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Can Open Culture and Support in the Work Environment Mitigate the Impact of Disciplinary Procedures on Medical Doctors? A Questionnaire among Medical Doctors in the Netherlands

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Anonymized for review.

ABSTRACT

Introduction

Disciplinary procedures have a negative impact on the professional functioning of medical doctors (hereafter: doctors). Nurturing an open culture and supporting doctors after adverse medical events may alleviate this impact. This study aims to gain insight whether open culture and support in during a disciplinary procedure relates to changes to the professional practice of doctors.

Methods

All doctors who received a warning or a reprimand from the Dutch Disciplinary Board between July 2012 and August 2016 were invited to partake in a 60-item questionnaire concerning open culture in the direct work environment, perceived support during the disciplinary procedure, and the impact of the procedure on professional functioning as reported by doctors themselves. The response rate was 43% (n=210).

Results

A majority of doctors perceive their work environment as a safe environment to talk about and report incidents (71.2% (totally) agreed). Respondents indicating they received support by a lawyer or legal representative and colleagues also felt supported (92.8% and 89.2%). The disciplinary procedure had impact on professional practice, such as discussing improvement measures with colleagues/managers (60.8%) and trying to avoid risky patients (43.1%). Legal support, support by a professional confidant and professional association were related to less perceived changes to professional practice. We did not find a significant relationship between open culture and perceived changes in professional practice.

Conclusion

Disciplined doctors in our study perceive their working environment as open. Those doctors that receive support from lawyers and/or legal representatives and colleagues also feel supported. Legal support helps to alleviate the perceived impact on doctors' professional practice. Adversarial legal proceedings can be harmful in their own right. Therefore, further research into what aspects of legal support are helpful can provide guidelines to provide the support doctors need.

Strengths and limitations of this study

- This study assesses whether doctors perceive their work environment as open and supportive and how this relates to changes to their professional practice after disciplinary procedures. As disciplinary procedures are aimed at quality improvement, this is a valuable addition to the existing body of research.
- The results are self-reported by the respondents.
- The response rate was moderate, which may have caused a non-response bias. Non-response analysis was not possible because no characteristics of the non-respondents are available, in part due to meticulous privacy regulations. Consequences of the moderate response rate could be that the study population is not representative to the entire group of doctors who received a disciplinary measure.
- The study population was not comparable to the Dutch population of doctors in terms of age and gender.

- Complaint and disciplinary procedures differ between jurisdictions, possibly influencing the severity of the perceived impact. Results should be generalized with caution, taking the specifics of Dutch disciplinary law in consideration when doing so.

INTRODUCTION

Legal procedures in healthcare, such as disciplinary, complaint or claim procedures, can have negative consequences for the health and professional functioning of the healthcare professional [1-4]. Disciplinary procedures following adverse medical events can be particularly harmful as adverse medical events are often traumatic experiences in their own right, earning doctors the (controversial) term 'second victim' [5-8].[1] One concern in particular is the occurrence of 'defensive medicine', a phenomenon that can be difficult to pin down [10] but is commonly described as a deviation from standard medical practice by ordering treatments, tests and procedures primarily to protect from the threat of (malpractice) liability [11, 12] or for similar external demands such as criticism, complaints or reputational damage rather than diagnosing or treating the patient [13, 14]. In an earlier study concerning the impact of disciplinary procedures on doctors' health and professional functioning, responding doctors mentioned several changes to professional practice, such as avoiding patients similar to the complainant (Laarman, Bouwman et al. 2019). Some of the reported changes are associated with defensive medicine. These findings suggest disciplinary procedures can be counterproductive to the primary aim of disciplinary law; improving the quality of professional practice (see Box 1: Information about the Dutch disciplinary system).

From the body of literature concerning 'second victims' we learn that nurturing a 'just' culture that supports doctors after adverse medical events can soften the impact of adverse medical events on doctors and lead to even more more disclosure and better quality of care [15]. A just culture is built on the premises that organisational context is an important factor in the occurrence of adverse medical events, that even competent and dedicated professionals make mistakes, and that adverse events medical events are investigated respectfully and without stigmatizing or punishing professionals [16-18]. A just culture allows openness – to patients, but also amongst colleagues – to play its pivotal role in both patient safety and the better resolution of adverse events. Plews-Ogan et al. use the term 'post-traumatic growth' as described by Tedeschi and Calhoun [19] to demonstrate how the support of healthcare professionals after adverse medical events can even help doctors to become better doctors. Peer support, talking to the patient, becoming an expert about the cause of the event, and learning from the event are all coping mechanisms that promote growth [20].

However, disciplinary procedures take place outside the work environment. Furthermore, complaints are individual and confidential, which means that supervisors and/or colleagues are not informed about the procedure unless the professional informs them himself. The stigmatic nature of disciplinary complaints possibly hinders doctors from seeking or receiving support. Secondly, a disciplinary complaint is not necessarily related to the occurrence of an adverse medical event. Therefore, we do not know whether a culture of support extends to support during disciplinary procedures, and whether this support is enough to mitigate the negative impact of disciplinary procedures on professional functioning. Gaining insight in these questions is important. Disciplinary procedures aim at quality improvement through correcting professionals' behaviour. Nurturing a culture that is open and supports doctors after adverse medical events potentially aids doctors' recovery and possibly facilitates learning from the event. The assumption is that supporting doctors prevents doctors from practicing defensively. As a disciplinary procedure is supposed to be a learning

[1] Some healthcare professionals and patient advocates object to use of the term 'second victim', because it 'connotes passivity or stigmatize(s) clinicians' and because it 'deemphasizes the experience of patients and families' (9. Wu, A.W., et al., *The impact of adverse events on clinicians: what's in a name?* Journal of patient safety, 2017.) The patient is and remains the first victim in the main sense of the word. However, as Wu *et al* argue the term has gained widespread use. As such, while respectful of the objections against the use of the term 'second victim', it is an easy way to refer to and join the existing body of literature.

experience, the study under hand inquires to what extent doctors in the Netherlands experience their working environment as open and supportive during disciplinary proceedings, and whether an open culture and perceived support relate to the occurrence of changes to professional practice resulting from the disciplinary procedure.

Box 1: Information about the Dutch disciplinary system

The Dutch disciplinary system as set down in the Individual Healthcare Professions Act (BIG) is aimed at correcting the professionals' behaviour, improving healthcare quality and learning. Patients and other parties with a direct interest (the Dutch Healthcare Inspectorate, employers, or, under certain conditions, colleagues) can file a complaint with the Medical Disciplinary Board. Even though the procedure places the professional conduct of individual doctors under scrutiny, the disciplinary procedures do not have the formal purpose of punishing doctors.

The BIG Act sets out two disciplinary standards. The first refers to individual healthcare in neglecting a patient's need for care, such as incorrectly informing the patient, incorrect or delayed diagnosis or failure to perform a treatment. The second disciplinary norm refers to the general interest embodied in proper pursuit of the profession. This includes administrative actions, dealing with colleagues or actions in the media. The conduct of healthcare professionals assessed under disciplinary standard (1) is measured against the professional standard. The professional standard is composed of the state of the art of medical practice, construed inter alia out of relevant guidelines, protocols, scientific publications and case law by the disciplinary boards [21, 22].

If a complaint is judged valid, doctors can be disciplined with (in order of gravity of the measure) a warning, a reprimand, a monetary fine, a conditional or definite suspension, withdrawal of the right to perform certain treatments or the right to re-register (in cases where a professional voluntarily resigns from a register), or removal from the register. Professionals receive a warning when behaviour was not entirely correct, but not reprehensible. Professionals who acted in breach with the professional standard but who are still fit for unconditional practice receive a reprimand. In practice, the line between a warning and a reprimand can be vague.

