

# BMJ Open Duration of second victim symptoms in the aftermath of a patient safety incident and association with the level of patient harm: a cross-sectional study in the Netherlands

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**To cite:** Vanhaecht K, Seys D, Schouten L, *et al.* Duration of second victim symptoms in the aftermath of a patient safety incident and association with the level of patient harm: a cross-sectional study in the Netherlands. *BMJ Open* 2019;**9**:e029923. doi:10.1136/bmjopen-2019-029923

► Prepublication history for this paper is available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2019-029923>).

Received 19 February 2019  
Revised 28 April 2019  
Accepted 21 June 2019



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## ABSTRACT

**Objectives** To describe healthcare providers' symptoms evoked by patient safety incidents (PSIs), the duration of these symptoms and the association with the degree of patient harm caused by the incident.

**Design** Cross-sectional survey.

**Setting** 32 Dutch hospitals that participate in the 'Peer Support Collaborative'.

**Participants** 4369 healthcare providers (1619 doctors and 2750 nurses) involved in a PSI at any time during their career.

**Interventions** All doctors and nurses working in direct patient care in the 32 participating hospitals were invited via email to participate in an online survey.

**Primary and secondary outcome measures** Prevalence of symptoms, symptom duration and its relationship with the degree of patient harm.

**Results** In total 4369 respondents were involved in a PSI and completely filled in the questionnaire. Of these, 462 reported having been involved in a PSI with permanent harm or death during the last 6 months. This had a personal, professional impact as well as impact on effective teamwork requirements. The impact of a PSI increased when the degree of patient harm was more severe. The most common symptom was hypervigilance (53.0%). The three most common symptoms related to teamwork were having doubts about knowledge and skill (27.0%), feeling unable to provide quality care (15.6%) and feeling uncomfortable within the team (15.5%). PSI with permanent harm or death was related to eightfold higher likelihood of provider-related symptoms lasting for more than 1 month and ninefold lasting longer than 6 months compared with symptoms reported when the PSI caused no harm.

**Conclusion** The impact of PSI remains an underestimated problem. The higher the degree of harm, the longer the symptoms last. Future studies should evaluate how these data can be integrated in evidence-based support systems.

## INTRODUCTION

It is estimated that patient safety incidents (PSIs) occur in at least one out of seven

## Strengths and limitations of this study

- This study explores an underinvestigated area in the field of patient safety and quality care: duration of healthcare provider second victim symptoms in the aftermath of a patient safety incident and its relationship with the degree of patient harm.
- The very large sample size (n=6508) as well as the large number of included Dutch hospitals (n=32) representing a cross-section of urban/rural, small/large, (non)-academic and (non)-teaching hospitals.
- In this study, the prevalence of symptoms was based on dichotomous questions (present or absent) and not evaluated by means of validated questionnaires.
- This study is based on data of approximately one-third (n=32) of all Dutch hospitals. The results are not representative for all the healthcare organisations in the Netherlands or anywhere else in the world.
- Response bias is an inherent limitation related to surveys, as also pertains to the study now reported, as well as recall bias since the self-reported presence or absence of symptoms was purely based on the respondents' recollection.

hospitalised patients.<sup>1</sup> This mostly includes incidents that cause no harm (near misses) but also incidents with temporary harm, permanent harm or death (adverse events).<sup>2</sup> In addition to the tremendous impact on patients and their family (first victims), the well-being of involved healthcare providers (second victims) may also be significantly affected.<sup>3</sup> Although there is criticism on the term second victims, no alternative term is available.<sup>4</sup> Moreover, PSI may harm the reputation of the healthcare department and entire organisation (third victims) and reduce trust in healthcare providers in general.<sup>5</sup>

Recent studies indicate that almost 80% of healthcare providers are involved in a near miss or adverse event at least once in their career and that they were emotionally affected.<sup>6 7</sup> The psychological impact depends on individual, situational and organisational aspects and affects both personal well-being and professional functioning.<sup>8-10</sup> Anxiety, fear, guilt, distress, frustration, anger and feeling insufficient are the most frequently cited symptoms.<sup>11 12</sup> In addition, healthcare providers report a significant work-home interference, greater risk of burn-out and higher intention to leave the job.<sup>13</sup>

More and more hospitals realise that they have a role in providing an institutional support system to meet second victims needs.<sup>12 14-16</sup> Healthcare professionals involved in a PSI may have an increased likelihood developing post-traumatic stress disorder (PTSD).<sup>14</sup> One of the criteria for PTSD, based on the latest criteria set by the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), is that the symptoms last for more than 1 month.<sup>15</sup> Current literature is lacking in information on duration of symptoms suffered by second victims. This hinders the development of evidence-based institutional support programmes. This study aims to describe the prevalence and duration of healthcare provider self-reported symptoms evoked by PSI, and the association between these symptoms and the degree of patient harm caused by the incident.

