

# A Comparative Study Measuring the Difference of Healthcare Workers Reactions Among Those Involved in a Patient Safety Incident and Healthcare Professionals While Working During COVID-19

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**Objectives:** This study aimed to describe the differences and similarities in the reaction of the healthcare worker involved in a patient safety incident or during the COVID-19 pandemic. We also compared the differences in support they need.

**Methods:** A secondary data analysis was performed based on 2 cross-sectional survey studies. One study evaluated the impact of patient safety incidents on healthcare professionals, and the other evaluated the impact of COVID-19. Measurements on mental health reactions and an evaluation of the experienced support system were compared between 883 doctors and 1970 nurses working in different hospitals.

**Results:** Anxiety, difficulties concentrating, doubting knowledge and skills, feeling on their own, feeling unhappy and dejected, feeling uncertain in team, flashbacks, hypervigilance, sleep deprivation, stress and wanting to quit profession were statistically higher in the COVID-19–related groups. Second victims tend to speak about it with their own/close colleagues, whereas healthcare workers working during the COVID-19 pandemic talk more often to their partner and friends. Only a small number talked to a psychologist, but the number who needed to talk to a psychologist but did not is higher than the number who did talk to a psychologist or used professional support in all 5 groups.

**Conclusions:** The impact of the COVID-19 pandemic on the mental health of healthcare workers is larger than after being involved in a patient safety incident. There is the need for an adequate support system, and the mental health of all healthcare workers needs to be considered. Partners and friend play a more important role in the support experienced during the COVID-19 pandemic, and there is an important need for professional help.

**Key Words:** mental health, COVID-19, patient safety, health personnel/psychology, peer support, hospital

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According to the regulations in Dutch hospitals, the survey's instructions clearly mentioned that completing the questionnaire implied informed consent to participate. The ethical approval for the COVID study was approved by the ethical committee of the University Hospitals Leuven (S63914). Participation was entirely voluntary, and confidentiality and anonymity were guaranteed at all times.

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The COVID-19 pandemic has put pressure on the entire healthcare system and also has exerted a negative impact on the mental health of healthcare professionals.<sup>1–4</sup> The pandemic is associated with long shifts and high-intensity work, and the healthcare staff is at an increased risk of infection.<sup>5,6</sup> To address the surge of COVID-19–positive patients, many healthcare workers have been redeployed to areas outside their clinical expertise, counting on their flexibility.<sup>7</sup> Supporting these healthcare professionals through existing support systems, developed for healthcare professionals involved in an adverse event, is suggested in previous research.<sup>1,8</sup> An adverse event, defined as “an unintended or unexpected incident which causes harm to a patient and may lead to temporary or permanent disability,” occurs in approximately 1 of 10 hospitalized patients<sup>9,10</sup> and is referred to with the term “patient safety incident” (PSI). When a PSI occurs, there can be 3 types of victims: the first victim (the patient and the family), second victim (the healthcare professional(s) involved), and third victim (the organization).<sup>11,12</sup> Research concerning second victims showed that involvement in a PSI can have a broad impact on the healthcare worker's professional and his/her personal life. They can suffer from several symptoms, such as hypervigilance, anxiety, stress, and so on, which can last for months.<sup>13</sup> The prevalence ratio of these symptoms increases when the PSI has a higher degree of harm. The overall impact remains underestimated, and the need for an adequate support system to help healthcare workers in the aftermath of a PSI is still an important challenge for healthcare organizations.<sup>14</sup>

The aim of this study is to understand the differences and similarities in the reaction of the healthcare professionals involved in a PSI and the reaction of the healthcare professional during the COVID-19 pandemic. The following research questions will be addressed: (1) Do healthcare workers react differently during the current pandemic than when being involved in a PSI? (2) Is there a difference between healthcare workers who are working with COVID-19–positive patients and those who do not? and (3) Are healthcare workers working during the COVID-19 pandemic in need of the same support as second victims?

