Marginalization towards healthcare personnel during the COVID-19 pandemic in Mexico

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Two studies explore possible psychological factors to explain the disposition to marginalize healthcare personnel (HP) in Mexico during the COVID-19 pandemic. In study one, 520 participants responded to three instruments that measure the disposition to marginalization, the perceived contagion risk, and the positive beliefs towards HP. Results showed a generalized low disposition to marginalization, where only a small percentage obtained high scores. A regression analysis identified that marginalization towards HP can derive mainly from the perception of risk of contagion, although positive beliefs of HP decrease this disposition. The second study extends this finding by analyzing responses of 286 participants to 7 instruments measuring factors hypothesized as predictors towards marginalization: uncertainty generated by the pandemic, selfish strategies to face off the pandemic, social capital, trust in institutions, perceived vulnerability of contagion, perceived risk of contagion, and positive beliefs towards HP. A path analysis reveals that the main predictor of marginalization is the perceived risk of contagion, increased by the strategy of selfishness, and the uncertainty generated by the pandemic. These results are discussed emphasizing the importance of cooperation and community ties to prevent marginalization of HP in the context of sanitary emergencies generated by contagious diseases.

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Abstract

Two studies explore possible psychological factors to explain the disposition to marginalize healthcare personnel (HP) in Mexico during the COVID-19 pandemic. In study one, 520 participants responded to three instruments that measure the disposition to marginalization, the perceived contagion risk, and the positive beliefs towards HP. Results showed a generalized low disposition to marginalization, where only a small percentage obtained high scores. A regression analysis identified that marginalization towards HP can derive mainly from the perception of risk of contagion, although positive beliefs of HP decrease this disposition. The second study extends this finding by analyzing responses of 286 participants to 7 instruments measuring factors hypothesized as predictors towards marginalization: uncertainty generated by the pandemic, selfish strategies to face off the pandemic, social capital, trust in institutions, perceived vulnerability of contagion, perceived risk of contagion, and positive beliefs towards HP. A path analysis reveals that the main predictor of marginalization is the perceived risk of contagion, increased by the strategy of selfishness, and the uncertainty generated by the pandemic. These results are discussed emphasizing the importance of cooperation and community ties to prevent marginalization of HP in the context of sanitary emergencies generated by contagious diseases.

Introduction

Marginalization is a process by which individuals or groups are deprived of mobility, control over self-will and/or critical resources; are subjected to undignified or humiliating treatment; exposed to toxic environments; and/or physically or mentally exploited, implying greater security, health, social and political risks (Hall and Carlson, 2016). Marginalization and social exclusion can emerge when the population feels threatened by an individual or group, who is perceived as having the capacity to disunite, undermine or contaminate the community. These reactions have previously risen in the face of infectious diseases (Person, Sy, Holton, Govert, & Liang, 2004) and have now emerged with greater intensity around the world in the face of the COVID-19 pandemic. Acts of violence have been observed in virtual environments, such as aggressive posts on Facebook groups towards those with a Chinese ethnic background (Whitehead et al., 2020). This aggressive form of discrimination also incurs physical consequences, such as a denial of entry to restaurants and services to people who speak Mandarin, and even serious hate crimes like physical assaults and stabbing cases. Such acts as justified by the argument of punishing them for their alleged responsibility in causing the pandemic (Xu et al., 2021). Healthcare personnel (HP), located in the first lines of defense against the disease, were one of these marginalized sectors during the health contingency (Bhanot, Singh, Verma & Sharad, 2021). For example, in the Philippines, there were chlorine attacks on HP (Economist, 2020). In India, the mistreatment of medical personnel escalated to the point of being threatened, spat on, beaten, stoned, and thrown out of their homes (Manoj, Padubidri, Saran, Rao, Shetty, & D'Souza, 2021). In Mexico, there were reports of medical and nursing staff having eggs, hot coffee, and other verbal and physical attacks thrown at them (Semple, 2020). In April 2020, less than a month after the World Health Organization (WHO) declared COVID-19 a pandemic, at least twenty-one complaints from health workers and close to one hundred and forty calls related to acts of discrimination taken for one hour were registered with the National Council to Prevent Discrimination in Mexico. This was equivalent to what they typically received in a week (González Días, 2020). These aggressions can find their explanation in the fear of

being infected, but they require a deeper analysis since they violate human rights and obviously, harming those who care for our health is extremely detrimental to common well-being, especially when we face a health emergency such as that caused by COVID-19.