Although other countries such as Germany, the UK and the USA also have disciplinary systems where comparable measures can be imposed, there are also important differences. For instance, there are differences in definitions used (such as fitness to practice versus professional misconduct), the structures and levels of the bodies handling them, and the likelihood of a formal judgement after a complaint has been received can vary greatly [23, 24]. These differences in procedural characteristics have to be taken into account when comparing research outcomes.

AIM AND RESEARCH QUESTIONS

This study is part of a larger project started in 2016 to gain insight into the experiences of healthcare professionals with the impact from a disciplinary procedure, a disciplinary measure and the publishing of a disciplinary measure. In the original study we differentiated between doctors getting a complaint and a reprimand (see Box 1 for the difference between disciplinary measures). At the time, reprimands were publicly disclosed. Since April 2019, reprimands are only disclosed when the disciplinary judge considers disclosure necessary. Therefore, the distinction between complaints and reprimands was not maintained in the study under hand.

In our questionnaire we included questions related to open culture and perceived support during disciplinary procedures. This study aims to gain insight into the relationship between experienced

open culture and support and changes in professional practice after a disciplinary measure. Research questions were:

1) Two what extent do Dutch medical doctors who received a disciplinary measure perceive their work environment as an open culture?
2) To what extent do Dutch medical doctors who received a disciplinary measure experience support during a disciplinary procedure?
3) To what extent do Dutch medical doctor report changes in their professional practice after a disciplinary measure?
4) Is there a relationship between open culture, support and perceived changes in professional practice after a disciplinary measure?

METHODS

Study population and data collection

This study focused on all Dutch medical doctors who received a warning or reprimand from the Disciplinary Board during the period July 2012 to August 2016. Doctors were enrolled in the study through the disciplinary boards. All doctors with a reprimand or warning received a letter in September 2016 inviting them to fill in a questionnaire online. Two reminder letters were sent to maximize the response. Privacy was considered very important given the sensitivity of the subject, so in close consultation with the disciplinary boards and the Ministry of Health we took the following measures:

- All letters were sent by the disciplinary board; the doctors remained anonymous to the researchers.
- A privacy policy was drawn up describing the process. This privacy policy was sent with the letter requesting participation in the study.
- All letters were sent in a plain white envelope without sender address, and the word 'confidential' was printed on the envelope.
- For privacy reasons, no response records were kept, so the two reminder letters were sent to all professionals. In order to create a homogenous study population with comparable contextual factors such as education, all care professionals other than medical doctors were removed from the dataset.
- The disciplinary boards received no information about which doctors did and did not respond and neither did the researchers.

Questionnaire

The pre-structured questionnaire is based on insights from national and international literature [2, 3, 25, 26]. Besides general characteristics (respondent's characteristics and occupation), the questions relevant for this study concerned open culture, support and changes to professional practice.

Open culture

- Agreement with three statements about perceived open culture in the direct work environment was measured ranging from (1) ‘totally agree’ to ‘totally disagree (5). Statements were adapted from [27].

Support:

- Six questions about the extent of perceived support during the procedure from people in the work environment (colleagues, supervisor, lawyer or other legal representative, complaints officer, (professional) confidant, my professional association) measured on a 5-point scale: ‘much support’ (5), ‘a little support’ (4), ‘no support, but neither obstruction’ (3) ‘a little obstruction’ (2) ‘much obstruction’ (1)

Changes to professional practice:

- One question about the perceived influence of the disciplinary procedure with four answer categories: the procedure had no influence; the procedure had a mostly positive influence;

the procedure had both a positive as a negative influence and the procedure had a mostly negative influence.

- 11 statements about changes in their professional practice due to the disciplinary procedure based on a review of the literature [2-4].

To check the face validity of the questionnaire, we asked the members of advisory committees of medical professionals, Disciplinary Board members, the Patient Federation of the Netherlands and the Ministry of Health, Welfare and Sports to review the questionnaire (in writing). The questionnaire was adjusted based on their suggestions, and then sent to 10 healthcare professionals. As the original study involved BIG registered healthcare professionals in general, beside medical doctors, the questionnaire was sent to 4 healthcare psychologists, 4 medical doctors, 1 nurse, 1 physiotherapist registered under the BIG Act. They were asked if the questions were properly understandable and clearly formulated, whether the answer categories were correct, whether they thought any answer categories or questions were missing, whether it was easy to fill out and whether the questionnaire was logically structured. Their feedback was used to draw up the final version of the questionnaire.

Study population

The response rate was 43% (n=294). The questionnaires of the following classes of respondents, which may overlap, were removed from the data file:

- Respondents who indicated that they had not received a reprimand or warning (n = 37);
- Respondents who stated that the disciplinary process had not yet been completed (n = 5);
- Respondents who filled in less than half of the questions (n = 2);
- Respondents with an occupation other than medical doctor (n=84).

A total of 210 respondents remained in the data file.

Patient and public involvement

Patients were not directly involved. As described under 'Questionnaire' patients were represented during the assessment of the questionnaire.

Statistical analyses

Descriptive analyses were performed on the measured variables.

A scale (α=0.86) was constructed of the three items concerning open culture in the work environment (see table 2). . The support items did not fit into one scale. One scale was constructed of 10 items measuring changes in professional practice (α=0.82). Of the eleven items that were asked, one item did not fit into the scale. New variables, on open culture and changes in professional practice were created for the scales by summing the scores on the items and dividing them by the total number of items.

Univariate linear regression analysis was performed on the independent variables (scale on open culture in work environment, six support items) and the dependent variable (scale created on changes in professional practice). We considered differences to be significant where they had a p-value of <0.05.

Questions that were answered as 'not applicable' were coded as missing. Missing values were left out.

Ethical considerations

This study was based on questionnaires completed by doctors; no patients were involved. As all the research participants were competent individuals and no participants were subjected to any interventions or actions, no ethical approval was needed under national law on medical research (Medical Research Involving Human Subjects Act, http://www.ccmo.nl). Participation in the study

was voluntary. The questionnaire data was stored and analysed anonymously, in accordance with the Dutch Personal Data Protection Act (http://www.privacy.nl/uploads/guide_for_controller_ministry_justice.pdf).

RESULTS

General characteristics of the study population and complaints process

Males (78.7%) and the over-50 age groups (together 75.2%, Table 1) are somewhat overrepresented in our study population. In the total Dutch population of doctors in 2015, 49.4% were male, and 6.2%[2] were older than 65 [28]. In our study population, 38.4% were general practitioners, 48.2% medical specialists, 13.4% other. For more than one third of the respondents, more than 2 years had gone by since they received their warning or reprimand (not in table). Of all respondents, 78.6% were given a warning and 21.4% a reprimand.

Table 1: Characteristics of the study population (n=207-210)

	Total (%)
Age	
39 or younger	5.2
40-49	19.5
50-59	38.1%
60 or older	37.1
Male	78.7
Female	21.3

Open culture

Doctors experience their work environment as open in the sense that they feel it is safe to talk about adverse events and report adverse events (71.2%), whereas 9,2 % disagree.

