify): . . . . . .
    L. Unknown

13. What was your immediate response? (Multiple answers possible)

    A. Verbal response (urge the person to calm down, asking person to stop, go in defence)
    B. Physically defend yourself
    C. Indulging in patient requirements
    D. To scold
    E. To fight
    F. To escape
    G. To alarm (such as calling a colleague, calling the police)
    H. Other (specify): . . . . . .
    I. No immediate response

14. What was the late consequence? (Multiple answers possible)
    A. Physical injuries
    B. Material damage
    C. Psychological problems
    D. Change of attitude
    E. Influence on working method
    F. Fear and / or feeling of insecurity
    G. Impairment of your personal integrity
    H. Incapacity for work during … days
    I. Other (specify): . . . . . .
    J. No consequences

15. Have you reported to one of the following authorities? (Multiple answers possible)
    A. Police
    B. Family doctor's association
    C. Reporting point for aggression of the National Medical Council
    D. Other (specify): . . . . . .
    E. None

16. What was the consequence for the aggressor? (Multiple answers possible)
    A. Warning
    B. Arrest
    C. Persecution
    D. Deleted from patient list of the practice / hospital
    E. Referred to a colleague
    F. Has apologized
    G. None
    H. Other (specify): . . . . . .

17. Do you think this incident could have been prevented?
    A. Yes (specify):. . . . . .
    B. No.
    C. Don't know

Part 3: Preventive measures

18. Have you invested in resources to defend yourself? (multiple answers possible)
    A. Weapons, if yes specify which:. . . . . .
    B. Dog
    C. Spray cans (such as pepper spray)
    D. Escort by other person (such as student, police, army, private company, driver)
    E. Electronic tracking systems (such as GPS)
    F. Callback system (in case of confinement at the patient's home)
    G. Self-defense courses
    H. Courses on conflict management
    I. Other (specify): . . . . . .
    J. None of the above

19. Have you already taken preventive measures to protect your working environment? (multiple answers possible)
    A. Camera surveillance
    B. Secure cash register and / or payment terminal
    C. Alarm systems
    D. Alarm button on mobile phone or desk
    E. List of risk patients (personal, in group practice, in medical record)
    F. Urgent treatment centre
    G. Secretariat
    H. Other (specify): . . . . . .
    I. None of the above

20. Have all the violence incidents of the past 12 months together led to the following problems for you? (multiple answers possible) (skip if no answer to question 2)

A. Fear
B. Burnout
C. Stress
D. Depression
E. Sleep disorders
F. Low self-confidence
G. Suicidal thoughts
H. Feeling insecure
I. Changing practice
J. Stopping your practice
K. Hindrance to good medical care
L. Other (specify): . . . . . .
M. No complaints

21. Do you know the national reporting point for aggression against doctors, established in May 2016 by the National Medical Council?

A. Yes
B. No.

Part 4: General personal data

22. Gender

G. Male
H. Female

23. Year of birth: . . . .

24. Number of years of practice:. . . years

25. What is your main activity?

A. Solo practice
B. Duo practice
C. Group practice
D. Community Health Center
E. Hospital
   - Abdominal surgery
   - General surgery
   - Anatomo-Pathology
   - Anesthesiology
   - Pharmacy
   - Breast clinic
   - Cardiology
   - Dermatology
   - Diabetes clinic
   - Digestive surgery
   - Endocrinology

- Physical medicine and rehabilitation
- Geriatrics
- Gynecology
- Heart surgery
- Hematology
- Hemato-oncology
- Immuno-allergology
- Infectious diseases
- Intensive care
- Internal medicine
- Throat, nose, ear
- Physiotherapy
- Clinical biology
- Stomach and intestinal diseases
- Medical Genetics
- Mouth, jaw and facial surgery
- Neonatology
- Neurosurgery
- Neurology
- Kidney diseases
- Nuclear Medicine
- Obesity clinic
- Oncology
- One Day Clinic
- Ophthalmology
- Orthopedics - Traumatology
- Pediatrics
- Plastic surgery
- Pneumology
- Psychiatry
- Radiology
- Radiotherapy
- Reproductive Medicine
- Rheumatology
- Sleep laboratory
- Emergency service
- Supportive and palliative care
- Thoracic surgery
- Urology
- Vascular surgery
- Obstetrics and prenatal medicine
- Other (specify): . . . . . .

F. Psychiatric institution
G. Nursing
H. Health insurance company
I. Control doctor of the employer
J. Community childcare centre
K. Prison
L. Other (specify): . . . . . .

26. Do you have collaborators in your practice (including assisting family members)?0

a. 1-5
b. >5

Part 5: Opinion poll (Optional) (answers with yes / no / no answer)

26. Should preventive escort by the police in the event of a risk call be possible?

27. Do you think there is a need for proactive reporting of risk patients among physicians?

28. Do you think there is a need for proactive reporting of risk patients by the police?

29. Should professional secrecy be shared between doctors in the interest of your safety?

30. Should professional secrecy be shared with the police in the interest of your safety?

31. Should there be a red flag in the medical record?

32. Should lists of risk patients be available for the urgent treatment centers?

33. Do you think there is a need for an awareness campaign for the population?

34. Should there be zero tolerance towards aggression against care providers (such as in England and the Netherlands)?

35. Do you need a training to deal with aggression?

36. Should there be victim support by colleagues?

37. Is there a need for a self-help group for doctors?

38. Do you believe that the level of insecurity is now so high that physicians should consider no longer making night visits?

- If yes, which alternative do you propose to help patient at night? (specify): . . . . . .

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	4
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	6-8
Objectives	3	State specific objectives, including any prespecified hypotheses	8
Methods			
Study design	4	Present key elements of study design early in the paper	9-10
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	8-10
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	9-10
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	8-9
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	8-10
Bias	9	Describe any efforts to address potential sources of bias	9
Study size	10	Explain how the study size was arrived at	9
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	10-11
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	10-11
		(*b*) Describe any methods used to examine subgroups and interactions	10-11
		(*c*) Explain how missing data were addressed	10-11
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	10-11
		(*e*) Describe any sensitivity analyses	10-11
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	11
		(b) Give reasons for non-participation at each stage	11
		(c) Consider use of a flow diagram	11
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	11-12 Tabl 1
		(b) Indicate number of participants with missing data for each variable of interest	11
Outcome data	15*	Report numbers of outcome events or summary measures	11-16
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear	11-16

		which confounders were adjusted for and why they were included	
		(*b*) Report category boundaries when continuous variables were categorized	11-16
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	11-16
Discussion			
Key results	18	Summarise key results with reference to study objectives	16-17
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	20-21
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	21-22
Generalisability	21	Discuss the generalisability (external validity) of the study results	19
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	NA

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.