Based on these antecedents, two studies were carried out. The first study sought to quantify the disposition of the population in Mexico to marginalize HP and to identify if this disposition was associated with the perception of the HP as a possible risk of contagion. The second study extends these results, analyzing in a second sample of Mexican population other explanatory factors of marginalization towards health care personnel.

Study 1. Descriptive and sociodemographic components of marginalization

Cases of violence and marginalization towards HP have been reported in Mexico under the argument of implying a risk of contagion (Semple, 2020; González Días, 2020), but there are no studies that analyze the perception of the general population towards HP. This first study explores the perception of a sample of Mexican inhabitants towards HP, in terms of being positive, being perceived as a risk of contagion, and the disposition to marginalize them socially. Considering the isolated reports of violence, and assuming a widespread fear in the population of a disease that has cost the lives of millions, it can be proposed that HP, who are exposed daily to the virus more than others, are possibly perceived as a threat to society, due to an assumed higher capacity to spread the virus. At the same time, the important work of HP for caring community people against COVID-19 can generate a positive perception in the population, which would protect them from being marginalized. To test this hypothesis, a quantitative, cross-sectional, correlational study, with an explanatory scope, was carried out.

Materials & Methods

Participants

Participants were 193 (34.2%) men, 333 (58.9%) women, and 39 (6.9%) that no answer that question, aged between 17 and 68 years (M = 24.08, SD = 7.62), residents of northern (76%) and central-southern states (24%) from Mexico. 42.2% declared having unfinished careers, 34.2% upper secondary studies, and 19% completed undergraduate studies. 2.9% reported working in a hospital and 29.2% declared having relatives who worked in a hospital. 74.5% stated that they did not have children. No one reported having been diagnosed with COVID-19 up to the time of the survey and 92.9% confirmed that they had not had related symptoms. Only 2.8% stated that one of their family members had been diagnosed with COVID-19 and 84.4% stated that no one in their family had experienced related symptoms.

Instruments

Marginalization towards healthcare personnel. It is made up of six items: If I had a neighbor who works in a hospital, I would prefer not to find him on the street in order to not get infected; Even if I could help a doctor or a nurse, I would prefer not to do it so as not to risk getting infected; The children of nurses and doctors should not be admitted to nurseries because they can infect other children; Staff working in hospitals should be prevented from using public transport to avoid infecting others; If a person working in a hospital asked me for help I would prefer not to do so in order to avoid being infected; It would be best if the doctors and nurses moved near the hospitals in order to avoid infecting others. The exploratory factor analysis identified a single factor that groups the six items and explains 52% of the variance with a Cronbach's alpha index=.85.

Perceived contagion risk towards healthcare personnel. It is made up of three items: If I am buying something and a doctor or a nurse arrives at the same place, I would worry that they could infect me; If a doctor or a nurse are on the public transport as me, I would be afraid of being infected by them; Being close to a doctor or a nurse implies a higher risk of contagion than people who do not work in the medical industry. The exploratory factor analysis identified a

117 single factor that groups the three items, explaining 62% of the variance with Cronbach's alpha
118 =.80.
119 *Positive beliefs towards healthcare personnel*. It is made up of six items: Faced with this
120 contingency, people who work in hospitals are risking their lives for the good of everyone;
121 Nurses and doctors are the ones who most deserve our support in this contingency; Doctors
122 and nurses are acting with great courage at work since they are most at risk of infection ; If I
123 could support the doctors and nurses in this contingency, I would gladly do so; At the end of this
124 contingency, we will all be in debt to the country's doctors and nurses; While we stay at home,
125 doctors and nurses risk their lives to help others. The exploratory factor analysis identified a
126 single factor that groups the six items, explaining 39.8% of the variance with a Cronbach's alpha
127 index=.77.
128 Responses to these instruments were rated on a Likert-type scale ranging from 1 (Strongly
129 disagree) to 4 (Strongly agree). In addition, it required sociodemographic data such as age, sex,
130 educational level, whether they or a relative worked in a health care center, whether they had
131 children and whether they or their relatives had received a positive diagnosis for COVID-19, and
132 the state of residence.
133
134 **Procedure**
135 The Autonomous University of Juárez City granted full ethical approval to conduct the study
136 (Ethical Permission Reference: CEI-2020-2-43). Participants were invited to participate in the
137 study via email containing a link to the study website. Measures were administered through the
138 SurveyMonkey online tool (SurveyMonkey, San Mateo, CA, USA;
139 http://www.surveymonkey.com).
140 The survey was conducted from the second to the fourth week of April 2020, one month after
141 the WHO declared COVID-19 a pandemic on March 11, 2020 ("Coronavirus confirmed as a
142 pandemic", 2020), three weeks after essential face-to-face activities were partially or totally

