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PHYSICIANS' SENSE OF RESPONSIBILITY DURING THE COVID-19 PANDEMIC: A BINARY LOGISTIC MODEL

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Abstract: *Introduction.* During a pandemic, doctors are or are not willing to work due to numerous factors. Studies have shown that doctors tend to prioritize their own safety and the safety of their families.

Objective. We have built a profile for doctors who prioritize their own safety and the safety of their families during a pandemic.

Method. A total of 1285 Romanian doctors completed an online survey belonging to a larger study. We used a logistical binary regression to build a profile for doctors who consider their own safety and the safety of their families as having priority. All the participants responded, among other things, to an item about responsibility. We performed Backward-Wald computations to determine the best predictors.

Results. We reached seven predictors that could differentiate between respondents who tended to agree with the responsibility statement and those who tended to disagree. The Cox and Snell pseudo R2 coefficient were .11. The predictors referred to: leaving the job to protect family, transportation, new job responsibilities, necessity of wage, needing to contribute, abandoning patients and working in a different hospital.

Conclusion. The results show that doctors are not necessarily aligned with the theoretical "duty to care". Those who prioritize safety for themselves and for their families seem to feel strongly about a hierarchy of values they have. For these doctors, institutional responsibility might take precedence with respect to patients, so they do not feel a sense of abandoning their patients if they don't show up to work.

Keywords: responsibility, duty to care, willingness to work.

INTRODUCTION

In the event of a disaster, but especially in the event of a pandemic, the public expects medical personnel to keep working for the welfare of patients and their protection. In general, health care professionals do have the same expectation with respect to themselves as well as the other doctors or nurses. In a worldwide event such as the COVID-19 pandemic, health care professionals, especially those found on the front line, must deal with two main ethical problems. On one hand, is there a duty to respond despite the obvious risks? On the other hand, how should vital medical resources be distributed when they become scarce? Despite being able to provide a personal answer to the first question, professionals often have too little control over situations where decisions regarding resource allocation need to be made. Most countries didn't prepare early enough during the COVID-19 pandemic, to produce an effective response [1].

As we noted, at the outset of such a pandemic, the most important ethical decision in the war against the virus is one under the control of the individual: Will they participate in the efforts against the pandemic, or will they abandon the battle? Most plans for epidemics and other disasters depend on doctors, nurses and support staff to maintain the front line of medical care. However, it is next to absurd to assume that all health workers will automatically respond [1]. For instance, a study in pediatrics showed that unconditional willingness to work was lower in nuclear situations and much higher during a pandemic, but never close to one hundred percent. The participants in that study considered special training, the knowledge of

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an antidote, use of protective equipment and self-estimated capability as important predictors for a higher willingness to work [2].

The decisions made by professionals are mostly a combination of values, responsibilities towards their own family and community, concerns over financial stability and health risks. After all, no medical professional is truly obligated to urgently respond to life-threatening situations. Professional codes of ethics are not an absolute, even though they might be very well grounded in ethical theory. Therefore, medical professionals respond for various reasons. The question that arises is how these factors can be known and modified to elicit better responses from healthcare workers [1].

The principle of putting patients' needs first gets put to the test as doctors and nurses decide whether to stay and fulfill their commitment or avoid increasing risks for themselves and for their own families. The "duty to care" value is by no means an absolute when one's life is at risk. In a situation such as this, each person might want to prioritize their own values. Realistically, most health care professionals will first assess the risks for their safety and their own families [1]. For instance, a study showed that providing protection for the family was the greatest motivator when it comes to a willingness to work during a pandemic [3]. Most physicians and nurses focus on professional factors like taking the same risks as colleagues, peer pressure and the consequences of refusing to participate in the fight against the virus, a desire to contribute to the common well-being, not betraying public trust, and so on [1]. Moreover, other concerns affecting willingness to work during a pandemic have been identified in appreciation from the employers, side effects and efficacy of vaccination, frequent policy changes, confusing criteria of case management and duty role stress [4].

It is usually thought that doctors, in their role as professionals, are more rational than emotional. However, emotions in medicine can sometimes overwhelm rationality [5]. Therefore, when preparing for a pandemic, decision makers should ask themselves what truly makes healthcare professionals likely to respond in a desirable way. This is so because people decide acceptability of risks, for themselves and for others, based on the information they receive, on emotions and based on cognitive shortcuts [1]. Worries about personal safety, about safety of family, but also family's concern for safety, and childcare issues remain important barriers when it comes to working during a pandemic [6,7]. Rash and emotional reactions often precede and, unfortunately, influence "rational" assessments. It is often the same case with the general public. For instance, public perception of the risk posed by COVID-19 has long been at odds with reality. This was partly due to discordant messages from the authorities [1].