Table 2: Indicate your agreement with the following statements (N=206-210)

	(Totally) agree (%)	Neutral (%)	(Totally) disagree (%)
In my work environment, it was safe to address unsafe behaviour	63.6	27.2	9.2
In my work environment, there were good preconditions for reporting adverse events	71.4	19.4	9.2
In my working environment there was a safe culture to talk about and report adverse events	71.2	19.7	9.1

Extra analyses were carried out to see whether younger doctors responded differently than older doctors on the variables concerning open culture, but no significant differences were found. Men were more positive about having a safe environment to talk about and report adverse medical events than women.

Experienced support during the disciplinary procedure

Doctors felt most often supported by a lawyer or legal representative, their colleagues and their supervisor (table 3). Few doctors felt obstructed during the disciplinary procedure.

[2] Data is only available for age 65 and older.

Table 3: Have you experienced support or obstruction during the disciplinary procedure by: (N = 26-195)	Little bit/much obstruction (%)	No support and no obstruction (%)	Little bit/much support (%)
One or more colleagues (n=195)	2.1	8.7	89.2
My supervisor(s) (n=85)	8.2	24.7	67.1
A lawyer or other legal representative (n=181)	3.9	3.3	92.8
A complaints officer (n=65)	4.6	50.8	44.6
A (professional) confidant (n=26)	3.9	42.3	53.8
My professional association (n=31)	9.7	67.7	22.6

(*) For each category of support respondents could answer N/A. Respondents answering N/A were excluded from the analysis.

Perceived changes to professional practice due to the disciplinary procedure

Doctors report an influence of the procedure on professional practice (table 4). For most doctors, the influence of the disciplinary procedure is mostly negative (47.4%), but some doctors report a both negative as a positive influence (33.5%).

Table 4: How has the disciplinary procedure influenced your professional practice? (N=209)

	%
The procedure had a mostly negative influence	47.4
The procedure had a negative as well as positive influence	33.5
The procedure had a mostly positive influence	7.7
The procedure had no influence	11.5

Table 5 shows what kind of changes doctors reported as due to the disciplinary procedure. The changes most reported were discussing improvement measures with colleagues and/or managers (60.8%); trying to avoid risky patients (43.1%) and doing supplementary research earlier (41.3%).

Table 5: Percentage of doctors who agree or totally agree with statements about changes in their professional practice due to the disciplinary procedure (N=166-184)

Since the disciplinary process:	**Total** (%)
I have discussed possible improvement measures with my colleagues / managers	60.8
I try to avoid risky patients	43.1
I do supplementary research earlier	41.3
I see each patient as a potential new complainant	37.4
I accede more to the wishes of patients	35
I avoid patients similar to the complainant	32.0
I avoid certain actions	27.6
I see that it was necessary to implement improvement measures	26.3

I try to communicate better with patients	26.7
I can signal dissatisfaction in patients earlier	16

Table 6 shows the relationship (or lack thereof) between open culture, support and changes to professional practice. We found no significant relationship between open culture and perceived changes to professional practice. Neither was there a significant relationship between the level of support by colleagues or supervisors and perceived changes to professional practice. Feeling supported by a lawyer and/or legal representative, however, is related to less change in professional practice. Also feeling supported by a professional confidant or professional association, the level of support related to less change in professional practice.

Table 6: Univariate linear regression analyses between open culture, support and changes to professional practice (outcome variable)

Variable	Unstandardized coefficient B†	T-value	p-value
Open culture	**-0.112**	**-1.69**	**0.092**
Support of colleagues	**0.069**	**0.98**	**0.328**
Support of supervisors	**-0.06**	**-0.84**	**0.401**
Support of lawyer	**-0.13**	**-1.98**	**0.049**
Support of complaint officer	**-0.107**	**-1.29**	**0.202**
Support of professional confidant	**-0.231**	**-2.22**	**0.036**
Support of professional association	**-0.529**	**-2.79**	**0.01**

DISCUSSION

From a procedure that aims to correct professionals' behaviour, it is to be expected that doctors experiencing a disciplinary procedure perceive changes to their professional practice as a result. The changes that were reported most often were: discussing improvement measures (60.8%), trying to avoid risky patients (43.1%), doing supplementary research earlier (41.3%) or seeing each patient as a new potential complainant (37.4%). These changes mostly reflect behaviour that is associated with defensive medicine [11, 29, 30]. As we concluded in an earlier study, these results might support the reasoning that complaint procedures have a counterproductive effect on quality improvement [1].

In the Netherlands, as elsewhere, quality improvement in healthcare has seen a lot of attention. Central to this attention have been efforts to move away from blame culture, towards a more open and 'just' culture [16, 31, 32]. A more promising result of our study, therefore, is that doctors in our study generally perceive their work environment as open and indicate they feel safe to address unsafe behaviour and adverse medical events.

Disciplinary procedures are potentially stigmatic [3] and disciplinary complaints are confidential. This means that most doctors needing support will actively need to reach out themselves. Whereas Bourne et al. report bullying and undermining during complaints procedures [33], only few doctors in our study felt obstructed ('tegengewerkt' in the original Dutch questionnaire, which can also mean 'undermined'), and a number of doctors in our study sought and found support within their work environment. Doctors mostly felt supported by colleagues and supervisors. Also, doctors felt supported by a lawyer and/or legal representative, who sometimes work in the healthcare institutions, are provided by doctors' liability insurers or hired by doctors themselves.

A growing number of Dutch healthcare institutions provide support to their doctors after adverse medical events [34, 35] in the form of 'peer support', as advocated in scientific literature [6, 15, 36]. It is encouraging that support by colleagues is, indeed, perceived as supportive in the context of a disciplinary procedure as well. Still, feeling supported by colleagues did not relate to perceived changes in professional practice, and neither did the support by supervisors. The necessity of an

open culture and support within the work environment notwithstanding, working in an open and supportive environment does not seem to be sufficient to relieve the negative perception doctors have of the impact of disciplinary procedures.

There were other forms of support that did show a significant effect. The strongest effect we found was support by a professional association. An example of support by a professional association is the "Doctors' infoline" ("Artseninfolijn") provided by the Royal Dutch Medical Association (KNMG). Doctors can contact the infoline with questions on legal and ethical issues, but the infoline offers a sympathetic ear as well, a feature that might be brought under greater attention. A significant relationship between the support of a lawyer and a professional confidant and perceived changes to professional practice exists as well. Doctors reporting more legal support, reported less changes to their professional practice.

It seems that doctors receiving a disciplinary complaint might do well to seek legal advice. Employers and/or supervisors informed about disciplinary proceedings would do equally well to provide legal representation or urge doctors to seek legal advice. However, involving legal professionals can lead to a more formal and adversarial course of proceedings. As adversarial legal proceedings can be harmful in itself [2, 37-40], further research into form and content of helpful, restorative legal representation is necessary to provide the legal support healthcare professionals need.

Conclusion

Disciplinary procedures are major events that cause doctors serious emotional distress and potentially trigger defensive practice. The literature concerning 'second victims' supports the reasoning that supporting doctors after adverse medical events helps to reduce the impact of adverse medical events on healthcare professionals. Our results show that supporting doctors in the work environment is not a panacea. Legal representation and the support by a professional association alleviated the impact of disciplinary procedures on doctors' perceived changes to professional practice. From the perspective of quality improvement, these results raise serious questions regarding the management of disciplinary complaints.

Limitations

This study assesses whether doctors perceive their work environment as open and supportive and how this relates to changes to their professional practice after disciplinary procedures. As disciplinary procedures are aimed at quality improvement, this is a valuable addition to the existing body of research.

