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# Measuring the patient safety climate in community pharmacies: an updated national survey

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## ABSTRACT

**Background** The patient safety climate in community pharmacies was measured nationally in Sweden in 2008. Since that time the Swedish pharmacy market has undergone a re-regulation which probably has affected the patient safety climate in pharmacies.

**Objectives** The aim was to evaluate the patient safety climate among pharmacists working in Swedish community pharmacies and compare it with historical data.

**Design** The patient safety climate among pharmacists was analysed in two cross-sectional surveys. Historical data from 2008 and data collected in 2022 were compared. The Safety Attitudes Questionnaire (SAQ), containing items on safety culture arranged in six dimensions, was used in both surveys. It uses a 5-point Likert scale to create a quantitative description of the respondents' perception of patient safety climate.

**Setting** Community pharmacies in Sweden.

**Participants** These surveys were census studies because all pharmacists working in community pharmacies in Sweden were invited to participate and no sampling occurred.

**Results** The number of respondents was 2738 in 2008 and 1931 in 2022. The patient safety climate in Swedish community pharmacies appears to have worsened between 2008 and 2022 according to the pharmacists. All values of the dimensions included in the SAQ have decreased, except for the dimension of Stress Recognition, where an increase indicated a larger awareness among the pharmacists of how stress impacts their work. The overall negative trend in SAQ values seen between 2008 and 2022 was consistent, irrespective of the respondent's level of education, their role in the pharmacy or the number of years since their education was completed.

**Conclusions** The patient safety climate in community pharmacies in Sweden seems to have deteriorated. With an increasingly strained healthcare system, community pharmacists must be reliable defenders of patient safety, and it is essential to ensure that the climate in their workplace supports the important work being carried out.

## STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ A key strength of this study is that data from two national surveys measuring patient safety climate in community pharmacies, conducted nearly 15 years apart, are used.
⇒ Another strength is that both surveys are census studies, thus eliminating sampling bias.
⇒ A limitation is that the data collection in 2022 coincided with the latter stages of the COVID-19 pandemic, potentially influencing the responses.

## INTRODUCTION

Patient safety is fundamental in healthcare. According to a meta-analysis, about 1 in 30 patients in medical care suffers from preventable medication harm, and more than 25% of these cases are severe or life-threatening.[1]

An important aspect of patient safety is ensuring that patients receive safe and effective medication. Patient safety is paramount in community pharmacies, and measures to prevent patients from being harmed due to dispensing errors are important.[2 3]

The easily accessible community pharmacies play an increasingly important role in alleviating a strained healthcare system, and this was particularly evident during the COVID-19 pandemic.[4] One of the lessons learnt was that maintaining patient safety became more challenging due to increased workloads in community pharmacies.[5–7] To ensure patient safety, pharmacies should have standards for all procedures,[8 9] and transparency should be employed to facilitate a culture where errors are identified, investigated and prevented.[10 11] The patient safety climate in community pharmacies is also shaped by how the pharmacists perceive the level of demands and the resources to fulfil these demands.[12]

Research regarding patient safety climate and culture has previously focused on inpatient settings,[13] and studies in hospitals have demonstrated that a more positive patient safety culture is associated with fewer adverse events and readmissions.[14 15] In recent decades, as research has extended into community pharmacies, there has been an increase in studies measuring patient safety climate in these settings. The Safety Attitudes Questionnaire (SAQ) Community Pharmacy

version is one quantitative questionnaire tool, specifically adapted for use in community pharmacies. It measures six dimensions of the patient safety climate: Teamwork Climate, Safety Climate, Job Satisfaction, Stress Recognition, Perception of Management and Working Conditions.[16] Staff questionnaires such as the SAQ are useful tools for understanding the level of patient safety climate in community pharmacy practice.[13 17 18]