143 abolished in Mexico on March 26, 2020 (Palma et al., 2020), and one week after a national
144 health emergency was declared in Mexico on March 31, 2020. 2020 (Borunda, 2020). The
145 support of students and acquaintances was requested to invite possible full-time workers as
146 participants. If they agreed to participate, the details of the informed consent and the procedures
147 for completing the measures were explained to them.
148 In order not to expose the health of the participants during the quarantine period, they were
149 reminded that these invitations should be made electronically, without leaving their homes. With
150 these characteristics, the sampling used in this study is considered non-probabilistic. Consent
151 was obtained by digital means from all participants. They were informed that their answers
152 would be confidential, their information would be protected by the research team and their
153 participation would be voluntary.
154 **Data analysis**
155 The construct validity of the instruments was verified by exploratory factor analysis with the
156 maximum likelihood extraction method, with an eigenvalue greater than 1 as an extraction
157 criterion. The internal consistency of each factor was calculated using Cronbach's alpha
158 formula. Once the structure and internal consistency were verified, new indicators were formed
159 for each instrument by averaging their items. Mean comparisons were performed using t-tests
160 and one-way analysis of variance using the software Jamovi (The jamovi project, 2021). To
161 verify the hypotheses of predictive effects on marginalization, multiple linear regressions were
162 performed using the stepwise method in the SPSS 22 program (IBM, 2013).
163
164 ## Results
165 As seen in figure 1, the averages of marginalization and perceived risk are generally low,
166 nearby to the response options “Totally disagree” and “Disagree”, while the average of positive
167 perceptions is located closer to the “Totally agree” option. These would be the general trends,
168 but it is identified that 5% report average scores of marginalization between 2.5 and 4, that 10%

report average scores between 3 and 4 of the perceived risk of contagion, and that 5% report scores of 3 and lower of positive beliefs towards HP.

INSERT FIGURE 1 HERE

Table 1 shows the comparison of marginalization averages through the different sociodemographic indicators. Statistically significant differences are observed between those who have or do not have family members who work in a health care center, with slightly higher scores on marginalization in those who do not have family members working in these centers. Those who reside in the north of the country also report slightly higher scores than the central-southern states. In both cases the scores do not reach the value 2, indicating an opinion against marginalization. Cohen's d with values close to .2 indicate a small effect size for both differences.

INSERT TABLE 1 HERE

The regression analysis showed positive effects of the perceived risk of HP (B=.44, β=.61, t=18.95, p<.001) and negative effects of positive beliefs towards HP (B=-. 15, β=-.11, t=-3.57, p<.001), which together explain 40% of the variance of marginalization towards HP (R^2=.40, $F_{2,562}$=189.03, p< .001). With a tolerance level = .99, collinearity problems between the independent variables are discarded.

Conclusions of study 1

The social perception of HP can be considered positive, with low scores of marginalization and perceived risk of contagion and high scores of positive beliefs. Slightly higher scores of

marginalization are identified in those who do not have relatives working in healthcare centers and inhabiting the northern region of the country. Although these scores are low, indicating a rejection of beliefs of marginalization towards HP. However, it should be noted that a low percentage reported high scores for disposition to marginalization and perceived risk of contagion towards HP. The regression analysis identifies that marginalization towards HP can derive mainly from the perception of risk of contagion, although the beliefs of HP as heroes who risk their lives for the good of society decreases the disposition to marginalization derived from the perceived risk of contagion.

Study 2: Psychosocial predictors of marginalization towards HP

Study 1 showed a generalized low disposition to marginalization in most of the population, although a small percentage did report this disposition in high scores. It was also identified that the perceived risk of contagion is an important predictor of marginalization, while positive beliefs towards HP help to diminish this effect. Given these results, it is necessary to identify some factors associated with a greater disposition to marginalization to understand this phenomenon. This second study identify in the previous research and propose the exploration of the following as explanatory factors of marginalization toward HP.