Without accurate, relevant and credible information, all personnel needed to operate health care facilities may not respond, and the quality of health care available may deteriorate. Wide dissemination of descriptions of staff protection measures encourages but does not guarantee the maximum number of physicians and other staff needed to produce an effective response[1]. Interestingly, in a study, two thirds of the nursing students stated they were willing to volunteer in the event of a pandemic if they were able to do so. An even greater number said they would volunteer if protective garments were provided. Overall seventy percent of students supported the statement that nursing students have a professional obligation to volunteer during a pandemic [8]. Managers should put the effort into clearly communicating the risks to all members of the health care system but also into considering other factors [1]. For instance, several studies showed that hospital support personnel is less likely to report a willingness to work during a pandemic rather than clinical healthcare professionals [6, 9]. Properly communicating the risks can help keep health care workers and other essential workers on the job, the latter being very important as well. But this type of communication needs to be done by knowledgeable individuals trained in risk communication techniques, in a manner that elicits trust. Besides information that directly targets protective measures and risks, managers and leaders should give the same importance to other concerns that may prevent professionals from working during a disaster. This can include public transportation to and from the institution, distance [3], the welfare of children left at home [10], the availability of domestic help and so on [1].

A pandemic is an international problem. It requires worldwide collaboration. Pandemics, therefore, engender collective responsibilities. One important division is between the "personal responsibility" of individuals and the "institutional responsibility" of governments. It is obvious that institutional responsibility for a problem does not completely exclude personal responsibility. In a democracy, some elements of institutional responsibility are, at least indirectly, in the hands of the public, and each citizen may have responsibilities to vote and put pressure on

the political factor to get better institutional responses. But in the short term, when we face a problem like COVID-19, this kind of control that citizens have over their governments is, in fact, much more limited. However, one last clarification of "institutional responsibility" is needed. Institutions are made up of a multitude of individuals, and they interact with each other. The question arises as to whether institutional responsibility can be reduced to the responsibilities of individuals or whether we can hold institutions accountable [11]. By taking into consideration these two facets, we can extrapolate how medical doctors and nurses can feel responsibility individually or as parts of a larger structure.

Another key element is the psychological welfare. The pandemic has brought challenges to the psychological well-being of many people. In addition to the mental health impact of isolating individuals in the general population, the effect on the mental health of health professionals has become increasingly evident as well. Healthcare professionals have worked hard to provide the best healthcare for patients during the COVID-19 pandemic. However, after long shifts, doctors often complained that they were not able to implement safe practices. It was also difficult to talk about good practices, at least in the early stages of the pandemic. Without proper protective equipment, healthcare professionals, because of exhaustion and the inability to take responsibility for successful patient care, felt helpless against COVID-19 [5]. This subjective feeling of helplessness can easily translate into stress for the medical staff which, in turn, can affect a willingness to work and assuming responsibility.

Most medical professionals would take responsibility towards their own safety and towards the safety of their own family as a starting point in judging the risks and a willingness to work during a pandemic. Therefore, we used this idea to explore what makes doctors consider their responsibility as being directed with priority towards self as well as their own family. This would show us more about the intrinsic mechanisms of manifesting professional responsibility as a (second) priority.

METHOD

In this study, we used a logistical binary regression to build a profile for doctors who consider their own safety and the safety of their families as having priority. A total of 1285 Romanian doctors completed an online survey belonging to a larger study pertaining to responsibility, medical ethics, a willingness to work and self-efficacy during the first wave of the COVID-19 pandemic. Out of the total, 982 responders were females and 302 were males with one participant not specifying their gender. The mean age of the sample was 48.21 years with a minimum of 25 and a maximum of 86. The participants belonged to all known specialties in the field of medicine.

The participants were asked to respond to socio-demographic questions like age, number of members in the household etc. Questions about the medical specialty, years of practice, age and number of siblings were included. They also had to respond to statements for which they had to choose on a six-point scale ranging from 1 – totally disagree to 6 – totally agree. This scale was chosen to avoid the central tendency bias in responses. All the 1285 participants responded to the main item about responsibility "My main responsibility is towards myself and my family". The mean score for this scale in the whole sample was 4.62 with a minimum of 1 and a maximum of 6. The median score of the scale was 5. To distinguish between the two groups, one tending to agree to this statement and one tending to disagree to this statement, we used the median and recoded a new binary variable. Scores of 5 and higher (median and above) where coded as "tends to agree" and scores under 5 were coded "tends to disagree". The frequency for the two modalities of the variable were 521 (40.5%) of the respondents who tended to disagree and 764 (59.5%) of the respondents who tended to agree.