The SAQ was used in a study of community pharmacies in Canada and showed a positive view of the patient safety climate.[19] Staffing levels as well as training and supervision of new pharmacy personal could, however, be improved.[19] In Malaysia, the SAQ survey was distributed among pharmacists in hospitals and health clinics, and analysis on the individual level showed that self-reported medication errors were positively related to higher scores in the dimension of Stress Recognition.[20] Higher scores for the other dimensions were also associated with fewer numbers of self-reported medication errors.[20] In parallel, a previous study of safety climate in community pharmacies in several European countries found that one of the dimensions, 'working conditions', had a strong relationship with the overall perception of safety.[21] This suggests that work environment factors may play a significant role in how safety is perceived and can potentially be extrapolated to perceptions of patient safety climate. For example, a higher dispensing volume and perceived overload among community pharmacists were also associated with reported dispensing errors.[22]

Similar results were found in a Swedish survey using the SAQ in 2008[23] where a significant relationship between the dimension of Stress Recognition and dispensing errors at the pharmacy level was found.[24] Since that study was carried out, the Swedish pharmacy market has undergone major changes (see online supplemental appendix S1), the most predominant of which was the re-regulation of the market in 2009. Transforming community pharmacies into more prominent for-profit organisations can affect patient safety[25] and, therefore, it is important to repeatedly measure the safety climate in pharmacies.

### Aim

The aim of this study was to evaluate the patient safety climate among pharmacists working in Swedish community pharmacies and to compare this with historical data.

## MATERIALS AND METHOD

The patient safety climate among pharmacists was analysed in two cross-sectional surveys using SAQ.[16] Historical data from 2008[23] and data collected in 2022 were compared, using SPSS (IBM Corp. Released 2023. IBM SPSS Statistics for Windows, V.29.0.2.0, IBM Corp).

Both surveys were census studies, as all pharmacists working in Swedish community pharmacies at the time periods were invited to participate. This means that no sampling had taken place in any of the surveys. Because all individuals from the population were invited to participate in both cross-sectional surveys, there was no need for inferential statistics analysis.[26] Inferential statistics are based on taking a random sample of a population and trying to conclude a larger population.[27] Inferential statistics analysis is hence not applicable for censuses, due to the absence of sampling variability, unless reference is made to wider target populations to which the results might be generalised.[26] In other words, in a census, all results are inherently significant as they represent the actual state or change in the entire population.

### Participants

#### Study group of 2008

In 2008, the National Corporation of Swedish Pharmacies owned all community pharmacies in Sweden, and all the approximately 7000 employees, including non-pharmacists, were invited to participate.[23] For the current analysis, only pharmacists were included, and responses from non-pharmacists were deleted from the dataset.

#### Study group of 2022

All pharmacists working in community pharmacies in Sweden according to the Swedish Occupational Register were invited to participate.[28] The register has a 2-year delay in recording data, meaning that the pharmacists employed at community pharmacies after 2019 could not be identified at the time of the study.

#### Differences and similarities in the study groups

The pharmacies in the study group of 2008 all belonged to the National Corporation of Swedish Pharmacies, and thus were similar in the range of services provided. In 2022, there were five major pharmacy chains and around 40 individually operated pharmacies. Despite this diversified ownership, the similarities between pharmacies are still present.[29] In Sweden, almost all community pharmacies are corporate, and all are for-profit with similar services provided. The study population in both 2008 and 2022 consisted of all pharmacists employed in community pharmacies in Sweden, but individuals were not necessarily the same in the two groups.

In Sweden, there are two pharmaceutical educations, namely pharmacists with a 5-year university education and prescriptionists with a 3-year university education. Both categories have medication dispensing certifications, corresponding to that of an international pharmacist degree. When using the term pharmacist, both categories are included if not otherwise specified.

### The questionnaire

The SAQ[16] was used in both study groups, using the Swedish Community Pharmacy version that had been previously translated and validated for the target group, Swedish community pharmacists.[23] The questionnaire is composed of six defined dimensions and 36 items (see online supplemental appendix S2). The respondents use a 5-point Likert scale to rate their perception of safety within their workplace.