- The results are self-reported by the respondents.
- The response rate was moderate, which may have caused a non-response bias. Non-response analysis was not possible because no characteristics of the non-respondents are available, in part due to meticulous privacy regulations. An important reason for the non-response could be that filing in the questionnaire made respondents uncomfortable because it revived the situation that the complaint was about. Another reason could be that the disciplinary procedure was already a great burden, making people reluctant to participate.
- Consequences of the moderate response rate could be that the study population is not representative to the entire group of doctors who received a disciplinary measure. Possibly, a specific group of disciplined doctors, for instance, those who feel more empowered, may have responded to our questionnaire. The opposite might also be true, in the sense that those doctors who are less empowered responded to our questionnaire, for instance doctors who are not able to leave the disciplinary experience behind.
- The study population was not comparable to the Dutch population of doctors in terms of age and gender. It is unclear why the percentage of males is so high in the study population. The fact that the study population is older compared with the Dutch population can be explained

by the fact that the older the doctor is, the more chance there is that they will ever have a complaint filed against them.

- Complaint and disciplinary procedures differ between jurisdictions, possibly influencing the severity of the perceived impact. Results should be generalized with caution, taking the specifics of Dutch disciplinary law in consideration when doing so.

CONTRIBUTORSHIP STATEMENT

BL, RB, AV and RF participated in the design of the principal study. RB analyzed the data. BL, RB, AV and RF interpreted the analyses. BL and RB drafted the manuscript. All authors critically revised and approved the final manuscript. All authors agreed to be personally accountable for the author's own contributions and for ensuring that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and documented in the literature.

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COMPETING INTERESTS

The authors declare no conflict of interests.

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DATA SHARING STATEMENT

Extra data is available by emailing R. Bouwman: r.bouwman@nivel.nl

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

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract Title: Can Open Culture and Support in the Work Environment Mitigate the Impact of Disciplinary Procedures on Medical Doctors? A Questionnaire among Medical Doctors in the Netherlands
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found P. 1
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported P. 2 – 3
Objectives	3	State specific objectives, including any prespecified hypotheses P. 4
Methods		
Study design	4	Present key elements of study design early in the paper P.4 – 5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection P.4 – 5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants P.5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable P. 5
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

		P. 6, P. 7, P. 8
Bias	9	Describe any efforts to address potential sources of bias Mentioned in Abstract at P.2, and in discussion at P. 10)
Study size	10	Explain how the study size was arrived at Explained at Item no. 13
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why P.5-6
Statistical methods	12	Describe all statistical methods, including those used to control for confounding: P. 6
		Describe any methods used to examine subgroups and interactions: P.5
		Explain how missing data were addressed: Respondents with missings on a certain variable were left out of the analyses, number of respondents included in the analyses are given in each table in the manuscript. If respondents answered N/A, these were coded as missing. This is mentioned in tables. Missings vary from 3-61.
		(*d*) If applicable, describe analytical methods taking account of sampling strategy: N/A
		(*e*) Describe any sensitivity analyses: N/A
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 P. 5 and 6, and in each table.
		(b) Give reasons for non-participation at each stage P. 10
		(c) Consider use of a flow diagram N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders P. 6

		(b) Indicate number of participants with missing data for each variable of interest: Number of respondents included in the analyses are given at each table, missings vary from 3-61
Outcome data	15*	Report numbers of outcome events or summary measures P. 6
Main results	16	*(a)* Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included N/A
		(*b*) Report category boundaries when continuous variables were categorized N/A
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses N/A
Discussion		
Key results	18	Summarise key results with reference to study objectives P. 8 – 9
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 P. 8 – 9
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence P. 9
Generalisability	21	Discuss the generalisability (external validity) of the study results P. 9 (In limitations: Complaint and disciplinary procedures differ between jurisdictions, possibly influencing the severity of the perceived impact. Results should be generalized with caution, taking the specifics of Dutch disciplinary law in consideration when doing so.)
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 P. 10

*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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Is the Perceived Impact of Disciplinary Procedures on Medical Doctors' Professional Practice Associated with Working in an Open Culture and Feeling Supported? A Questionnaire among Medical Doctors in the Netherlands who have been Disciplined

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Is the Perceived Impact of Disciplinary Procedures on Medical Doctors' Professional Practice Associated with Working in an Open Culture and Feeling Supported? A Questionnaire among Medical Doctors in the Netherlands who have been Disciplined

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ABSTRACT

Introduction

Disciplinary procedures can have a negative impact on the professional functioning of medical doctors. In this questionnaire study, doctors' experience with open culture and support during a disciplinary procedure is studied in order to determine whether open culture and support are associated with perceived changes in the professional practice of doctors.

Methods

All doctors who received a warning or a reprimand from the Dutch Medical Disciplinary Board between July 2012 and August 2016 were invited to fill in a 60-item questionnaire concerning open culture, perceived support during the disciplinary procedure, and the impact of the procedure on professional functioning as reported by doctors themselves. The response rate was 43% (n=210).

Results

A majority of doctors perceive their work environment as a safe environment in which to talk about and report incidents (71.2% agreed). Respondents felt supported by a lawyer or legal representative or colleagues (92.8% and 89.2%). The disciplinary procedure had effects on professional practice. Legal support, support from a professional confidant and from a professional association were associated to fewer perceived changes to professional practice.

Conclusion

Our study shows that doctors who had been disciplined perceive their working environment as open. Doctors felt supported by lawyers and/or legal representatives and colleagues. Legal support was associated with less of a perceived impact on doctors' professional practice.

Strengths and limitations of this study

- This study offers valuable insight into the perceived impact of disciplinary procedures, a relevant topic given efforts to improve healthcare quality, as similar complaint procedures exist across jurisdictions.
- The response rate was moderate, which may have caused a non-response bias;
- The study population was not comparable to the Dutch population of doctors in terms of age and gender.
- The study has a retrospective design and the impact is based on self-reported experiences.

INTRODUCTION

Legal procedures in healthcare, such as disciplinary, complaint or claim procedures, can have negative consequences for the health and professional functioning of the healthcare professional [1-4]. Disciplinary procedures following adverse medical events can be particularly harmful, as adverse

medical events are often traumatic experiences in their own right. Some doctors can even become a 'second victim' because of the event, meaning 'a healthcare provider involved in an unanticipated adverse patient event (…) become(s) victimised in the sense that the provider is traumatised by the event'. [5-8].

The additional impact of harmful legal proceedings raises concerns about 'defensive medicine' [9]. As a concept, defensive medicine originated in the United States. Over the years, several substantially similar and overlapping definitions of defensive medicine have been offered, holding that defensive medicine 'includes all medical actions that physicians do without considering them the standard of care according to their clinical knowledge; these actions are meant to shield physicians from negligence or malpractice lawsuits filed by patients or their families.' [10]

European authors have adopted the concept and have recently begun to adapt it to apply to their respective legal cultures, which are often not as susceptible to medical liability claims as the United States [10, 11]. Fear of loss of reputation, triggered by shame and a social culture oriented to individual blame, are identified as complimentary triggers of defensive medicine [10]. A recent study by Assing Hvidt et al. into Danish GPs' understanding of defensive medicine identified fear of external demands such as patient pressure, system pressure, the pressure to conform to evidence-based guidelines, peer pressure or even self-pressure, resulting from fear of harming the patient, as potential factors in defensive medicine. Assing Hvidt et al. consequently define defensive medicine as 'unnecessary and meaningless actions driven by external demands instead of a focus on the patient's problem'. [12]

Defensive medicine can be detrimental to the quality of healthcare and lead to unnecessarily high costs [13]. But it can also be argued that defensive medicine has positive effects as well. Therefore, Summerton distinguishes between positive and negative factors in defensive medicine [14]. Negative practices occur when doctors do not perform at a socially and clinically ideal level. Negative practices include 'increased referral rate' and 'increased diagnostic testing'. Positive practices are 'more detailed note taking' and 'more detailed explanation of procedures to patients' and are considered quality improvements.