Using the new dichotomic variable as dependent variable for a binary logistic regression, we performed Backward-Wald computations to determine the best predictors for the two categories of responses. We reached seven predictors that could differentiate between respondents who tended to agree with the responsibility statement and those who tended to disagree with the same statement. The Cox and Snell pseudo R2 coefficient was 0.11, indicating a modest correspondence between the model and the real data. The model was more exact with respect to those who tended to agree (89%) than with those who disagreed (34%).

RESULTS

In this study, we used a logistical binary regression model to build a profile for doctors who consider their own safety and the safety of their families as having priority. The binary logistic regression model

can show us several items. The responses to these items tend to predict an agreement with the item "My main responsibility is towards myself and my family". This way of analyzing data can give us a profile of the person who tends to agree with the above item. A Backward-Wald computation eliminates insignificant predictors and keeps only those variables which can participate in the binary logistic model. Therefore, our results can give us insight into the way of thinking of the doctor who tends to consider their own safety and the safety of their own family first, in contrast with those who would rather not place their own safety and the safety of their own family as a top priority.

In the survey, the responders who agreed with the statement: "My main responsibility is towards myself and my family" also tended to agree with the following statements:

- It would have been acceptable for medical staff to leave their jobs during the pandemic, in order to protect themselves and their families.

- It was easy for me to safely use means of transportation to work during the pandemic.

- I was willing to work during the pandemic even though I was asked to take on responsibilities for which I am not prepared.

- I had to work because I relied on my wage.

The responders who agreed with the statement "My main responsibility is towards myself and my family" tended also to disagree with the following statements:

- It would have been more frustrating for me to stay home and not be able to work, knowing that I could contribute.

- Not coming to work during a pandemic means abandoning one's patients.

- I was willing to work during the pandemic even though I was asked to work in a different hospital or place than what I normally do.

Table 1 depicts each item along with the beta coefficient, the standard deviation and the Wald coefficient in the final model of the logistic binary prediction.

DISCUSSION

In this study, we used a logistical binary regression model to build a profile for doctors who consider their own safety and the safety of their families as having priority. First, doctors who placed the responsibility for own safety and their own family first also tended to agree that it would have been acceptable for medical staff to leave their jobs during the pandemic, in order to protect themselves and their families. This empirically confirms the theoretical literature which states that no automatic willingness to work is present for doctors during a pandemic. There is no absolute power of the codes of ethics in such circumstances. When put to the test, the "duty to care" principle does not translate into practice for those who consider their own safety or the safety of their own families as having priority [1]. This result also supports findings about the fact that family safety is one of the greatest motivators to work in pandemics [4, 6, 7]. The result obviously shows that a cold ethical principle is not enough to overcome emotions as previously shown in studies pertaining to doctor's burnout [5].

Doctors who prioritized their own safety and the safety of their own family also felt it was easy to use transportation to work and from work. This result apparently contradicts the importance of transportation regarding willingness to work which is emphasized in

Table 1. Items with power of significant prediction in the binary logistic regression model

Item in the general Questionnaire	B coefficient	Standard Deviation	Wald	Sig.
It would have been acceptable for medical staff to leave their jobs during the pandemic, in order to protect themselves and their families (Item 38).	0.22	0.08	7.62	0.006
It was easy for me to safely use means of transportation to work during the pandemic (Item 56).	0.15	0.07	4.33	0.037
It would have been more frustrating for me to stay home and not be able to work, knowing that I could contribute (Item 60).	-0.20	0.10	4.05	0.044
Not coming to work during a pandemic means abandoning one's patients (Item 71).	-0.20	0.09	4.99	0.025
I was willing to work during the pandemic even though I was asked to take on responsibilities for which I am not prepared (Item 73).	0.27	0.10	7.77	0.005
I was willing to work during the pandemic even though I was asked to work in a different hospital or place than what I normally do (Item 79).	-0.18	0.08	5.41	0.020
I had to work because I relied on my wage (Item 93).	0.24	0.07	10.97	0.01
Constant	0.26	0.66	0.15	.695

some studies [3]. However, this result might be due to a practical fact that the participants in the study who prioritize safety for themselves and their families most probably tend to own a personal car even before the pandemic. This would explain why this item became a significant predictor even in the situation where other predictors (like the number of children in the household or number of elderly persons) did not reach significance and did not fit in the predictive model.