Questions regarding respondent characteristics such as education (pharmacists or prescriptionists) and role in the pharmacy (ie, pharmacy manager, pharmacist responsible for quality assurance or pharmacist without special responsibilities) were included. Questions on gender and age were included in the questionnaire in 2008, while such data were obtained from the registry in 2022. At the end of the survey, the respondents were asked questions about the working conditions and perceived patient safety in community pharmacies during the COVID-19 pandemic, and the findings from those questions have been published.[30]

## Data collection

### Study group of 2008

The web-based questionnaire was distributed in the beginning of 2008, using the internal web-based mail system of the National Corporation of Pharmacies. Actions were taken to increase the response rate, such as web-based reminders and reminders via the trade unions. Data were collected from January to March 2008.[23]

### Study group of 2022

An invitation letter was sent in November 2021 to the digital public authority mailbox or the home address if such a mailbox was lacking.[30] The letter included a link to the electronic questionnaire. Three reminders (digital and postal) were sent. Data were collected for 13 weeks until February 2022.[30]

### Inclusion criteria

In the study group of 2008, only licensed pharmacists working in community pharmacies were included in this study (hence data from other staff were excluded). Distribution of the questionnaire via the internal e-mail function ensured that all were invited to participate in the study.

In 2022, the selection questions 'Are you a licensed pharmacist?' and 'Do you work in a pharmacy?' were used to ensure that only the intended respondents participated in the survey.

In both study groups, each respondent received an individual invitation to the survey and could save previous answers and return later but could only submit the questionnaire once.

## Data analysis

The analysis of both datasets was carried out in accordance with the instructions from the creators of the questionnaire.[31] The answers were scored 1–5 with 1 as 'disagree strongly', and negatively worded items (see online supplemental appendix S2) were reversely scored as 5–1 where 5 was 'disagree strongly'. For each dimension, a mean score was calculated for each respondent and converted to a 100-point scale, where 1=0 and 5=100. A score of 75 or above was considered positive, and 75 was thus equivalent to 'agree slightly' on the 5-point Likert scale. The percentage of respondents being positive was then the per cent of respondents with a score of 75 or higher. For the purposes of this study, the percentage of positive respondents was used, as recommended.[31]

## Patient and public involvement

None.

# RESULTS

The number of presumptive respondents in the study group of 2008 was estimated to be 4077 as 61% out of 6683 pharmacy employees were pharmacists.[23] The number of respondents was 2815, giving an estimated response rate of 69%. An additional 77 respondents had not stated their role in the pharmacy (or had non-relevant roles in the pharmacy) and were excluded, resulting in 2738 respondents used in the analyses.

In 2022, the register included 5364 presumptive respondents but 83 were found to be deceased, emigrated, or for other reasons not eligible, resulting in 5281 presumptive respondents. Out of these, 378 were not working in community pharmacies when they received the questionnaire. This resulted in 4903 eligible respondents, and 2034 of these returned their questionnaire, giving a response rate of 41%. An additional 103 respondents had not provided essential information about their education or their role in the pharmacy (or had non-relevant roles in the pharmacy) and were excluded from the analyses, resulting in 1931 respondents—for details, see online supplemental appendix S3. Characteristics of the respondents are presented in table 1.

In 2008 and 2022, the proportions of women in the respondent groups were 95% (n=2591) and 89% (n=1722), respectively. In the total population of possible

**Table 1** Characteristics of the respondents in the study group of 2008 (n=2738) and in the study group of 2022 (n=1931)

| | Study group of 2008; % | | Study group of 2022; % | |
|---|---|---|---|---|
| Education | | | | |
| Pharmacist | 12 | (n=333) | 31 | (n=596) |
| Prescriptionist | 88 | (n=2405) | 69 | (n=1335) |
| Professional role | | | | |
| Pharmacy manager | 5 | (n=146) | 7 | (n=126) |
| Pharmacist responsible for quality | 21 | (n=562) | 22 | (n=430) |
| Pharmacist without special responsibilities | 74 | (n=2030) | 71 | (n=1375) |
| Time in pharmacy | | | | |
| Fewer than 5 years | 15 | (n=408) | 11 | (n=208) |
| More than 5 years | 85 | (n=2310) | 89 | (n=1723) |
| Missing* | 1 | (n=20) | 0 | |

*Missing is not presented for education or professional role because these categories are inclusion categories.