## METHODS

### Setting

This study was conducted at 32 hospitals in the Netherlands that participate in the 'Peer Support Collaborative'. The 32 hospitals represent approximately one-third of all Dutch hospitals and comprise a variety of large and small, rural and urban, (non)-teaching and (non)-academic hospitals. These hospitals are among the first group of Dutch hospitals who expressed the wish to implement an organisational peer support programme for second victims in the aftermath of a PSI, patient complaint or lawsuit. This collaborative aims to determine the needs of their second victims and to define a peer support programme that fits their specific organisational patient safety culture and now reports their first insights. As part of the activities of the collaborative, each hospital distributed a standard questionnaire among their doctors and nurses in order to determine their specific needs.

### Participants

Three rounds of data collection were conducted depending on the year of enrolment of the participating hospital in the peer support collaborative. Ten hospitals conducted the survey between 14 April and 15 June 2016, 9 hospitals between 1 February and 30 March 2017 and 13 hospitals between 2 June 2018 and 23 November 2018. All doctors and nurses working in direct patient care in the 32 participating hospitals were invited via email to participate in an online survey under the auspices of the

KU Leuven. Respondents could only participate once. The online survey was available during 4 weeks. The contact person participating in the peer support collaborative of each hospital distributed the web survey in his or her hospital and one email reminder was sent to all doctors and nurses in the third week of the study period. According to the regulations in Dutch hospitals, in the survey, it was mentioned that filling in the questionnaire implied informed consent to participate. Participation was entirely voluntary, and confidentiality and anonymity were guaranteed.

### Measurements

The questionnaire contained four distinct parts. The first part pertained to respondent demographics (profession, years of experience, years of work experience in this hospital, type of ward (surgical of non-surgical) and gender). The second part surveyed the presence or absence of personal involvement in PSI (during the entire career and during the previous 6 months) and the degree of harm (impact of PSI on the patient) (no harm, temporary harm, permanent harm and death). This part started with more information about what a PSI is and the difference with a not-patient safety related dramatic event. Third, personal involvement and symptoms related to the PSI were measured. These 11 symptoms were selected based on a literature research.<sup>9</sup> Response categories for the duration of the symptoms were 'none', 'some hours', 'a day', 'a week', 'a month', '2-6 months', '6-12 months' and 'more than 1 year'. The questionnaire was based on previous research<sup>13 17-19</sup> and redesigned by the participating hospitals during a meeting of the peer support network.

### Statistics

Only completely filled in questionnaires were included in the analysis, except for the prevalence rate. Demographic variables are reported and descriptive data as well as the recollection of the degree of PSI-related patient harm during the entire career and during the previous 6 months. Recollection of the presence or absence of symptoms perceived in the aftermath of a PSI is represented in individual prevalence ratios. This ratio indicates whether the specific symptom lasted for more than 1 month and for more than 6 months, and their prevalence pertaining to PSI with no patient harm, temporary harm, permanent harm and death. We opted to use prevalence ratios as these are less prone to overestimate associations compared with using ORs.<sup>16</sup> Descriptive analyses and prevalence ratios were produced using SAS V.9.4. This manuscript is compliant to the Strengthening the Reporting of Observational Studies in Epidemiology recommendations.

### Patient and public involvement

There was no patient or public involvement in this study.

**Table 1** Demographic information

	Doctors (1619)	Nurses (2750)
Gender		
Female	898 (55.5%)	2531 (92.0%)
Years of experience (mean±SD)	11.2±8.8	18.1±12.1
Type of department		
Surgical department	540 (35.4%)	751 (29.1%)
Non-surgical department	910 (59.8%)	1506 (58.3%)
Surgical and non-surgical department	73 (4.8%)	327 (12.6%)

**RESULTS**

A total of 6508 participants in 32 participating hospitals completed the questionnaire. In total 5572 respondents (1938 doctors and 3634 nurses) reported that they had been involved in a PSI at least once during their career (85.6%) and 4369 (1619 doctors and 2750 nurses) choose to completely fill out the questions regarding symptoms and were included in this study. **Table 1** summarises the demographic information of the 4369 respondents.