Quality improvement has been a priority in healthcare, and being open and learning from mistakes has been a particular focus [15-17]. But being open can be difficult. Professionals' own emotional distress, shame, lack of communicational skills and fear of the patient's reaction can be barriers to openness. Fears associated with the prevalence of blame culture, such as the risk of legal or reputational consequences and the lack of support from peers and the institution, further decrease professionals' willingness to disclose adverse events [18, 19]. [20].

A lack of proactive disclosure and a perceived lack of willingness to learn, however, are the most pressing reasons for patients to file a complaint (whether disciplinary or otherwise) or a claim [21, 22]). In order to break this vicious cycle and facilitate disclosure, efforts are being made to move from a blame culture to a 'just culture' in healthcare. In a just culture, it is safe to disclose incidents, which are investigated respectfully and without stigmatizing or punishing professionals. Furthermore, in a just culture professionals are supported after adverse medical events [23-25]. Therefore, openness and supporting professionals are elements of a just culture that aids learning and quality improvement.

In the context of these developments, disciplinary procedures have been the subject of increasing criticism in the Netherlands. Critics raise questions about the impact of disciplinary procedures and whether or not this leads to higher quality of care [26-28]. Especially controversial was the (recently abolished) disclosure of disciplinary measures online and in regional newspapers. To study the impact of publishing disciplinary measures on doctors' health and professional functioning, we conducted a survey study in 2016. Responding doctors mentioned several changes to professional practice, such as avoiding patients similar to the complainant [1]. Doctors whose disciplinary measures were disclosed reported a greater impact. We concluded that, albeit that some of the reported changes in professional practice might have a positive outcome, most are associated with defensive medicine. These findings suggest disciplinary procedures can obstruct the primary aim

of disciplinary law: improving the quality of professional practice (see Box 1: Information about the Dutch disciplinary system).

Taking the extensive body of literature concerning second victims into account [5-7, 29, 30], we concluded that 'supporting doctors after complaints and patient safety incidents, enabling them to learn from mistakes and aiding them in disclosure, should be systematically embedded to ensure doctors' and patients' best interests.' Plews-Ogan et al. use the term 'post-traumatic growth' as described by Tedeschi and Calhoun [31] to demonstrate how supporting healthcare professionals after adverse medical events can even help doctors to become better doctors. Peer support, talking to the patient, becoming an expert about the cause of the event, and learning from the event are all coping mechanisms that promote growth [32]. Therefore, we hypothesized, supporting doctors might reduce the negative impact of disciplinary procedures, and might result in learning instead.

However, disciplinary procedures occur outside the work environment and complaints are individual and confidential, which means that supervisors and/or colleagues are not informed about the procedure unless the professional takes the initiative to inform them himself or herself. The stigmatic nature of disciplinary complaints possibly hinders doctors from seeking or receiving support. Secondly, a disciplinary complaint is not necessarily related to the occurrence of an adverse medical event. Therefore, we do not know whether support within the institution extends to support during disciplinary procedures, and whether this support is enough to mitigate the negative impact of disciplinary procedures on professional functioning.

Gaining insight into these issues is important, as disciplinary procedures are meant to contribute to quality improvement by correcting professionals' behaviour. Nurturing a culture that is open and supports doctors after adverse medical events potentially aids doctors' recovery and possibly helps the doctor learn from the event. The hypothesis is that supporting doctors may mitigate the negative impact of the procedure. As a disciplinary procedure is supposed to be a learning experience, the present study investigates the extent to which doctors in the Netherlands experience their working environment as a safe environment where they can be open about incidents, and whether an open culture and perceived support during the disciplinary procedure is associated with the perceived occurrence of changes to professional practice resulting from the disciplinary procedure.

Box 1: Information about the Dutch disciplinary system

The Dutch disciplinary system as set down in the Individual Healthcare Professions Act (BIG Act) is aimed at correcting the professionals' behaviour, improving healthcare quality, and learning. Patients and other parties with a direct interest (the Dutch Healthcare Inspectorate, employers or, under certain conditions, colleagues) can file a complaint with a regional Medical Disciplinary Board. There is one possibility for appeal, with the Central Disciplinary Board.

Even though the procedure places the professional conduct of individual doctors under scrutiny, the disciplinary procedures do not have the formal purpose of punishing doctors. A valid complaint does not entitle patients to financial compensation. Patients seeking financial compensation can file a claim with the healthcare institution, which is then often settled between parties before it is handled in court.

The BIG Act sets out two disciplinary standards. The first refers to individual healthcare; the standard is not met if a patient's need for care is neglected, for example if the patient is given incorrect information, if there is an incorrect or delayed diagnosis or if there is a failure to perform a treatment. The second disciplinary norm refers to the general interest embodied in proper pursuit of the profession. This includes administrative actions, dealing with colleagues, or actions in the media. The conduct of healthcare professionals assessed under disciplinary standard (1) is measured against the professional standard. The professional standard is composed of the state of

the art of medical practice, which the disciplinary boards determine based *inter alia* on relevant guidelines, protocols, scientific publications and case law [33, 34].

If a complaint is judged valid, doctors can be disciplined with (in increasing order of the gravity of the measure) a warning, a reprimand, a monetary fine, a conditional or definite suspension, withdrawal of the right to perform certain treatments or the right to re-register (in cases where a professional voluntarily resigns from a register), or removal from the register. Professionals receive a warning when behaviour was not entirely correct but not reprehensible. Professionals who acted in breach of the professional standard but who are still fit for unconditional practice receive a reprimand. In practice, the line between a warning and a reprimand can be vague.

Although other countries, such as Germany, the UK and the USA, have disciplinary systems where comparable measures can be imposed, there are also important differences. For instance, there are differences in definitions used (such as fitness to practice versus professional misconduct), and the structures and levels of the bodies handling them, and the likelihood of a formal judgement after a complaint has been received can vary greatly [35, 36]. These differences in procedural characteristics have to be taken into account when comparing research outcomes.

AIM AND RESEARCH QUESTIONS

This study is part of a larger project conducted in 2016 to gain insight into the experiences of BIG registrated healthcare professionals with the impact from a disciplinary procedure, a disciplinary measure and the publishing of a disciplinary measure. In the original study we differentiated between healthcare professionals getting a warning and a reprimand (see Box 1 for the difference between disciplinary measures). At the time, reprimands were publicly disclosed, but warnings were not. Since April 2019, reprimands are only disclosed when the disciplinary judge considers disclosure necessary. Therefore, the distinction between warnings and reprimands was not maintained in the present study's analyses.

In our questionnaire we included questions related to open culture and perceived support during disciplinary procedures. This study aims to gain insight into the relationship between the experienced open culture and support on the one hand and changes in professional practice after a disciplinary measure on the other hand. The research questions were:

1) To what extent do Dutch medical doctors who received a disciplinary measure perceive their work environment as an open culture?
2) To what extent do Dutch medical doctors who received a disciplinary measure experience support during the disciplinary procedure?
3) To what extent do Dutch medical doctors report changes in their professional practice after a disciplinary measure?
4) Is there a relationship between an open culture and support, and perceived changes in professional practice after a disciplinary measure?