Table 2 Percentage of positive respondents to the Safety Attitudes Questionnaire dimensions in the study groups of 2008 and 2022

| | 2008 | | 2022 | | Difference |
|---|---|---|---|---|---|
| | % positive (n=2698) | Missing (n) | % positive (n=1931) | Missing (n) | % |
| Teamwork | 81.2 | 40 | 71.8 | 1 | 9.4 |
| Safety Climate | 75.3 | 14 | 68.2 | 2 | 7.1 |
| Job Satisfaction | 78.9 | 11 | 62.1 | 0 | 16.8 |
| Stress Recognition | 67.6 | 19 | 73.0 | 2 | –5.4 |
| Perceptions of Management | 68.3 | 49 | 53.7 | 1 | 14.6 |
| Working Conditions | 53.3 | 13 | 37.3 | 1 | 16 |

eligible respondents, the corresponding proportions of women were 96% and 86%.

The overall proportion of positive respondents in the dimensions decreased from 2008 to 2021, except for the dimension of Stress Recognition, which increased (from 67.6% to 73.0%), see table 2. Both dimensions of Job Satisfaction and Working Conditions decreased by more than 15 units (from 78.9% to 62.1% and from 53.3% to 37.3%, respectively), while the dimension of Perceptions of Management decreased by almost 15 units (from 68.3% to 53.7%).

Generally, pharmacists had a lower percentage of positive responses than prescriptionists in both surveys (table 3). The main difference between 2008 and 2022 for both professions was the overall decrease in positive responses, except for the dimension of Stress Recognition, where an increase was noted.

Overall, in both surveys pharmacy managers rated all dimensions more positively than the other staff categories with the one exception of Stress Recognition (table 4). Pharmacy managers demonstrated the lowest scores compared with the rest of the staff in Stress Recognition. The managers showed a general decrease in positive responses between 2008 and 2022, but to a lesser degree than pharmacists with quality assurance responsibilities.

The pharmacists with quality assurance responsibilities showed larger decreases between 2008 and 2022 in most dimensions compared with other staff. The decrease was especially notable in the dimensions of Job Satisfaction, Perception of Management and Working Conditions, with decreases exceeding 24 units.

The largest group, pharmacists without specific roles, showed the smallest differences between 2008 and 2022, but at the same time they had the lowest scores of all staff categories in 2022.

In both surveys, regardless of whether the respondents had finished their education less than five or more than 5 years ago, mostly only minor differences were seen between the groups (table 5). The biggest differences between 2008 and 2022, however, were seen in the group of respondents who finished their education less than 5 years ago. Among these, fewer respondents had positive responses in all dimensions in 2022 compared with 2008.

Table 3 Percentage positive respondents to the Safety Attitudes Questionnaire dimensions in the study groups of 2008 and 2022 by education

| | Pharmacists | | Prescriptionists | |
|---|---|---|---|---|
| | 2008 | 2022 | 2008 | 2022 |
| | % positive (n=333) | % positive (n=596) | % positive (n=2417) | % positive (n=1335) |
| Teamwork | 77.1 | 67.7 | 81.7 | 73.6 |
| Safety Climate | 70.5 | 66.8 | 76.0 | 68.8 |
| Job Satisfaction | 69.7 | 55.9 | 80.2 | 64.9 |
| Stress Recognition | 67.0 | 71.8 | 67.7 | 73.6 |
| Perceptions of Management | 68.2 | 50.3 | 68.3 | 55.2 |
| Working Conditions | 58.9 | 37.6 | 52.6 | 37.1 |

Full table including missing values available in online supplemental material S4.

## DISCUSSION

When comparing the results of the SAQ from the two cross-sectional surveys in 2008 and 2022, the patient safety climate in Swedish community pharmacies appears to have worsened. All values of the dimensions included in the SAQ have decreased, except for Stress Recognition, where an increase indicates a greater awareness among the staff of how stress impacts their work. The overall negative trend in SAQ values seen between 2008 and 2022 remained consistent, irrespective of the respondent's level of education, their role in the pharmacy or the number of years since they completed their education.