## METHODS

### Data Collection

We used data from 2 previous studies concerning the mental health of second victims and healthcare workers during the COVID-19 pandemic. The second victim study was conducted between April 2016 and November 2018 as a multicenter survey involving nurses and doctors working in direct patient contact in 32 hospitals in the Netherlands, involved in a PSI at any time during their career.<sup>13</sup> The data concerning the mental health of healthcare workers during the COVID-19 pandemic were collected in Flanders as a multicenter survey during the first

lockdown between April and June 2020 involving paramedics, nurses, doctors, and management staff.<sup>1</sup>

**Measurements**

The questionnaire used in the COVID-19 study was based on the instrument used in the second victim study.<sup>1,13</sup> A different scoring system was used in both studies. We included measurements on potential symptoms or reactions to the stressful exposure and an evaluation of the experienced support studied in both surveys. The symptoms or reactions studied in both surveys were as follows: anxiety, difficulties concentrating, doubting knowledge and skills, feeling on their own, feeling unhappy and dejected, feeling uncertain in team, flashbacks, hypervigilance, sleep deprivation, stress, and wanting to quit profession. Response categories for the duration of the symptoms in the second victim study were as follows: “none/some hours/a day/a week/a month/2–6 months/6–12 months and more than a year.” In the COVID-19 study, these symptoms were scored from 0 to 10, with “never experienced” (score 0) and “experienced always during past week” (score 10). The sources of support measured in both studies were as follows: own superior, own/close colleagues, general practitioner, psychologist/professional support, partner, and friends. The answer categories were as follows: needed to, talked to and this was a positive experience, did not talk to and did not need to, did not talk to but needed to, and talked to and this was a negative experience.

**Participants**

The participants of this comparative study were doctors and nurses working in a hospital environment. We excluded paramedics and management staff from the COVID-19 study. Based on previous research, 5 different groups were made: (1) second victims involved in a PSI with mild harm (no harm and temporary harm), (2) second victims involved in a PSI with severe harm (permanent harm and death), (3) healthcare workers who had no direct contact with COVID-19–infected patients, (4) healthcare workers who had direct contact with COVID-19–infected patients and did not work on a COVID ward, and (5) healthcare workers who had direct contact with COVID-19–infected patients and worked on a COVID ward.<sup>5,13,15</sup>

**Statistics**

Only complete questionnaires were included in the analysis. The presence or absence of mental health symptoms is represented in prevalence rates. We converted the data collected from the existing database into a binary code: 0 when the symptom

was absent and 1 when the symptom was present (some hours/a day/a week/a month/2–6 months/6–12 months and more than a year) in the second victim study.<sup>13</sup> In the COVID-19 study, the code were 0 when the symptom was never experienced and 1 when they experienced the symptom was present. The total numbers and percentages are presented in Table 2.

Next, a binary logit model was performed, controlling for age, sex, and professional group, to estimate the association between the 5 groups (second victim and COVID-19) and mental health symptoms. Bonferroni correction was used to correct for multiple testing. Finally, we described the degree to which nurses and doctors relied on sources of support and how they experienced them.

**RESULTS**

**Demographic Information**

We used data from 883 doctors and 1970 nurses involved in a PSI. In the COVID groups, we included data from 294 doctors and 1365 nurses. Table 1 summarizes the demographic information of the 5 different groups (professional group, sex, and age).

**Symptoms**

Table 2 shows the prevalence of the mental health symptoms in the 5 different groups. The prevalence of all the symptoms was higher in the COVID groups when compared with both second victim groups, and this was a statistically significant difference for all of them. Anxiety, doubting knowledge and skills, flashbacks, hypervigilance, and stress were the 5 symptoms with the highest prevalence in the second victim groups, ranging from 38% to 82%. The 5 symptoms with the highest prevalence in the COVID groups are anxiety, doubting knowledge and skills, hypervigilance, sleep deprivation, and stress, ranging from 86% to 99%.

**Sources of Support**

Figure 1 shows the different sources of support. Second victims often talk about the incident with their own/close colleagues, and more than 85% thought this was a positive experience. This number is lower in the COVID groups, with percentages ranging from 72% to 78%. Doctors and nurses working during the COVID-19 pandemic talked more often with their partner, when compared with second victims. In the COVID groups, these percentages were 80.0%, 76.4%, and 79.4% versus 58.1% and 72.5% in the second victim groups. The same accounts for talking to friends about it. Only a small percentage of the 5 groups talked about it