METHODS

Study population and data collection

This study focused on all Dutch medical doctors who received a warning or reprimand from the Disciplinary Board during the period July 2012 to August 2016. In order to create a homogenous study population with comparable contextual factors such as education, all healthcare professionals other than medical doctors were removed from the dataset. Doctors were enrolled in the study through the disciplinary boards. All doctors with a reprimand or warning received a letter in September 2016 inviting them to fill in a questionnaire online. Two reminder letters were sent to increase the response rate. Privacy was considered very important given the sensitivity of the

subject, so in close consultation with the disciplinary boards and the Ministry of Health we took the following measures:

- All letters were sent by the disciplinary board; the doctors remained anonymous for the researchers.
- A privacy policy was drawn up describing the process. This privacy policy was sent with the letter requesting participation in the study.
- All letters were sent in a plain white envelope without sender address, and the word 'confidential' was printed on the envelope.
- For privacy reasons, no response records were kept, so the two reminder letters were sent to all professionals.
- The disciplinary boards received no information about which doctors did or did not respond, and neither did the researchers.

Questionnaire

We used a pre-structured questionnaire, which means that respondents only needed to answer questions relevant to them. For example, if question 3: 'Is this your current profession?' was answered 'no', respondents did not have to answer questions about their work environment. The pre-structured questionnaire was developed by the research group. The questionnaire is based on insights from the national and international literature concerning the impact of disciplinary procedures, and on questionnaires used in other studies [2, 3, 37, 38]. We used existing questionnaires on the impact of disciplinary procedures as a basis for the current study. Those questionnaires were combined and adjusted. Besides general characteristics (respondent's characteristics and occupation), the questions relevant for this study concerned the open culture, support and changes to professional practice.

Open culture

- Open culture as a concept was not introduced separately. Agreement with three statements about a perceived open culture in the direct work environment was measured using a 5-point scale ranging from (1) 'totally agree' to 'totally disagree' (5). The statements were adapted from Heuver et al [39].

Support:

- Six questions about the extent of perceived support during the procedure from people in the work environment (colleagues, supervisor, lawyer or other legal representative, complaints officer, (professional) confidant, professional association) were measured on a 5-point scale: 'a lot of support' (5), 'a little support' (4), 'no support, but no obstruction either' (3) 'a little obstruction' (2) 'a lot of obstruction' (1)

Changes to professional practice:

- One question about the perceived influence of the disciplinary procedure on professional practice with four answer categories: the procedure had no influence; the procedure had a mostly positive influence; the procedure had both a positive and a negative influence; the procedure had a mostly negative influence.
- 11 statements about changes in their professional practice due to the disciplinary procedure, based on a review of the literature [2-4].

To check the face validity of the questionnaire, we asked the members of advisory committees of medical professionals, disciplinary board members, the Patient Federation of the Netherlands and the Ministry of Health, Welfare and Sports to review the questionnaire and give their comments (in writing). The questionnaire was adjusted based on their suggestions, and then sent to 10 healthcare professionals. As the original study involved BIG-registered healthcare professionals in general, not just medical doctors, the questionnaire was sent to four healthcare psychologists, four medical doctors, one nurse and one physiotherapist registered under the BIG Act. After answering the draft

questionnaire, each professional was asked (in writing) if the questions were properly understandable and clearly formulated, whether the answer categories were correct, whether they thought any answer categories or questions were missing, whether it was easy to fill in and whether the questionnaire was logically structured. This method can be considered as a form of retrospective cognitive interviewing [40] and the feedback was used to draw up the final version of the questionnaire.

Study population

The response rate was 43% (n=294). The questionnaires of the following classes of respondents, which may overlap, were removed from the data file: respondents who (a) indicated that they had not received a reprimand or warning (n = 37), (b) stated that the disciplinary process had not yet been completed (n = 5), (c) filled in less than half of the questions (n = 2), (d) had an occupation other than medical doctor, for example a nurse (n=84). A total of 210 respondents remained in the data file.

Statistical analyses

Descriptive analyses were performed on the measured variables.
A scale (α=0.86) was constructed from the three items concerning open culture in the work environment. The support items did not fit into one scale. One scale was constructed from 10 of the 11 items measuring changes in professional practice (α=0.82). One item did not fit into this scale. New variables on open culture and changes in professional practice were created for the scales by summing the scores on the items and dividing them by the total number of items.
Univariate linear regression analysis was performed for each of the independent variables (scale for an open culture in the work environment, six support items) and the dependent variable (scale for changes in professional practice). We considered differences to be significant where they had a p-value of <0.05.
Questions that were answered as 'not applicable' were coded as missing. Missing values were left out.

Ethical considerations

This study was based on questionnaires completed by doctors; no patients were involved. As all the research participants were competent individuals and no participants were subjected to any interventions or actions, no ethical approval was needed under Dutch law on medical research (Medical Research Involving Human Subjects Act, http://www.ccmo.nl). Participation in the study was voluntary. The questionnaire data was stored and analysed anonymously, in accordance with the Dutch Personal Data Protection Act (http://www.privacy.nl/uploads/guide_for_controller_ministry_justice.pdf).

Patient and public involvement

No patient involved.

RESULTS

General characteristics of the study population and complaints process

Males (78.7%) and the over-50 age groups (together 75.2%, Table 1) are overrepresented in our study population. As a contrast, in the total Dutch population of doctors in 2015, 49.4% were male, and 6.2%[1] were older than 65 [41]. In our study population, 38.4% were general practitioners, 48.2% medical specialists, 13.4% other (for instance, a medical doctor in training). For more than one third of the respondents, more than two years had gone by since they received their warning or reprimand (not in table). Of all respondents, 78.6% were given a warning and 21.4% a reprimand.

[1] Data is only available for age 65 and older.

Table 1: Characteristics of the study population (n=207-210)

	Total (%)
Age	
39 or younger	5.2
40-49	19.5
50-59	38.1%
60 or older	37.1
Male	78.7
Female	21.3

Open culture

Most doctors experience their work environment as open in the sense that they feel it is safe to talk about adverse events and report adverse events (71.2%); just 9.2 % disagree (table 2).

Table 2: Indicate your agreement with the following statements (N=206-210)

	Agree/totally agree (%)	Neutral (%)	Disagree/totally disagree (%)
In my work environment, it was safe to address unsafe behaviour	63.6	27.2	9.2
In my work environment, there were good preconditions for reporting adverse events	71.4	19.4	9.2
In my work environment, there was a safe culture to talk about and report adverse events	71.2	19.7	9.1

Extra analyses were carried out to see whether younger doctors responded differently to older doctors for the variables concerning open culture, but no significant differences were found. Men were more positive about having a safe environment in which to talk about and report adverse medical events than women.

Experienced support during the disciplinary procedure

Doctors were most likely to have felt supported by a lawyer or legal representative, their colleagues and their supervisor (table 3). Few doctors felt obstructed during the disciplinary procedure.

Table 3: Have you experienced support or obstruction during the disciplinary procedure from: (N = 26-195)	**A little/a lot of obstruction (%)**	**No support and no obstruction (%)**	**A little/a lot of support (%)**
One or more colleagues (n=195)	2.1	8.7	89.2
My supervisor(s) (n=85)	8.2	24.7	67.1
A lawyer or other legal representative (n=181)	3.9	3.3	92.8
A complaints officer (n=65)	4.6	50.8	44.6
A (professional) confidant (n=26)	3.9	42.3	53.8

My professional association (n=31)	9.7	67.7	22.6

(*) For each category of support, respondents could answer N/A. Respondents answering N/A were excluded from the analysis.