The negative trend is consistent with findings in previous studies. In surveys carried out by The Swedish Agency for Public Management in 2011/2012 and 2012/2013, four items from the SAQ were used, including two items belonging to the dimension of Safety Climate, one belonging to the dimension of Teamwork Climate and one belonging to the dimension of Perceptions of Management. All four items demonstrated a significant

**Table 4** Percentage of positive respondents to the Safety Attitudes Questionnaire dimensions in the study groups of 2008 and 2022 by role in the pharmacy

| | Pharmacy managers | | Pharmacist responsible for quality assurance | | Pharmacist without specific role | |
|---|---|---|---|---|---|---|
| | 2008 % positive (n=146) | 2022 % positive (n=126) | 2008 % positive (n=562) | 2022 % positive (n=430) | 2008 % positive (n=2030) | 2022 % positive (n=1375) |
| Teamwork | 95.7 | 84.1 | 90.3 | 77.2 | 77.7 | 69.0 |
| Safety Climate | 97.2 | 84.1 | 90.3 | 75.8 | 69.6 | 64.4 |
| Job Satisfaction | 97.9 | 82.5 | 87.8 | 62.8 | 75.0 | 60.0 |
| Stress Recognition | 52.4 | 64.3 | 63.4 | 74.2 | 69.9 | 73.5 |
| Perceptions of Management | 91.0 | 75.4 | 77.4 | 53.3 | 64.5 | 51.9 |
| Working Conditions | 95.8 | 69.8 | 69.9 | 40.0 | 45.8 | 33.4 |

Full table including missing values available in online supplemental material S5.

decrease in the survey in 2011/2012 as compared with the results in 2008. In the second survey, a significant decrease was found in the two items representing Safety Climate, while the other two items showed no significant differences compared with 2008.[32]

No international studies with repeated national cross-sectional measurements of the safety climate using the same survey instrument in community pharmacies, or in healthcare in general, have been identified. It is therefore not possible to determine whether the observed decrease exists elsewhere or if these results are an isolated phenomenon in Swedish community pharmacies.

The level of education has an impact on the perception of the safety climate. Pharmacists in general showed lower SAQ scores than prescriptionists both in 2008 and 2022, indicating that pharmacists experience the patient safety climate as worse. There was a larger decrease in scores in the dimension of Job Satisfaction between 2008 and 2022 for pharmacists compared with prescriptionists. The score for pharmacists decreased to less than 60%, which is in the 'need for improvements' range.[23] A possible explanation is that a higher level of education provides more insight into the complexity of the work being carried out. This is supported by another study where a similar difference in patient safety climate was found comparing doctors and nurses. Doctors in general displayed lower patient safety climate scores than nurses.[33]

In this study, managers had a more positive view of the patient safety climate, and these findings are confirmed in other studies, also internationally and in other parts of healthcare.[33–35] Holding a more specialised position in the pharmacy such as pharmacy manager might entail a reduced inclination to admit weaknesses. The managers might be somewhat more loyal than other employees and may thus downplay patient safety issues. This might be even more likely if the company offers bonuses to managers.[36] While employee loyalty is believed to play a significant role in companies' success,[37] it is a balancing act and should not overshadow healthcare staff's responsibility to uphold patient safety. Another hypothesis is that individuals holding a positive perception of the pharmacy's safety climate may be more inclined to be offered a position as a pharmacy manager and be more willing to accept such positions.

**Table 5** Percentage of positive respondents to the Safety Attitudes Questionnaire dimensions in the study groups of 2008 and 2022 by years since finishing their education

| | Finished education less than 5 years ago | | Finished education 5 years ago or more | |
|---|---|---|---|---|
| | 2008 % positive (n=405) | 2022 % positive (n=208) | 2008 % positive (n=2324) | 2022 % positive (n=1723) |
| Teamwork | 81.5 | 64.4 | 81.2 | 72.7 |
| Safety Climate | 68.8 | 61.5 | 76.5 | 69.0 |
| Job Satisfaction | 78.9 | 53.8 | 78.9 | 63.1 |
| Stress Recognition | 71.9 | 69.2 | 66.9 | 73.5 |
| Perceptions of Management | 66.7 | 43.3 | 68.6 | 55.0 |
| Working Conditions | 49.9 | 30.8 | 54.0 | 38.0 |

Full table including missing values available in online supplemental materials S6.