During their entire career, over half of respondents had only been involved in a PSI with no harm whereas approximately 45% had been involved in a PSI with permanent harm or with death (**table 2**). During the previous 6 months, 80% of the respondents had only been involved in a PSI with no harm or temporary harm whereas one in five reported having been involved in a PSI with permanent harm or death. Doctors reported more involvement in PSI resulting in permanent harm or death compared with nurses.

**Symptoms**

**Figure 1** depicts an overview of the 11 symptoms and their frequency of occurrence. The most frequently reported symptom was hypervigilance which bothered 53.0% of the respondents for more than 1 month. In frequency of occurrence, this was followed by doubts about knowledge and skill (27.0%), stress (25.8%), shame (24.7%), flashbacks (23.3%), fear (19.0%), feeling unable to provide quality care (15.6%), feeling uncomfortable within team (15.5%), avoiding risks (13.0%), feeling unhappy and dejected (12.5%) and difficulty sleeping (10.8%). The prevalences of symptoms with a duration of more

than 6 months were respectively hypervigilance (23.6%), flashbacks (8.7%), shame (8.2%), doubts about knowledge and skill (8.1%), stress (6.8%), fear (6.3%), feeling unable to provide quality care (4.8%), avoiding risks (4.5%), feeling uncomfortable within team (4.2%), difficulty sleeping (2.8%) and feeling unhappy and dejected (2.6%). Of note, in total, 3.7% of the responding doctors and 4.0% of the nurses reported never having had any symptom while a significant portion of these providers were personally involved in PSI resulting in permanent harm or death.

**Table 3** depicts an overview of the different symptoms which persisted for more than 1 month for each degree of harm. The impact of a PSI with temporary harm, permanent harm and death are more profound than a PSI with no harm, showing up to two, three, four and eightfold symptom prevalence. While the reported symptoms demonstrate a personal impact (difficulty sleeping, fear, stress, shame etc) organisations need also be aware that some symptoms also have an impact on the teamwork, patient safety and ability to provide quality care. For example, 27% of the respondents mentioned that they have doubts about knowledge and skill for more than 1 month, 15.6% feel unable to provide quality care and 15.5% feel uncomfortable within their team.

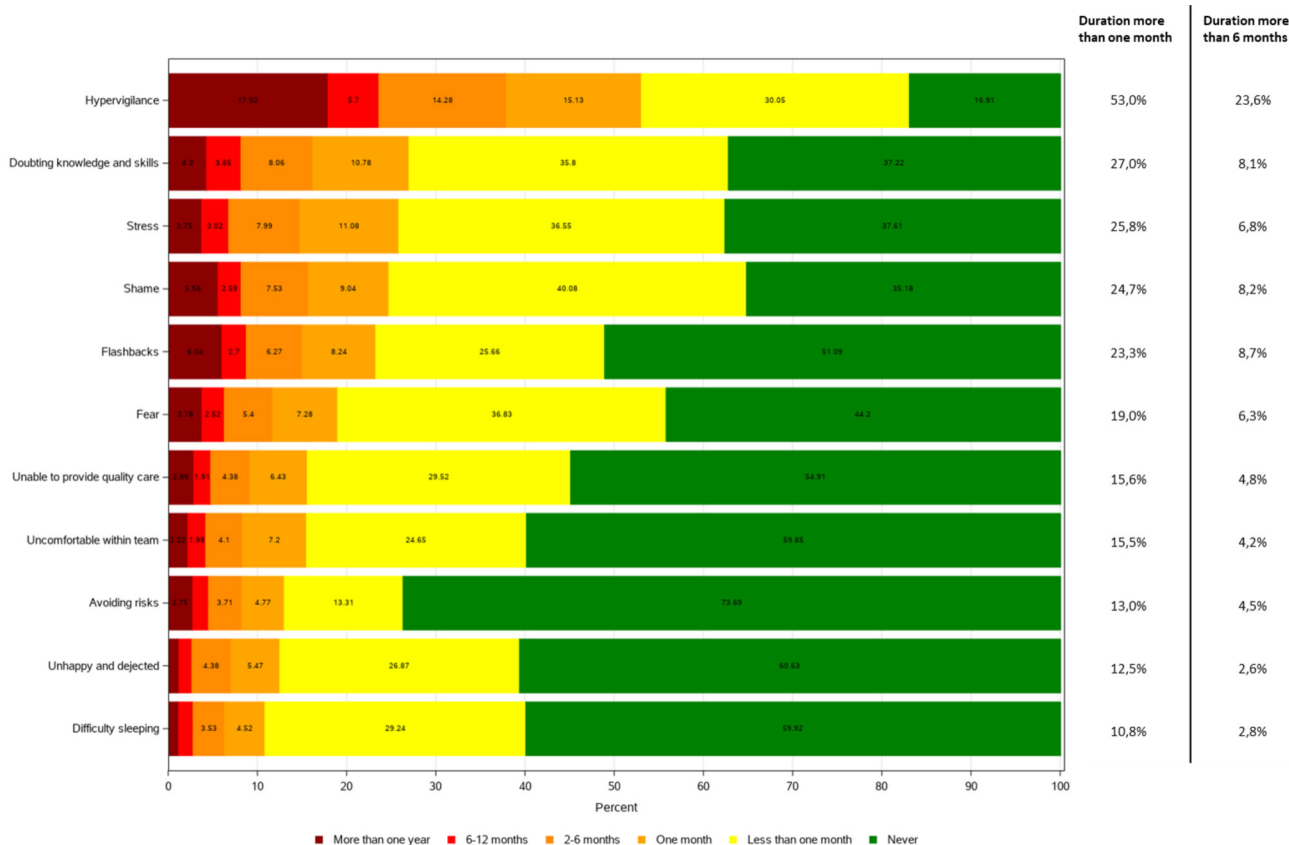
**Table 4** presents symptoms that lasted more than 6 months following the most severe PSI that was recollected by the respondent. The impact of PSI with temporary harm, permanent harm and death are more profound than a PSI with no harm, showing up to two, three, four, five, six, seven and ninefold prevalence of symptoms. Hypervigilance is the symptom which remained the most constant and independent of the degree of harm.