**TABLE 1. Demographic Information**

|                             | SV: No and Mild Harm | SV: Severe Harm and Death | No COVID Contact and No COVID Ward | COVID Contact and No COVID Ward | COVID Contact and COVID Ward |
|-----------------------------|----------------------|---------------------------|------------------------------------|---------------------------------|------------------------------|
| <b>Professional group</b>   |                      |                           |                                    |                                 |                              |
| Doctors                     | 316 (19.1%)          | 567 (47.4%)               | 101 (19.8%)                        | 116 (16.3%)                     | 77 (17.5%)                   |
| Nurses                      | 1341 (80.9%)         | 629 (52.6%)               | 408 (80.2%)                        | 595 (83.7%)                     | 362 (82.5%)                  |
| <b>Sex (male/female)</b>    |                      |                           |                                    |                                 |                              |
| Doctors                     | 112/204              | 286/281                   | 19/82                              | 35/81                           | 22/55                        |
| Nurses                      | 170/1171             | 113/516                   | 58/363                             | 66/529                          | 45/304                       |
| <b>Age, average ± SD, y</b> |                      |                           |                                    |                                 |                              |
| Doctors                     | 38.3 ± 8.0           | 40.9 ± 8.6                | 42.4 ± 8.9                         | 41.7 ± 10.4                     | 36.9 ± 10.1                  |
| Nurses                      | 39.0 ± 11.7          | 41.1 ± 12.0               | 44.1 ± 10.4                        | 42.5 ± 11.0                     | 40.2 ± 10.6                  |

SV, second victim.

**TABLE 2.** Total Number and Percentage of Presence of Symptoms (Model Corrected for Age, Sex, and Profession)

|                               | SV: No and Mild Harm | SV: Severe Harm and Death | No COVID Contact and No COVID Ward | COVID Contact and No COVID Ward | COVID Contact and COVID Ward | Significant Difference    |
|-------------------------------|----------------------|---------------------------|------------------------------------|---------------------------------|------------------------------|---------------------------|
| Anxiety                       | 869 (52.4%)          | 627 (52.4%)               | 437 (85.9%)                        | 661 (93.0%)                     | 399 (91.0%)                  | B, C, D, E, F, G, H       |
| Difficulties concentrating    | 338 (20.4%)          | 409 (34.2%)               | 434 (85.3%)                        | 646 (90.9%)                     | 393 (89.5%)                  | A, B, C, D, E, F, G, H    |
| Doubting knowledge and skills | 887 (53.5%)          | 773 (64.6%)               | 468 (91.9%)                        | 664 (93.4%)                     | 405 (92.3%)                  | A, B, C, D, E, F, G       |
| Feeling on their own          | 309 (18.7%)          | 400 (33.4%)               | 417 (81.9%)                        | 621 (87.3%)                     | 362 (82.5%)                  | A, B, C, D, E, F, G       |
| Feeling uncertain in team     | 621 (37.5%)          | 517 (43.2%)               | 394 (77.4%)                        | 585 (82.3%)                     | 355 (80.9%)                  | B, C, D, E, F, G          |
| Feeling unhappy and dejected  | 518 (31.3%)          | 582 (48.7%)               | 405 (79.6%)                        | 622 (87.5%)                     | 389 (88.6%)                  | A, B, C, D, E, F, G, H, I |
| Flashbacks                    | 641 (38.7%)          | 661 (55.3%)               | 404 (79.4%)                        | 606 (85.2%)                     | 381 (86.8%)                  | A, B, C, D, E, F, G, H, I |
| Hypervigilance                | 1352 (81.6%)         | 967 (80.9%)               | 476 (93.5%)                        | 691 (97.2%)                     | 420 (95.7%)                  | B, C, D, E, F, G, H       |
| Sleep deprivation             | 518 (31.3%)          | 586 (49.0%)               | 460 (90.4%)                        | 683 (96.1%)                     | 417 (95.0%)                  | A, B, C, D, E, F, G, H, I |
| Stress                        | 794 (47.9%)          | 759 (63.5%)               | 493 (96.9%)                        | 703 (98.9%)                     | 430 (98.0%)                  | A, B, C, D, E, F, G       |
| Wanting to quit profession    | 166 (10.0%)          | 235 (19.7%)               | 315 (61.9%)                        | 476 (67.0%)                     | 292 (66.5%)                  | A, B, C, D, E, F, G       |

Significant difference at  $P < 0.0045$  after Bonferroni correction.