The pharmacists responsible for quality assurance had a less positive view of the patient safety climate than pharmacy managers. This may be because they have a greater insight into patient safety than their managers. They report serious deviations occurring in the pharmacy to authorities, but lack adequate time to fulfil their responsibilities, and it is believed that serious deviations are underreported in Swedish community pharmacies.[38]

The pharmacists without special assignments, the largest group of pharmacists in both surveys, scored lowest on all dimensions compared with the other two staff categories. This might be because they are the closest to day-to-day operations and are more likely to see all the potential patient safety issues in the pharmacies. Frontline healthcare workers' perception of the safety climate has been reported to predict patient safety better than senior management in hospitals, suggesting that frontline workers have a truer perception of patient safety.[39]

There are too few pharmacists interested in working in Swedish community pharmacies, resulting in vacancies.[40] Companies are unable to open pharmacies to the desired extent and pharmacies are being closed due to lack of pharmacists, especially in remote areas.[40] Internationally, it has been shown that staff shortages in rural areas can make it even harder to recruit and retain pharmacists, due to lack of peer support and experiencing an unhealthy work–life balance, as it is hard to take leave.[41] Occupational safety and health surveys carried out by trade unions show shortcomings in working conditions[42 43] possibly affecting the willingness to work in pharmacies. In addition, this study showed that pharmacists with fewer than 5 years since finishing their education generally scored worse in all dimensions in 2022 compared with 2008, with the largest decrease in the dimension of Job Satisfaction. This suggests that the challenges to recruiting pharmacists to community pharmacies in Sweden may persist.

Even though the scores for all dimensions in this study decreased (except for Stress Recognition), the largest decrease was noted in the dimensions of Job Satisfaction, Working Conditions and Perception of Management. A recently published study in New Zealand regarding pharmacists' job satisfaction indicated similar results and showed that job satisfaction has not improved over the last two decades.[44] Increased workplace stress and bureaucratic burden in community pharmacies, a strained healthcare system, and an increased commercial focus are some of the explanations proposed to affect pharmacists' job satisfaction and threaten the perceived patient safety climate in community pharmacies internationally.[44–47] The patient safety climate has been found to correlate to the type of organisation, with larger chains receiving less favourable scores in the 'working conditions' category than independent pharmacies in the UK.[35] The development in Sweden, with the increased commercialisation of pharmacies since the reregulation, may also reflect this phenomenon. In this study, both the dimensions of Working Conditions and Perceptions of Management deteriorated substantially, which can have a negative impact on Job Satisfaction.[48] In data collected at the same time as the SAQ survey in 2022, community pharmacists in Sweden described their working conditions as having deteriorated during the COVID-19 pandemic,[30] which could have had a negative impact on Job Satisfaction as well as the other dimensions in this study. However, a majority of the pharmacists did not believe that patient safety was affected by the pandemic.[30]

Fewer than 60% of positive respondents in a dimension of the SAQ have been suggested to be in the 'need for improvements' range.[23] In 2022, scores below 60% were observed in several dimensions measured by the SAQ, indicating areas that could benefit from further study and from interventions for improvement. A possible process for implementing lasting improvements, and the conditions that need to exist to obtain an environment that accepts and allows continuous improvement work, has been suggested.[49] The benefits of introducing a standardised continuous quality improvement programme, improvements related to quality processes, risk management, staff competence and education have been demonstrated.[50]

## Strengths and limitations

The main strength of this study is that data from two national surveys, conducted close to 15 years apart, made it possible to study changes in the overall perception of the patient safety climate among pharmacists in community pharmacies. The fact that both surveys were census studies, that is, no sampling had occurred, is another strength.