Cooperation

Cooperation is understood as a practice where an individual or group invests part of their resources (e.g., time, money, work) in a joint task with another individual or group to obtain a common benefit (Bowles & Gintis, 2011). This investment always involves some risk that the other investors betray our trust, for example, not contributing their resources hoping that others investment were sufficient or appropriating the obtained benefits and not sharing them.

Attacks on HP or ethnic groups under the argument that they imply a risk of contagion may be indicating a tendency to reserve cooperation only for the closest members of our group. For example, Strachman and Schimel (2006) argued that thinking about the possibility of dying motivates the need to defend a general vision of how the world works according to our own beliefs, showing evidence that generating thoughts about one's own mortality leads to a lower commitment to the romantic partner, but only when both individuals endorse very different beliefs. Using a similar methodology, Renkema et al. (2008) showed that people induced to think about their own death were more likely to change their own ideas and adhere to ideas common in their own group but rejected ideas coming from different groups. In addition, they tended to perceive people from other groups based on stereotypes, without dwelling on their differences, which can lead to a greater perception of threat from the group and its members (Haner, Sloan, Pickett, & Cullen, 2020). This behavior would be explained as a psychological strategy that would favor stronger alliances by motivating the formation of more heterogeneous groups that would allow them to confront more successfully a possible death threat. These individual cognitive processes can lead to the decomposition of the broader social fabric, affecting bonds of trust and reciprocity fundamental to the well-being of more heterogeneous communities, motivating individuals and communities to lock themselves in their closest social nuclei, deny wider cooperation, and escalate the level of hostility towards others, in this case towards health care personnel.

Uncertainty

Another factor that can exacerbate violence against others is the uncertainty generated by the pandemic. Brizi, Mannetti, and Kruglansky (2015) found that people with a dispositional need to find a quick response to situations of uncertainty, known as a need for closure, tended to discriminate more frequently against people from other groups. However, this tendency for discrimination was equally increased when uncertainty was intensified through an experimental

manipulation, even in individuals with lower levels of need for closure. That is, uncertainty, whether due to a personality disposition or generated by external conditions (e.g., a pandemic), increases the tendency to discriminate against those who are perceived as different. Cruz-Torres and Martín del Campo-Ríos (2022) identified that the uncertainty generated by the pandemic increases the disposition to selfishness (e.g., believing that during the contingency seeing for others is a mistake) and the perceived selfishness in others (e.g., considering that with contingency people try to get what they want, even going over others).

Social capital

These effects of uncertainty on cooperation may be less important in communities that have stronger bonds of reciprocity and trust. In this sense, Putnam (1994) proposes that communities vary in their levels of social capital, which is defined as the concordance between social trust, norms of reciprocity and networks of civic commitment in an association of people to coordinate collective actions. Thus, communities that maintain their networks after having successfully become organized to solve common problems, trust each other and keep their bonds active through reciprocal exchanges, are said to have high social capital.

These resources of the community have been related to a higher perception of safety, for example, in the face of criminal violence (Hansen-Nord et al., 2014; Dinesen et al., 2013). In this same sense, Cruz-Torres and Martín del Campo-Ríos (2022) identified that social capital acts as a moderator of the uncertainty derived from the pandemic, reducing the negative effects towards non-cooperation. After considering this capacity, higher levels of social capital can be expected to be associated with a lower disposition to non-cooperation and the marginalization of HP.

Perceived vulnerability to contagion

Given that the root of uncertainty, no cooperation, and margination is the fear of contagion, it is likely that people who perceive themselves to be especially susceptible to contagion tend to present greater fear and uncertainty, and with it, more intense selfishness and disposition to marginalize others. In this regard, Duncan, Schaller, and Park (2009) have shown that the perceived vulnerability to contagion can be considered an individual difference and that people have higher or lower levels that can be quantified psychometrically. Mallett, Coyle, Kuang, & Gillanders, (2021) showed that perceived vulnerability to contagion and intolerance of uncertainty are associated with greater anxiety during the pandemic. In the same sense, Padmanabhanunni, Pretorius, Stiegler, and Bouchard (2022) demonstrated that those who report high levels of perceived vulnerability to contagion have suffered more anxiety, depression, and hopelessness during the pandemic. These antecedents motivate a further exploration of the hypothesis that higher levels of perceived vulnerability to contagion are associated with a greater perception of the risk of contagion of HP and a greater willingness to marginalize them.