Doctors valuing most personal and family safety tended to state that they were willing to work during the pandemic even though they were asked to take on responsibilities for which they were not prepared. This result seems to be inconsistent with what was previously shown in literature. A willingness to work was shown to be negatively influenced by role stress and frequent policy changes [4]. However, the association between prioritizing their own (family's) safety and willingness to take on new responsibilities might be due to other factors. We can only hypothesize the fact that doctors who strongly supported the priority of their own (family's) safety have a stronger attachment to their own values in general. This is consistent with Iserson's emphasis on the fact that the decisions professionals make are mostly a combination of values, responsibilities and concerns [1]. A possible explanation is that these doctors have stronger feelings toward their own system of values.

Finally, doctors who agreed that own (family's) safety takes precedence also agreed that they had to work because they relied on their wage. The most logical interpretation for this result resides in the fact that financial stability is a key element in family safety. The result is, obviously, consistent with previous findings that emphasized how important the welfare of children left at home was [10], but also with studies concerning the importance of family [6, 7].

There are three items that served as negative predictors for a positive response from the doctors concerning their own safety. In other words, the responders who agreed to the statement "My main responsibility is towards myself and my family" tended also to disagree with several items included in the general questionnaire. First, doctors who prioritized their own (family's) safety would not consider it more frustrating to stay at home and not be able to work, knowing that they could contribute. We hypothesize that this item shows a clear hierarchy of values. Those who feel that their own and family's safety is paramount tend to not feel frustration when they deal with a choice in values. In the opinion of this article's authors, there is no frustration in this case, because there is no inner psychological conflict. People who clearly value their own safety and the safety of their loved ones over their professional responsibilities are not in a state of ambivalence or psychological corundum. Again, this confirms that not all health care workers will automatically respond [1]. In our view this is, paradoxically, a more rational type of response from the part of the doctor who considers their own values [5].

Interestingly, the same doctors tend not to consider the absence from work as meaning an abandonment of their patients. In short, when prioritizing their own (family's) safety during a pandemic, absence from work is not considered as violating a moral code. In our view, this clearly shows that different doctors have different hierarchies of values. There is not a problem of abandonment of patients because, otherwise, it would be a problem of abandonment of one's own family, which takes priority. We can hypothesize that this item might be interpreted considering the distinction between personal and institutional responsibility. When a doctor's safety is not assured and the family is not protected either, physicians who prioritize their own safety might feel that the patient's welfare becomes an institutional responsibility which goes beyond the sum of the individuals composing it. The relationship we show in this study might discretely illustrate that institutional responsibility comes before individual responsibility, at least in the opinion of doctors who prioritize their own safety and the safety of their family [11].

Finally, doctors who prioritize their own safety and the safety of their family tend not to be willing to work during the pandemic if they are asked to work in a different hospital or place than what they normally would. First, logical interpretation would be that moving to another institution would make it difficult for doctors to protect their own families. Distance was shown as an important factor in the willingness to work [3]. This can be interpreted as a two-fold difficulty, one pertaining to the effort doctors must put in, the other about how easy it is to ensure safety when longer distances are considered. Another possible explanation is that switching to another institution might mean more policy changes and more role stress, factors which were also previously found as lowering a willingness to work [4]. One extra explanation would be that changing the hospital or place would simply entail more stress and easier burnout. This stress would be even more significant for a doctor who prioritizes the safety of their own family [5].

Despite the large number of respondents, there are some limitations in this study. First, the Cox and Snell pseudo R2 coefficient were .11, indicating a modest correspondence between the model and the real data. This means that our findings can mainly serve as indicators of tendencies and not as clear-cut differences among categories of people. Secondly, the model was more exact with respect to those who tended to agree than with those who disagreed with the statement about their own safety and the safety of their families. This further supports the idea that our findings serve as indicators for further hypothesis and not necessarily as hardcore differentiations. One limitation might reside in the way the criterion variable was defined. A further study could improve data by separating between two items, one pertaining to one's own safety and one pertaining to the safety of one's family. The profile obtained through a logistical binary model might be different, as a doctor might put more value on the safety of their own families over their own. Setting these limitations aside, the study operated with a large number of observations and used a safer way to compute data against false positives, often noticed in parametric statistical analysis.

In conclusion, in this study, we used a logistical binary regression model to build a profile for doctors who consider their own safety and the safety of their families as having priority. The results support the difference between a theoretical absolute "duty to care" and de facto reasoning as well as the feelings of doctors during a pandemic. Ethical principles are not enough to overcome emotions, especially when loved ones are involved. The results also tend to show that doctors in this profile might be prudent in general and that they feel strongly about a hierarchy of values they have. Their moral reasoning, when weighing their own safety and the safety of their own family with patient's welfare, might be quite rational. Moreover, the results might suggest that doctors in this profile feel that institutional responsibility takes precedence. They might not feel they abandoned their patients since it is not in their duty to abandon their families.

Conflict of interest

The authors declare that they have no conflict of interest.

Acknowledgment

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