**DISCUSSION**

The impact of PSI on healthcare professionals remains an underestimated problem. This study adds relevant information on the prevalence and (long-lasting) duration of several self-reported symptoms and their relation with the degree of patient harm. Almost half of the respondents reported their involvement in a PSI resulting in permanent harm or death at least once during their entire career, while one in five reported involvement in a PSI resulting in permanent harm or death during the previous 6 months. Those latter 462 healthcare professionals were

**Table 2** Prevalence for the different degree of harm (reporting only patient safety incident (PSI) with the highest reported degree of harm)

Degree of harm	PSI during the entire career (n=4369)			PSI during previous 6 months (n=2379)		
	Doctors, (%)	Nurses, (%)	Overall, (%)	Doctors, (%)	Nurses, (%)	Overall, (%)
No harm	197 (12.2)	911 (33.1)	1108 (25.4)	342 (36.6)	865 (59.9)	1207 (50.7)
Temporary harm	372 (23.0)	936 (34.0)	1308 (29.9)	313 (33.5)	397 (27.5)	710 (29.8)
Permanent harm	363 (22.4)	293 (10.7)	656 (15.0)	128 (13.7)	66 (4.6)	194 (8.2)
Death	687 (42.4)	610 (22.2)	1297 (29.7)	152 (16.3)	116 (8.0)	268 (11.3)



**Figure 1** Symptoms in the aftermath of PSI. PSI, patient safety incident.

particularly at risk for poor well-being and reduced professional functioning during those previous 6 months as they were involved in a PSI with such serious sequelae. More than half of all respondents suffered hypervigilance for more than 1 month, while almost one in four suffered more than 6 months. The prevalence ratio for all symptoms increased with a higher degree of patient harm. Interestingly, this was also true for all symptoms; except for feeling unhappy and dejected and difficulty sleeping; 6 months after being involved in a PSI compared with 1 month.