Perceived changes to professional practice due to the disciplinary procedure

Doctors reported an influence of the procedure on professional practice (Table 4). For many doctors, the influence of the disciplinary procedure has been mostly negative (47.4%), but a third of doctors reported both a negative influence and a positive influence (33.5%).

Table 4: How has the disciplinary procedure influenced your professional practice? (N=209)

	%
The procedure had a mostly negative influence	47.4
The procedure had both a negative influence and a positive influence	33.5
The procedure had a mostly positive influence	7.7
The procedure had no influence	11.5

Table 5 shows what kind of changes doctors reported as due to the disciplinary procedure. The changes reported most were discussing improvement measures with colleagues and/or managers (60.8%), trying to avoid risky patients (43.1%) and doing supplementary tests earlier (41.3%).

Table 5: Percentage of doctors who agree or totally agree with statements about changes in their professional practice due to the disciplinary procedure (N=166-184)

Since the disciplinary process:	**Total** (%)
I have discussed possible improvement measures with my colleagues / managers	60.8
I try to avoid risky patients	43.1
I do supplementary tests earlier	41.3
I see each patient as a potential new complainant	37.4
I give in to the wishes of patients earlier	35.0
I avoid patients similar to the complainant	32.0
I avoid certain actions	27.6
I see that it was necessary to implement improvement measures	26.3
I try to communicate better with patients	26.7
I am able to spot dissatisfaction in patients earlier	16

We found no significant relationship between an open culture and perceived changes to professional practice (table 6). Neither was there a significant relationship between the level of support from colleagues or supervisors and perceived changes to professional practice. Feeling supported by a lawyer and/or legal representative, however, is associated to less change in professional practice. Also feeling supported by a professional confidant or professional association is associated to less change in professional practice.

Table 6: Univariate linear regression analyses of the effect of open culture and support on changes to professional practice (outcome variable)

Variable	Unstandardized coefficient B†	T-value	p-value
Open culture	-0.112	-1.69	0.092
Support of colleagues	0.069	0.98	0.328
Support of supervisors	-0.06	-0.84	0.401
Support of lawyer	-0.13	-1.98	0.049*
Support of complaints officer	-0.107	-1.29	0.202
Support of professional confidant	-0.231	-2.22	0.036*
Support of professional association	-0.529	-2.79	0.01*

(*) P value < 0,05.

DISCUSSION

Given that the procedure aims to correct professionals' behaviour, it is to be expected that doctors experiencing a disciplinary procedure perceive changes to their professional practice as a result. Despite the finding that a majority of doctors state they have discussed changes with colleagues or managers, the impact of the disciplinary procedure is mostly seen as negative. Our findings are further put into perspective by the relatively low percentage of doctors (26.3%) who also believed implementing improvement measures was necessary. Furthermore, in line with results by Bruers et al., we found that one third of the respondents perceive the impact of the disciplinary procedure as negative and positive simultaneously [2, 4]. As we concluded in our earlier study, learning, if it occurs at all, comes at a high price.

We found that assigning the label 'defensive medicine' to the reported changes is not always obvious, nor appropriate. In part, this is because defensive medicine as a concept can be 'slippery' [42], because it is defined by subjective factors such as the intent of the professional [43] and because it harbours a negative connotation that might not always be appropriate, because the result is not always harmful or because it is even intended.

Defensive medicine can take the form of either assurance (positive) behaviour or avoidance (negative) behaviour. Whereas avoidance behaviour is obviously undesirable, for assurance behaviour the result might not necessarily be detrimental to the quality of care. Summerton's distinction between positive and negative factors in defensive medicine might be helpful in interpreting our results as either undesired or positive changes[14].

Summerton distinguishes between learning and performing on a suboptimal clinical and social level. Discussing improvement measures (60.8%), seeing that it was necessary to implement improvement measures (26.3%), trying to communicate better with patients (26.7%) and signalling dissatisfaction more quickly (16.0%) could be considered examples corresponding with Summerton's examples of positive changes. In the light of quality improvement this could be promising, as this is the result the disciplinary procedure seeks to achieve.

Summerton lists both avoidance and assurance behaviours as examples of negative factors in defensive medicine. Corresponding behaviour reported by doctors in our study could be avoidance behaviour such as trying to avoid risky patients (43.1%), avoiding patients similar to the complainant (32.0%) and avoiding certain actions (27.6%). Doing more supplementary research (41.3%) would be a negative factor associated with assurance behaviour, as could giving in to the wishes of patients (if we can assume the patient desires more medication, treatment or research) (35%).

We assumed working in an open culture would make it easier for doctors to reach out for support, and that both working in an open culture and feeling supported would result in the disciplinary procedure having less of a negative impact. At the same time, disciplinary procedures are potentially stigmatizing [3] and disciplinary complaints are confidential. This means that most doctors needing support will actively need to reach out themselves. A promising result of our study, therefore, is that doctors in our study generally perceive their work environment as open and indicate that they feel safe to address unsafe behaviour and adverse medical events.

Whereas Bourne et al. report bullying and undermining during complaints procedures [44], only a few doctors in our study felt obstructed ('*tegengewerkt*' in the original Dutch questionnaire,

which can also mean 'undermined'), and a number of doctors in our study sought and found support within their work environment. Doctors mostly felt supported by colleagues and supervisors. Still, feeling supported by colleagues was not associated with perceived changes in professional practice, and neither was the support from supervisors. The necessity of an open culture and support within the work environment notwithstanding, working in an open and supportive environment does not seem to be sufficient to offset the negative perception doctors have of the impact of disciplinary procedures.

We can offer several explanations that are feasible, but further inquiry would be needed to provide clear answers as to why this relationship was not found. Adequately supporting doctors as 'second victims' has only recently taken shape in the Netherlands, mostly within hospitals, and almost exclusively within the context of patient safety incidents [45]. This means that for many doctors in our study, for whom the procedure took place before 2016, it might have been difficult to identify adequate support. Another explanation might be that the procedure is damaging to such an extent that supporting the doctor is simply not sufficient to prevent negative consequences for practice. We hope the recent legislative change concerning the disclosure of disciplinary measures helps to relieve this impact. Still, for a substantial proportion of our respondents with a warning (78.6%), the measure was not disclosed.

Besides colleagues and supervisors, doctors also felt supported by a lawyer and/or other legal representative. Legal representatives are sometimes employed by healthcare institutions, or they can be provided by doctors' liability insurers or hired by the doctors themselves. We found a significant relationship between the support of a lawyer or a professional confidant and perceived changes to professional practice. Doctors who reported more legal support also reported fewer changes to their professional practice. The strongest effect we found was from support by a professional association. As we had no knowledge of organized support by professional organizations, we made enquiries with the Royal Dutch Medical Association (KNMG) as to what this support might entail. KNMG provide support through the "Doctors' info line" ("Artseninfolijn"). Doctors can contact the info line with questions on legal and ethical issues, but the info line offers a sympathetic ear as well. Given our results, this is a feature that deserves greater attention.

Our results seem to suggest that, in order to prevent defensive practice, doctors receiving a disciplinary complaint might do well to seek legal advice. Equally, employers and/or supervisors informed about disciplinary proceedings would do well to provide legal representation or urge doctors to seek legal advice. However, involving legal professionals can lead to a more formal and adversarial course of proceedings. As adversarial legal proceedings can be harmful in their own right [2, 46-49], further research into the form and content of helpful, restorative legal representation is necessary to provide the legal support healthcare professionals need.