In summary, the study conducted by Cruz-Torres and Martín del Campo-Ríos (2022) proved that the uncertainty generated by the pandemic increased strategies of selfishness in the community, an effect that was diminished in those who perceived that their community had bonds of reciprocity, interpersonal trust, and civic engagement, which are all components of social capital. In turn, the measurement of Duncan, Schaller, and Park (2009) makes it possible to identify variations in the perceived vulnerability to contagion, a factor that could increase the effects of uncertainty and the perceived risk of contagion on marginalization towards the HP. Finally, a factor that cannot be ignored is the trust in government and health institutions, which are elements that can help prevent violence against HP.

Considering this background, this second study aims to explore the effects of the uncertainty generated by the pandemic, selfish strategies, social capital, trust in institutions, perceived risk of contagion, positive beliefs towards HP and the perceived vulnerability of contagion on the

willingness to marginalize HP in a sample of Mexican inhabitants. It is proposed as a hypothesis that the uncertainty generated by the pandemic, the perceived risk of contagion, the perceived vulnerability of contagion and selfishness will increase the willingness to marginalize HP, while positive ideas towards HP, the components of the social capital and trust in health and state authorities will help reduce this disposition.

Materials & Methods

Participants

Participants consisted of 110 men (38.5%), 176 women (61.5%), and two people that do not answer that question, aged between 18 and 63 years (M = 23.98, SD = 7.57), residents of northern (79%) and central-southern (21%) states of Mexico. Regarding the educational level, 45.8% had unfinished undergraduate studies, 17.9% had intermediate level studies and 26.9% had completed undergraduate studies. 1.8% reported working in a hospital and 25.7% declared having relatives who worked in a hospital; 82.6% stated that they did not have children. No one reported having been diagnosed with COVID-19 and 95.1% stated that they had not had related symptoms. 7.7% stated that one of their relatives had been diagnosed with COVID-19 and 78.2% stated that no one in their family had experienced symptoms.

Instruments

In this study the same instruments of the study 1 were used besides the following measurements.

Community Assessment of Social Capital (Cruz & Contreras, 2015). Responses are rated in 10 items on a 4-point Likert-type scale (1 = Strongly disagree to 4 = Strongly agree). Internal reliability estimates for this scale are $\alpha > .80$ for three factors (Cruz & Contreras, 2015). The first factor is called reciprocity and refers to the willingness to support and the expectation of receiving support in response (e.g., If a neighbor asks me for a favor, I know that I will have their

support when I need it). The second factor refers to the ability and willingness of neighbors to organize and solve community problems (e.g., if a problem arose on our streets, the neighbors would organize quickly) and is called civic engagement networks. The third factor refers to negative beliefs that denote distrust towards neighbors (e.g., If I am careless, my neighbors would take the opportunity to do something bad to me). To facilitate their interpretation, the estimates of these elements were recorded inversely, so the factor was named confidence. Confirmatory factor analysis showed adequate goodness-of-fit indices (RMR = .03; GFI = .95; AGFI = .91; CFI = .96; RMSEA = .07, CI 90% [.04, .09], PCLOSE= .08), except for the Chi^2 indicator (Chi^2 = 55.24, df = 24, p <.001) (Cruz-Torres & Martín del Campo-Ríos, 2022).

Strategies of selfishness during the pandemic. Instrument that measures in its first factor named selfishness (three items) the concentration of cooperation during the pandemic in the closest social circles, (e.g., In these moments of contingency it is best to see for your family, not for others); and in the second factor named perceived selfishness (three items) the perception that others are not willing to cooperate either (e.g., During a health contingency people try to see only for their own benefit). Responses are rated on a 4-point Likert-type scale (1 = Strongly disagree to 4 = Strongly agree). Confirmatory factor analysis showed adequate goodness-of-fit indices (RMR = .03; GFI = .97; AGFI = .93; CFI = .95; RMSEA = .07, CI 90% [.03, .11], PCLOSE= .13), except for the Chi^2 indicator (Chi^2 = 19.98, df = 8, p = .01) (Cruz-Torres & Martín del Campo-Ríos, 2022).

Measurement of the uncertainty resulting from the coronavirus contingency. Instrument adapted from Lambert, et al. (2014) that evaluates through 5 items in a single factor the perception of uncertainty in the face of changes derived from the health contingency (e.g., At this time I am not sure of my ability to successfully face this contingency). Responses are rated on a 4-point Likert scale (1 = Strongly Disagree to 4 = Strongly Agree).