The results reported are in line with previous prevalence reports pertaining to emotional responses.<sup>7 9 20</sup> We found that in addition to earlier publications reporting symptoms such as anxiety, flashback and insomnia, that hypervigilance was the most universally reported symptom (80%). A recent study of 5782 physician mothers found that involvement in a mistake was associated with higher reported burn-out.<sup>20</sup> The psychological impact of PSI on the healthcare professional is thought to be similar to that characterising PTSD.<sup>21</sup> We, therefore, chose a cut-off set at 1 month based on the criteria set by DSM-5 for PTSD.<sup>15</sup> Suffering symptoms longer than 1 month, let alone 6 months, has a profound impact on healthcare providers' professional and personal life. As personal testimonials reveal, healthcare providers cannot provide the quality of care that is needed and they are at risk of being involved in future PSI's.<sup>22</sup>

Healthcare professionals may, at some point, find themselves in a vicious circle. As healthcare workers involved in PSI are at risk of diminished personal well-being and reduced professional performance adequate institutional and peer support are more and more considered essential components in alleviating the personal and professional impact on these second victims. Healthcare organisations need more awareness that some of the symptoms, such as doubts about knowledge and skill, feeling unable to provide quality care, feeling uncomfortable with the team, may seriously impact team performance, patient safety and the provision of quality care. Organisations should, therefore, play a proactive role in providing immediate support to healthcare professionals involved in a PSI and should not wait until the healthcare professional gets depressed, develops burn-out or quits the job. The risk of not responding to a PSI in a timely and effective manner can have a significant impact on the healthcare professional involved and organisations alike. It can lead to absence of healing, loss of trust, no learning and improvement while it may also increase the likelihood of lawsuits and patient complaints.<sup>5</sup> Perceptions of second victimhood, turnover intentions and absenteeism may be less severe when the healthcare organisation's culture is characterised by a non-punitive response to errors. Such non-punitive response may encourage supportive interactions, openness to discuss error and thus mitigate the negative effects of PSI.<sup>21</sup> A recent study among Dutch

**Table 3** Overview of symptoms persisting longer than 1 month

	Doctors (n=1619)		Nurses (n=2750)	
	Prevalence no (%)	Prevalence ratio (95% CI)	Prevalence no (%)	Prevalence ratio (95% CI)
<b>Hypervigilance</b>				
No harm	85 (43.2)	Reference	433 (47.5)	Reference
Temporary harm	170 (45.7)	1.06 (0.87 to 1.29)	485 (51.8)	1.09 (0.99 to 1.20)
Permanent harm	208 (57.3)	1.33 (1.11 to 1.60)*	162 (55.3)	1.16 (1.03 to 1.32)*
Death	409 (59.5)	1.38 (1.16 to 1.64)*	365 (59.8)	1.26 (1.15 to 1.38)*
<b>Doubts about knowledge and skill</b>				
No harm	43 (21.8)	Reference	138 (15.2)	Reference
Temporary harm	102 (27.4)	1.26 (0.92 to 1.72)	184 (19.7)	1.30 (1.06 to 1.59)*
Permanent harm	152 (41.9)	1.92 (1.43 to 2.57)*	76 (25.9)	1.71 (1.34 to 2.19)*
Death	319 (46.4)	2.13 (1.61 to 2.80)*	165 (27.1)	1.79 (1.46 to 2.18)*
<b>Stress</b>				
No harm	32 (16.2)	Reference	122 (13.4)	Reference
Temporary harm	84 (22.6)	1.39 (0.96 to 2.01)	170 (18.2)	1.36 (1.10 to 1.68)*
Permanent harm	131 (36.1)	2.22 (1.57 to 3.14)*	84 (28.7)	2.14 (1.68 to 2.73)*
Death	308 (44.8)	2.76 (1.99 to 3.83)*	198 (32.5)	2.42 (1.98 to 2.96)*
<b>Shame</b>				
No harm	33 (16.8)	Reference	139 (15.3)	Reference
Temporary harm	87 (23.4)	1.40 (0.97 to 2.00)	187 (20.0)	1.31 (1.07 to 1.60)*
Permanent harm	132 (36.4)	2.17 (1.55 to 3.05)*	75 (25.6)	1.68 (1.31 to 2.15)*
Death	279 (40.6)	2.42 (1.75 to 3.35)*	149 (24.4)	1.60 (1.30 to 1.97)*
<b>Flashbacks</b>				
No harm	22 (11.2)	Reference	111 (12.2)	Reference
Temporary harm	52 (14.0)	1.25 (0.78 to 2.00)	182 (19.4)	1.60 (1.28 to 1.98)*
Permanent harm	97 (26.7)	2.39 (1.56 to 3.68)*	83 (28.3)	2.32 (1.81 to 2.99)*
Death	240 (34.9)	3.13 (2.08 to 4.70)*	229 (37.5)	3.08 (2.52 to 3.77)*
<b>Fear</b>				
No harm	23 (11.7)	Reference	94 (10.3)	Reference
Temporary harm	39 (10.5)	0.90 (0.55 to 1.46)	150 (16.0)	1.55 (1.22 to 1.98)*
Permanent harm	88 (24.2)	2.08 (1.36 to 3.18)*	63 (21.5)	2.08 (1.56 to 2.79)*
Death	211 (30.7)	2.63 (1.76 to 3.93)*	161 (26.4)	2.56 (2.03 to 3.23)*
<b>Avoiding risks</b>				
No harm	6 (5.3)	Reference	42 (6.7)	Reference
Temporary harm	23 (10.1)	1.93 (0.81 to 4.59)	57 (8.9)	1.33 (0.91 to 1.95)
Permanent harm	48 (24.4)	4.63 (2.05 to 10.48)*	25 (13.0)	1.93 (1.21 to 3.09)*
Death	104 (24.9)	4.74 (2.14 to 10.51)*	63 (14.9)	2.21 (1.53 to 3.20)*
<b>Unhappy and dejected</b>				
No harm	9 (7.9)	Reference	25 (4.0)	Reference
Temporary harm	18 (7.9)	1.00 (0.47 to 2.16)	56 (8.8)	2.19 (1.39 to 3.46)*
Permanent harm	40 (20.3)	2.57 (1.30 to 5.10)*	26 (13.5)	3.38 (2.00 to 5.71)*
Death	117 (28.1)	3.55 (1.86 to 6.78)*	63 (14.9)	3.72 (2.38 to 5.81)*
<b>Uncomfortable within team</b>				
No harm	10 (8.8)	Reference	46 (7.4)	Reference
Temporary harm	26 (11.5)	1.31 (0.65 to 2.61)	82 (12.9)	1.74 (1.24 to 2.46)*
Permanent harm	54 (27.4)	3.12 (1.66 to 5.89)*	31 (16.2)	2.19 (1.43 to 3.35)*