A = SV: no and mild harm versus SV: severe harm and death. B = SV: no and mild harm versus no COVID contact and no COVID ward. C = SV no and mild harm versus COVID contact and no COVID ward. D = SV no and mild harm versus COVID contact and COVID ward. E = SV: severe harm and death versus no COVID contact and no COVID ward. F = SV: severe harm and death versus COVID contact and no COVID ward. G = SV: severe harm and death versus COVID contact and COVID ward. H = No COVID contact and no COVID ward versus COVID contact and no COVID ward. I = No COVID contact and no COVID ward versus COVID contact and COVID ward. J = COVID contact and no COVID ward versus COVID contact and COVID ward.

SV, second victim.

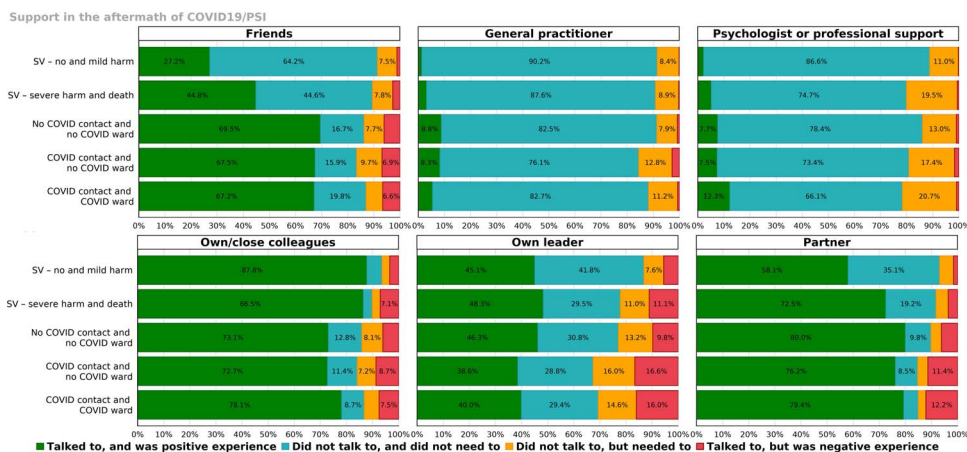
with a psychologist or used professional support, ranging from 1% to 13%. The number who did not talk to a psychologist but needed to is higher than the number who did talk to a psychologist or used professional support in all 5 groups, ranging from 11% to 20.7%.

### DISCUSSION

Healthcare workers involved in an adverse event can experience different negative mental health symptoms such as anxiety, doubting knowledge and skills, flashbacks, hypervigilance, and stress. However, the impact of the current pandemic seemed much more severe compared with the impact of a single adverse event

(Table 2). When we compare the 5 symptoms with the highest prevalence in both surveys, 4 of them are the same. Thus, the reaction of the healthcare workers involved in PSI and the reaction of the healthcare worker working during the COVID-19 pandemic are similar.

All mental health symptoms surveyed in this study were statistically significantly more prevalent in the different COVID groups when compared with second victims. There are clear differences between the prevalence ratio of the symptoms in the second victim groups, ranging from 10% to 81.6%. In the COVID groups, all the prevalence ratios are higher than 66%, demonstrating an immense impact on all health care workers, also on those who do not work with COVID-19-positive patients. This is a clear difference when



**FIGURE 1.** Sources of support.

comparing with the reaction of second victims and gives us an answer to our second research question. Because of the high transmission rate of the virus and the lack of any vaccine or medicine, infection's control was a serious challenge.<sup>2</sup> The lack of protective equipment and the absence of professional knowledge about exposure patterns and transmission rates increased the feeling of uncertainty, especially in teams not working in direct contact with COVID-19-positive patients.<sup>3</sup> The bigger impact of COVID-19 on mental health might be related to the long-term nature of the stressor. In general, the human stress system is more suited to cope with a single major stressor than with an extended period of stressful unpredictability. The COVID-19 pandemic is a chronic, stressful period for healthcare workers and has an impact on 2 fronts: work environment and home.<sup>16</sup> Previous research taught us that the symptoms second victims experience can last for several months and that organizations should provide supportive interventions.<sup>13,14,17</sup> This study shows us that the need for supportive interventions to help healthcare professionals working during the COVID-19 pandemic is even bigger. These interventions will probably be needed for a very long time in the aftermath of the current pandemic. Our study only included questionnaires from the first lockdown. Further research is necessary to see how large the impact of the second and third lockdowns will have been on the mental health of healthcare workers and in the aftermath of this pandemic.