Confirmatory factor analysis showed adequate goodness-of-fit indices (Chi^2 = 4.18, df = 4, p = .38; RMR = .01; GFI = .99; AGFI = .97; CFI = .99; RMSEA = .01, 90% CI [<.001, .09], PCLOSE=.66) (Cruz-Torres & Martín del Campo-Ríos, 2022).

Perceived vulnerability to disease (Schaler, 2009). It measures individual differences in perceived vulnerability to infectious diseases across two factors. The Perceived Infectivity subscale (seven items) examines individuals' beliefs about their susceptibility to infectious diseases (e.g., In general, I am very susceptible to colds, the flu, and other infectious diseases). The germ aversion subscale (eight items) measures people's discomfort in situations that connote a higher probability of transmission of pathogens (e.g., I prefer to wash my hands soon after shaking someone's hand). Confirmatory factor analysis showed adequate goodness-of-fit indices (RMR = .06; GFI = .96; AGFI = .94; CFI = .96; RMSEA = .05, CI 90% [.02, .08], PCLOSE= .31), except for the Chi^2 indicator (Chi^2 = 36.19, df = 19, p = .01) (Cruz-Torres & Martín del Campo-Ríos, 2022).

Trust in institutions. Trust towards two institutions was evaluated through two independent items: 1) "How much do you trust the health authorities of your state?" and 2) “How much do you trust the governor of your state?”, both presented in a Likert-type format with response options ranging from 1 (not at all) to 5 (a lot).

Procedure

Were followed the same procedure and ethical care described in study one. The survey was carried out from the last week of May and the first week of June 2020.

Data Analysis

To verify the hypotheses of predictive effects on marginalization, multiple linear regressions were used using the stepwise method in the SPSS 23 program. To integrate the effects of the independent on the dependent variables in a single model, a trajectory analysis was carried out with the AMOS 22 program (Arbuckle, 2013).

Results

As in study 1, the averages of marginalization (1.4) and perceived risk of contagion (1.69) were low and positive beliefs towards HP were high (3.17).

The hypotheses of effects of the independent on the dependent variables were verified by means of linear regressions before proceeding to the trajectory analysis. The regression on marginalization towards HP confirms the effects found in study 1 of the risk of contagion and positive ideas towards HP, adding the effects of selfishness. The model explains 52% of the variance of marginalization (R^2=.52, $F_{3,284}$=106.18, p<.001) derived from positive effects of the risk of infection of HP (B=.39, β=. 58, t=13.98, p<.001), selfishness (B=.18, β=.27, t=6.52, p<.001) and negative effects of positive ideas towards HP (B= -.16, β=-.10, t=-2.57, p=.01). The tolerance levels obtained higher than .93 rule out problems of collinearity between the independent variables.

Subsequently, the effects of regression towards the risk of contagion perceived by HP were explored, having as independent variables the factors of social capital (reciprocity, civic engagement networks, and trust), trust towards state health authorities, trust towards the governor of the state, the uncertainty in the face of COVID-19, their selfishness and the selfishness perceived in others. The model explains 9% of the variance of the risk of contagion perceived by HP (R^2=.09, $F_{3,281}$=9.25, p<.001) derived from the positive effects of selfishness (B=.21, β= .21, t=3.63, p=.01), the uncertainty generated by the COVID-19 pandemic (B=.13, β=.13, t=2.39, p=.01) and negative effects of confidence in the state health authorities (B=-.12, β=-.13, t=-2.39, p=.01). Tolerance showed scores higher than .96, discarding collinearity problems. The factors of social capital, trust in the governor, perceived selfishness in others, aversion to germs, and contagion vulnerability did not show statistically significant regression coefficients and were excluded from the model.

The same variables, plus the perceived risk of contagion from HP, were used as independent variables to predict the positive beliefs of HP. The resulting model explains 7% of the variance (R^2=.078, $F_{3,280}$=7.73, p<.001) derived from the positive effects of trust in health authorities (B=.10, β=.21, t=3.63, p<.001) and selfishness perceived in others (B=.10, β=.16, t=2.78, p=.006) and negative effects of the selfishness factor (B=-.10, β=-.16, t=-.28, p=.005). The tolerance was greater than .90, discarding collinearity problems in the model. The factors of social capital, trust in the governor, germ aversion, contagion vulnerability, and uncertainty did not show statistically significant regression coefficients and were excluded from the model.