Continued

Table 3 Continued

	Doctors (n=1619)		Nurses (n=2750)	
	Prevalence no (%)	Prevalence ratio (95% CI)	Prevalence no (%)	Prevalence ratio (95% CI)
Death	115 (27.6)	3.14 (1.70 to 5.80)*	75 (17.7)	2.41 (1.70 to 3.40)*
Difficulty sleeping				
No harm	3 (2.6)	Reference	23 (3.7)	Reference
Temporary harm	11 (4.9)	1.84 (0.52 to 6.47)	50 (7.8)	2.13 (1.31 to 3.44)*
Permanent harm	31 (15.7)	5.98 (1.87 to 19.12)*	27 (14.1)	3.82 (2.24 to 6.50)*
Death	94 (22.5)	8.57 (2.77 to 26.54)*	68 (16.1)	4.36 (2.76 to 6.88)*
Unable to provide quality care				
No harm	8 (7.0)	Reference	41 (6.6)	Reference
Temporary harm	21 (9.3)	1.32 (0.60 to 2.88)	85 (13.3)	2.03 (1.42 to 2.89)*
Permanent harm	46 (23.4)	3.33 (1.63 to 6.80)*	39 (20.3)	3.09 (2.06 to 4.65)*
Death	106 (25.4)	3.62 (1.82 to 7.21)*	95 (22.5)	3.42 (2.42 to 4.83)*

\*P<0.05.

gynaecologists showed that 60% of respondents deemed the current hospital support services after an adverse event insufficient. Two-thirds reported that their department or hospital lacked a support protocol or strategy and they were close to unanimous in preferring support from direct colleagues.<sup>23</sup>

Well-being and joy in work receive important attention nowadays in medical journals.<sup>24–28</sup> Well-being in physicians and other healthcare professionals has a direct link with patient outcomes. In general, healthcare may need to focus more on positive dimensions like work engagement and enjoy unexpected small positive experiences like *Mangomoment* a movement recently described by our department and now getting international attention.<sup>27</sup> The results of this study emphasise that the Triple Aim, a framework, that describes an approach to optimising health system performance is expanded to a Quadruple aim, meaning that next to enhancing patient experience, improving population health and reducing costs, improving the work life of healthcare providers is added to optimise health system performance.<sup>29</sup> To improve joy in work, it is now time for action by senior leaders, managers and healthcare providers alike.