One limitation is that the data collection in 2022 occurred during the latter stages of the COVID-19 pandemic. When the survey was distributed, it was initially believed that the pandemic had subsided; however, a final wave hit.

The age of the respondents was reported differently in the two studies, which is why information about the time since the pharmacists completed their education was used. The registry used in 2022 did not include pharmacists who had worked less than 2 years in community pharmacies due to a lag in reporting. Consequently, the proportion of respondents with less than 5 years since graduation was lower in 2022 than in 2008. Some data in the occupational register are submitted by the pharmacy companies themselves, which might influence the quality of the data. The occupational register is, however, the only available register of pharmacists working in community pharmacies in Sweden and is a part of the official statistics in Sweden.[28]

The internal missing data was larger in 2008 compared with 2022. In 2008, the survey was distributed via the company, and managers were encouraged to give employees time to respond, but this might have been a challenge. It might have been perceived as an order by the employees to respond, leading to internal missing data as a sign of protest. Also, questions about anonymity might have arisen due to this approach. The survey from 2022,

in contrast, was distributed directly to the pharmacists, giving the respondents the free choice to participate.

Reporting bias cannot be ruled out in this study, since there is a possibility that opinionated pharmacists have been more likely to respond or that pharmacists more time pressured have opted to not respond. This is however believed to be a limited problem, as there is a relatively high response rate in the study.

A limitation of this study is the lack of information about which pharmacies or companies the pharmacists worked for. However, despite the reregulation, community pharmacies in Sweden remain homogeneous in terms of services offered.[29] Pharmacy ownership characteristics, often reflect workplace norms, climate and culture.[51] In Sweden, nearly all pharmacies are corporate, and all are for-profit, which might explain this similarity. Because of this, and to counteract the respondent's fear of compromised anonymity, information on specific pharmacies was not collected.

## Recommendations for future research

The pharmacy managers are central in maintaining a healthy working environment and simultaneously upholding patient safety in community pharmacies. This study showed that pharmacy managers rate patient safety climate more positively than other pharmacists. How this translates to actual patient safety was not studied and would be an interesting field for further studies.

Future studies could collect more information on pharmacy characteristics. If this can be done while maintaining participant confidentiality, additional analyses of patient safety climate could be performed.

Because the patient safety climate in community pharmacies in Sweden appears to have decreased over the last decades, it is important to focus on how this trend can be broken. Effective interventions to improve the patient safety climate could be identified and evaluated. However, it is important to note that this study was carried out during the last phase of the COVID-19 pandemic, and a follow-up is needed to see if the results are consistent.

## Conclusions

Community pharmacies in Sweden face challenges, and this study shows a decline in pharmacists' perception of the patient safety climate in community pharmacies between 2008 and 2022. The greatest dissatisfaction was found in the dimensions of Job Satisfaction and Working Conditions. In general, pharmacy managers had a more positive view of the patient safety climate, while higher education was associated with lower scores. With an increasingly strained healthcare system, community pharmacists must be reliable defenders of patient safety, and it is fundamental that the climate in their workplace supports the important work they do.

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**Competing interests** BS is affiliated with Sveriges Farmaceuter, The Swedish Pharmacists Association, a professional organisation representing university graduates in pharmacy, while CLP serves as a board member of the same organisation. The organisation Sveriges Farmaceuter, however, played no part in either the research procedures or the manuscript preparation. All other authors declare no conflicts of interest.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication** Not applicable.

**Ethics approval** This study involves human participants. No ethical approval was required for the data collection of the study group in 2008 according to Swedish law effective at that time. The data were de-identified when originally analysed, and the research group retrieved the de-identified data. Ethical consent for the survey in 2022 was given by the Swedish Ethical Review Authority (ID: 2021-03582) in August 2021, and Statistics Sweden processed the personal data in accordance with relevant data protection legislation.[52] The respondents in both study groups were informed that the data would be used for scientific purposes and that answering the questionnaire was voluntary. Participants gave informed consent to participate in the study before taking part.

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**Data availability statement** Data are available on reasonable request. The data that support the findings of this study are available from the corresponding author on reasonable request.



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