Another implication for further research might be the gender difference we found as regards having a safe environment in which to report and talk about patient safety incidents. Our finding is in line with findings from Martowirono et al. Martowirono et al. speculate that women might be more safety oriented than men and more likely to communicate about patient safety. Another explanation might be offered by the various studies demonstrating the continuing prevalence of gender inequality in healthcare [50][51]. A recent study analysing performance evaluations of first-year and third-year residents in emergency medicine has shown that women making medical errors receive harsher comments in comparison to their male counterparts. Also, making errors is seen as limiting their ability to practice emergency medicine, whereas men making similar mistakes are still seen as able to pursue a career in academic medicine [52]. Taking these results into account, the perceived safety of the work environment might also be influenced by the fact that 'it's a man's world'.

Conclusion

At first glance, our results seem to indicate that disciplinary procedures have both positive and negative effects on professional practice. Discussing improvement measures and trying to

communicate better with patients, for instance, can be defined as a positive change or as learning from the procedure. This is what the disciplinary procedure seeks to achieve.

Most doctors, however, perceived the disciplinary procedure as having a negative effect, raising the question of whether the potential to learn from the procedure is realized in practice. Furthermore, disciplinary procedures trigger negative practices, such as avoiding risky patients, which can be seen as an undesired response to the particular characteristics of the disciplinary complaint.

The literature concerning 'second victims' bears out the reasoning that supporting doctors after adverse medical events helps to reduce the negative impact of adverse medical events on healthcare professionals. Our results show that supporting doctors in the work environment is not a panacea. Combining these insights with our preceding conclusions concerning the impact on health, personal and professional functioning and career opportunities, the gains of disciplinary procedures do not seem to outweigh the costs, raising serious questions regarding the management of disciplinary complaints.

Limitations

This study provides insight into the impact of disciplinary procedures on doctors' professional practice, and whether or not these changes are associated with an open culture and support. We interpreted our results within the context of defensive medicine. As defensive medicine can be a slippery concept, we have added valuable reflection to the body of research concerning the consequences of defensive practice and whether or not changes in practices are positive or negative. As disciplinary procedures are aimed at quality improvement, this is a valuable addition to the existing body of research. Disciplinary procedures are found in differing jurisdictions. While taking the differing specifics into account, our findings can be informative for those countries with similar legal structures.

Following our research concerning the impact of disclosing disciplinary measures, Dutch legislation was amended in 2019. Disciplinary boards now have the discretionary competence to only disclose the disciplinary measure when deemed appropriate or necessary. Respondents in our study received measures that were published online and in newspapers, which influences the severity of the perceived impact.

The response rate might be seen as moderate, and there may be a non-response bias. However, disciplinary procedures are potentially traumatic and stigmatic experience. Given the sensitivity of the topic, meticulous privacy arrangements were made. Therefore, no data on characteristics is available for the non-respondents, and a non-response analysis was not possible. An important reason for the non-response could be that filling in the questionnaire made respondents uncomfortable because it revived memories of the situation that the complaint was about. Another reason could be that the disciplinary procedure was already a great burden, making people reluctant to participate. Given these circumstances, the resulting response rate was good.

One consequence of the moderate response rate could be that the study population is not representative of the entire group of doctors who received a disciplinary measure. Possibly, a specific group of disciplined doctors, for instance, those who feel more empowered, may have responded to our questionnaire. The opposite might also be true: those doctors who feel less empowered may have responded to our questionnaire, for instance doctors who are not able to put the disciplinary experience behind them.

The study population was not comparable to the Dutch population of doctors in terms of age and gender. It is unclear why the percentage of men is so high in the study population. One potential explanation might be that male doctors attract more disciplinary complaints, as was found by Cunningham et al [53]. The fact that the study population is older compared with the Dutch population can be explained by the fact that the older the doctor is, the more chance there is that they will at some point have had a complaint filed against them. It might also be that the percentage of male doctors is higher in that particular, older population.

The study design is retrospective and the perceived impact is self-reported. Given our research question, this was the best feasible design, giving a valuable insight into the experiences of doctors

who have been disciplined. However, a causal relationship between a perceived open culture and support and the perceived impact of the disciplinary procedure cannot be proven with this design and the severity of the disciplinary measure might influence the perceived impact.

CONTRIBUTORSHIP STATEMENT

BL, RB, AV and RF participated in the design of the principal study. RB analysed the data. BL, RB, AV and RF interpreted the analyses. BL and RB drafted the manuscript. All authors critically revised and approved the final manuscript. All authors agreed to be personally accountable for the author's own contributions and for ensuring that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and documented in the literature.

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COMPETING INTERESTS

The authors declare no conflict of interests.

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DATA SHARING STATEMENT

Extra data is available by emailing Berber Laarman, b.s.laarman@vu.nl.

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Page numbers refer to pages in clean manuscript (track changes not visible).

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

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract Title: Is the Perceived Impact of Disciplinary Procedures on Medical Doctors' Professional Practice Associated with Working in an Open Culture and Feeling Supported? A Questionnaire among Medical Doctors in the Netherlands who have been Disciplined
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found P. 1
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported P. 1 – 3
Objectives	3	State specific objectives, including any prespecified hypotheses P. 4
Methods		
Study design	4	Present key elements of study design early in the paper P.4 – 6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection P.4 – 5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants P.4
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable P. 6
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

		P. 6, P. 7, P. 8
Bias	9	Describe any efforts to address potential sources of bias Mentioned in Abstract at P.1, and in Limitations at P.11
Study size	10	Explain how the study size was arrived at Explained at Item no. 13
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why P.5-6
Statistical methods	12	Describe all statistical methods, including those used to control for confounding: P. 6
		Describe any methods used to examine subgroups and interactions: P.5
		Explain how missing data were addressed: Respondents with missings on a certain variable were left out of the analyses, number of respondents included in the analyses are given in each table in the manuscript. If respondents answered N/A, these were coded as missing. This is mentioned in tables. Missings vary from 3-61.
		(*d*) If applicable, describe analytical methods taking account of sampling strategy: N/A
		(*e*) Describe any sensitivity analyses: N/A
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 P. 5 and 6, and in each table.
		(b) Give reasons for non-participation at each stage P. 11
		(c) Consider use of a flow diagram N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders P. 6

		(b) Indicate number of participants with missing data for each variable of interest: Number of respondents included in the analyses are given at each table, missings vary from 3-61
Outcome data	15*	Report numbers of outcome events or summary measures P. 6
Main results	16	*(a)* Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included N/A
		(*b*) Report category boundaries when continuous variables were categorized N/A
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses N/A
Discussion		
Key results	18	Summarise key results with reference to study objectives P. 9 – 11
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 P. 11-12
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence P. 9-11
Generalisability	21	Discuss the generalisability (external validity) of the study results P. 11 (In limitations: As disciplinary procedures are aimed at quality improvement, this is a valuable addition to the existing body of research. Disciplinary procedures are found in differing jurisdictions. While taking the differing specifics into account, our findings can be informative for those countries with similar legal structures. (…)The study design is retrospective and the perceived impact is self-reported. Given our research question, this was the best feasible design, giving a valuable insight into the experiences of doctors who have been disciplined. However, a causal relationship between a perceived open culture and support and the perceived impact of the disciplinary procedure cannot be proven with this design and the severity of the disciplinary measure might influence the perceived impact.)
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 P. 10

*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.