The large sample size (n=6508) as well as the large number of Dutch hospitals (n=32) included strengthen this report. However, there are also some limitations. First, even though the participating hospitals vary in size, location and function, the results may not be representative for all hospitals in the Netherlands. Second, the questionnaire was distributed in several ways (by email, by intranet, by chairman of departments) and this implies that no response rate can be calculated. Third, in order to keep the questionnaire concise and little time consuming, we did not make use of extensive validated questionnaires but choose a dichotomous (present or absent) variable to record the symptoms. Last, since we rely on the

recollection and perception of the respondents the data may be subject to recollection bias.

Supporting healthcare professionals in the aftermath of a PSI is an important challenge for healthcare professionals, managers, board members and policy-makers. It should be part of the overall quality management system. For example, there should be more awareness about the emotional impact, building a professional support system and improve the notification of the available support mechanisms. This should result in better quality of care to patients and their family as only healthcare professionals who are feeling well and supported by colleagues and boards, are able to provide high quality of care. As the involved patients and family are the main victims of these serious clinical adverse events, all involved clinicians and managers should focus on the needs of these first victims. Open communication on the event and openness about the improvement initiatives should support the safety climate and overall quality of healthcare.

Future studies should focus on how organisations best embed the support of healthcare professionals involved in PSI in their vision, mission and policy regarding patient safety and quality care efforts. Specifically, longitudinal studies focusing on the duration of the symptoms may help in making the current support systems more evidence based. Future work should also include a screening method in order to individualise institutional and peer support in the aftermath of a PSI. More data are needed in order to identify which actions should be taken to reduce the duration of the symptoms for those who suffer longer than expected. We also need to understand more about the degree of well-being of those healthcare providers involved in a PSI resulting in permanent harm or death, reporting no symptoms at all.

**Table 4** Overview of symptoms persisting longer than 6 months

	Doctors (n=1619)		Nurses (n=2750)	
	Prevalence no (%)	Prevalence ratio (95% CI)	Prevalence no (%)	Prevalence ratio (95% CI)
<b>Hypervigilance</b>				
No harm	30 (15.2)	Reference	206 (22.6)	Reference
Temporary harm	52 (14.0)	0.92 (0.61 to 1.39)	206 (22.0)	0.97 (0.82 to 1.15)
Permanent harm	77 (21.2)	1.39 (0.95 to 2.05)	88 (30.0)	1.33 (1.07 to 1.64)*
Death	182 (26.5)	1.74 (1.22 to 2.47)*	191 (31.3)	1.38 (1.17 to 1.64)*
<b>Doubts about knowledge and skill</b>				
No harm	5 (2.5)	Reference	25 (2.7)	Reference
Temporary harm	19 (5.1)	2.01 (0.76 to 5.31)	52 (5.6)	2.02 (1.27 to 3.23)*
Permanent harm	47 (13.0)	5.10 (2.06 to 12.62)*	25 (8.5)	3.11 (1.81 to 5.33)*
Death	114 (16.6)	6.54 (2.71 to 15.78)*	69 (11.3)	4.12 (2.64 to 6.44)*
<b>Stress</b>				
No harm	4 (2.0)	Reference	32 (3.5)	Reference
Temporary harm	15 (4.0)	1.99 (0.67 to 5.90)	49 (5.2)	1.49 (0.96 to 2.30)
Permanent harm	29 (8.0)	3.93 (1.40 to 11.03)*	26 (8.9)	2.53 (1.53 to 4.17)*
Death	84 (12.2)	6.02 (2.24 to 16.21)*	57 (9.3)	2.66 (1.75 to 4.05)*
<b>Shame</b>				
No harm	6 (3.1)	Reference	33 (3.6)	Reference
Temporary harm	21 (5.7)	1.85 (0.76 to 4.52)	67 (7.2)	1.98 (1.32 to 2.97)*
Permanent harm	35 (9.6)	3.17 (1.36 to 7.40)*	31 (10.6)	2.92 (1.82 to 4.68)*
Death	99 (14.4)	4.73 (2.11 to 10.62)*	65 (10.7)	2.94 (1.96 to 4.42)*
<b>Flashbacks</b>				
No harm	7 (3.6)	Reference	32 (3.5)	Reference
Temporary harm	17 (4.6)	1.29 (0.54 to 3.05)	68 (7.3)	2.07 (1.37 to 3.12)*
Permanent harm	30 (8.3)	2.33 (1.04 to 5.20)*	31 (10.6)	3.01 (1.87 to 4.85)*
Death	94 (13.7)	3.85 (1.82 to 8.16)*	103 (16.9)	4.81 (3.28 to 7.05)*
<b>Fear</b>				
No harm	3 (1.5)	Reference	25 (2.7)	Reference
Temporary harm	8 (2.2)	1.41 (0.38 to 5.26)	48 (5.1)	1.87 (1.16 to 3.00)*
Permanent harm	26 (7.2)	4.70 (1.44 to 15.34)*	24 (8.2)	2.98 (1.73 to 5.14)*
Death	79 (11.5)	7.55 (2.41 to 23.66)*	62 (10.2)	3.70 (2.35 to 5.83)*
<b>Avoiding risks</b>				
No harm	1 (0.9)	Reference	13 (2.1)	Reference
Temporary harm	8 (3.5)	4.02 (0.51 to 31.73)	25 (3.9)	1.88 (0.97 to 3.64)
Permanent harm	13 (6.6)	7.52 (0.99 to 56.76)	8 (4.2)	2.00 (0.84 to 4.75)
Death	33 (7.9)	9.02 (1.25 to 65.25)*	27 (6.4)	3.06 (1.60 to 5.87)*
<b>Unhappy and dejected</b>				
No harm	2 (1.8)	Reference	3 (0.5)	Reference
Temporary harm	2 (0.9)	0.50 (0.07 to 3.52)	11 (1.7)	3.59 (1.01 to 12.79)*
Permanent harm	7 (3.6)	2.03 (0.43 to 9.59)	5 (2.6)	5.42 (1.31 to 22.46)*
Death	30 (7.2)	4.10 (0.99 to 16.90)	15 (3.6)	7.38 (2.15 to 25.32)*
<b>Uncomfortable within team</b>				
No harm	1 (0.9)	Reference	8 (1.3)	Reference
Temporary harm	7 (3.1)	3.52 (0.44 to 28.23)	21 (3.3)	2.57 (1.15 to 5.75)*
Permanent harm	10 (5.1)	5.79 (0.75 to 44.62)	10 (5.2)	4.06 (1.63 to 10.15)*