We do not know which specific support was lacking and leads to greater distress. Working conditions can often make the difference for a better patient outcome as well as for worker satisfaction. These working conditions can include staffing, personnel protective equipment, environmental controls, infection control measures, and post-incident debriefing and counseling. There is a greater need for more investigations and research to further evidence the necessary physical and psychological tools of support for health care workers to perform the truly important work they do in the respectful environments they practice.

Second victims seek support by talking to their own/close colleagues, whereas healthcare professionals working during the COVID-19 pandemic talk more often with their partner and friends. "Second victims are often afraid to talk about the event. One of the reasons is the punitive culture of the medical field in which the acknowledgment of mistakes is taboo."<sup>18</sup> This might explain why they feel ashamed and are less likely to talk about it with their partner and friends, who do not really understand their work environment. The COVID-19 pandemic, on the other hand, is worldwide news and has everyone's attention. People are not afraid to talk about it, and everyone is informed about the seriousness of the situation. That could explain why healthcare workers confronted with the COVID-19 pandemic seek more support from their partner and friends. The COVID-19 pandemic also has a negative impact on everyone's personal life: healthcare workers are more exhausted and often have to work long hours. Their partner often has to work from home and/or is confronted with the care-taking of their children. This makes it often necessary to talk about the COVID-19 pandemic at home.

Healthcare professionals working on a COVID ward seek support more often with their own/close colleagues than those who do not work on a COVID ward. Hospitals had to reorganize to deal with the needs of citizenship. Deferrable activities were suspended, and hospitals rapidly had to reconfigure clinical spaces and restructure clinical teams.<sup>13,19,20</sup> Teams working with COVID-19-infected patients have been referred to as heroes, and these healthcare professionals, working in the frontline, more often sought support with each other. However, it is also important to recognize the work of the healthcare workers behind the scene.<sup>21</sup> They are also confronted with important changes of their work environment and are exposed to an increased risk of infection. They are less likely to seek support

with their colleagues, possibly because they feel less appreciated or supported. Our data also show that if healthcare workers were in contact with COVID-19 patients, an important percentage of respondents reported "talked to, but was negative experience" with own leader and partner (Fig. 1). This might be because of the fear of the community early in the pandemic and possible avoidance of healthcare workers because they might be a source of infection. This shunning of COVID-19 workers remains a widespread and underrecognized problem. Previous research shows that this is part of a broader tendency to overestimate health risks in general.<sup>22</sup> More than 10% of both second victims and healthcare professionals working during the COVID-19 pandemic reported the need to talk to a psychologist but did not do it. This indicates that there still is an important barrier to seek for mental healthcare. Fear, uncertainty, and stigmatization often are responsible for this barrier. Because the effective and permanent presence of healthcare workers is needed now more than ever in our society, we must pay attention to their needs.<sup>23</sup> Further research is necessary to help the healthcare professional to overcome this barrier. To answer our last research question, there are some important differences and similarities in the experienced support system between second victims and healthcare workers working during the COVID-19 pandemic. Family and friends play a more important role during the COVID-19 pandemic, and there is an important percentage of both second victims and healthcare workers working during COVID-19 pandemic who experience the need to talk to a psychologist/professional help but did not do it.

## Strengths and Limitations

This is the first study comparing the mental health of the healthcare workers after an adverse event with healthcare workers during the COVID-19 pandemic.

This study has several limitations. First of all, to compare the symptoms between the different groups, we had to transform the responses from the questionnaires used in both studies into binary outcomes. This could lead to exaggerating the positive symptoms, because it makes ordinal responses have the same values. There is no information available about the timing of the adverse event, which could give an underestimation of the prevalence ratio because of recall bias. There could also be a ceiling effect because the participants' scores cluster toward the high end of the measurement. It was not possible to give response rates because of the way both questionnaires were distributed. We cannot reliably estimate the number of healthcare professionals who have received and read the invitation to participate in the studies. Both studies were conducted in different countries (the Netherlands and Belgium), so there could be a cultural bias, especially for the second part of this study because there are known differences between the openness and talking about feelings between both countries.

## CONCLUSIONS

The COVID-19 pandemic has a negative influence on the mental health of the entire healthcare system, which is much more severe than after a PSI. Those who do not work in immediate proximity of COVID-19 patients also are heavily affected by this and should not be forgotten. Healthcare professionals working during the COVID-19 pandemic rely more on their partner and friends than second victims, but there is also an important need for professional help. Unfortunately, there still seems to be a barrier to accept this help.

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