Continued

Table 4 Continued

	Doctors (n=1619)		Nurses (n=2750)	
	Prevalence no (%)	Prevalence ratio (95% CI)	Prevalence no (%)	Prevalence ratio (95% CI)
Death	36 (8.6)	9.84 (1.36 to 71.01)*	26 (6.2)	4.79 (2.19 to 10.49)*
Difficulty sleeping				
No harm	1 (0.9)	Reference	5 (0.8)	Reference
Temporary harm	2 (0.9)	1.00 (0.09 to 10.96)	13 (2.0)	2.54 (0.91 to 7.09)
Permanent harm	6 (3.1)	3.47 (0.42 to 28.48)	8 (4.2)	5.20 (1.72 to 15.71)*
Death	26 (6.2)	7.11 (0.98 to 51.82)	18 (4.3)	5.31 (1.99 to 14.19)*
Unable to provide quality care				
No harm	1 (0.9)	Reference	10 (1.6)	Reference
Temporary harm	7 (3.1)	3.52 (0.44 to 28.23)	26 (4.1)	2.54 (1.24 to 5.23)*
Permanent harm	9 (4.6)	5.21 (0.67 to 40.58)	16 (8.3)	5.20 (2.40 to 11.27)*
Death	27 (6.5)	7.38 (1.01 to 53.74)*	39 (9.2)	5.75 (2.90 to 11.40)*

\*P&lt;0.05.

## CONCLUSION

In conclusion, the majority of doctors and nurses in approximately one-third of Dutch hospitals involved in a PSI at least once during their career and who chose to participate in this study report having suffered several symptoms in the aftermath of the PSI. Some of these symptoms lasted longer than 1 month while others, for example, hypervigilance, even lasted longer than 6 months. Attention should be given to how to cope with these symptoms as they profoundly affect personal well-being, professional performance as well as teamwork-related efforts directly influencing patient safety and the provision of quality care.

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**Contributors** Conception and design of the study: KV, LS, MP and GZ. Acquisition of the data: LS, EC and GZ. Analysis and interpretation of the data: KV, DS, LB and EC. Drafting of the manuscript: DS, LS, LB, GZ and KV. All authors critically revised the manuscript for intellectual content and approved the final version.

**Funding** This study was carried out with an unconditional grant from VvAA.

**Competing interests** None declared.

**Patient consent for publication** Not required.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data sharing statement** All data relevant to the study are included in the article or uploaded as online supplementary information.

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