The analysis was also replicated to predict selfishness, finding positive effects of repeated perceived selfishness in others (B=.28, β=.29, t=5.32, p<.001), the perceived risk of HP (B =.18, β=.19, t=3.45, p=.001), trust in state authorities (B=.10, β=.14, t=2.50, p=.01), and negative effects of positive beliefs towards HP (B=-.21, β=-.13, t=-2.38, p=.01). Together, these variables explain 15% of the variance of selfishness (R^2=.15, $F_{4,279}$=12.86, p<.001), discarding collinearity problems with tolerance values greater than .93. The factors of social capital, trust in the governor, germ aversion, contagion vulnerability, and uncertainty did not show statistically significant regression coefficients and were excluded from the model.

Once the relevant variables to predict the marginalization of HP and their relationships were identified, these were integrated into a single model through path analysis. All trajectories show statistically crucial Critical Ratio (CR) values. As shown in figure 2, the model explains 53% of the variance of marginalization towards HP, where the risk of infection of HP (CR=14.02, p<.001) and selfishness (CR=6.56, p<.001) increase the odds of marginalization, while positive beliefs towards HP decrease them (CR=-2.59, p=.009). In turn, 9% of the variance in the risk of contagion of HP is explained, derived from positive effects of selfishness (CR=3.79, p<.001), from the uncertainty due to the COVID-19 pandemic (CR= 2.49, p=.01) and negative trust in health institutions (CR=-2.72, p=.007). The variance of positive beliefs towards HP is explained by 7%, derived from the positive effects of trust in institutions (CR=2.95, p=.003) and perceived

selfishness (CR=2.26, p=. 02), and negative effects of the perceived risk of contagion of HP (CR=-2.24, p=.02). Finally, the variance of selfishness is explained by 8%, originating solely from selfishness perceived in others during the pandemic (CR=5.10, p<.001).

The indicator Chi^2=15.67, df=10, p=.10 shows that the discrepancies between the relationships established in the model and those observed in the data matrix are not statistically significant. With a value of SRMR=.04, it can be assumed that the model has a tolerable level of residual variance once the trajectories have explained the variance of the dependent variables. Being above .95 and .90, respectively, the GFI=.98 and AGFI=.95 values indicate that the variance explained by the model is generally adequate. The CFI=.98 indicator tells us that the fit of the model is significantly better than the fit of a null relationship model. The indicator RMSEA=.04, CI 90% [<.001, .08], PCLOSE=.53 indicates that we could expect an equally good fit for this model when replicated in other samples from the same population. Overall, these indicators indicate adequate competency in fit.

INSERT FIGURE 2 HERE

Discussion

No case of violence is acceptable, but fortunately so far only isolated cases of violence have been observed in Mexico and no case, at least known, of lynching or more extreme forms of violence that cost the lives of HP have been identified during the pandemic. This coincides with the results presented here of low disposition to marginalization in the measurements of both studies. However, the fact that there are minorities that report high scores in this measurement should not be neglected. Although they are few, it must be considered that acts of extreme social violence require only some committed inciters to ignite an entire community fearful for its

safety and lead it to commit inhumane acts of violence through processes of social contagion (Bonnasse-Gahot, Berestycki, Depuiset, Gordon, Roche, Rodriguez, & Nadal, 2018).

In the model, the effects of uncertainty and selfish strategies generated by the pandemic that increase the marginalization of HP should be highlighted. This reaction can be explained because of the in-group bias (Hewstone, Rubin, & Willis, 2002), which is a strategy aimed at seeking stable reciprocal links that encourage trust towards and cooperation with those who are perceived as members of the group itself, seeking to reduce the risk of being betrayed by members of other groups who do not share the same interests (Yamagishi & Kiyonari, 2000). This bias does not necessarily imply hostility towards members of other groups (Brewer, 1999), but Choi & Bowles (2007) have proposed that this hostility (known as parochialism) and ingroup bias have evolved together in our species as strategies to appropriate scarce resources essential for survival (Grossman & Mendoza, 2003).

This perception of HP as *others*, outside of the community, could also be explaining the inability of social capital to reduce marginalization. Social capital could reduce the marginalization of members of my community for instance (Cruz-Torres & Martín del Campo, 2022), but not necessarily of people outside of it. In fact, the results of Alcorta, Smits, Swedlund, and de Jong (2020) shows that social capital is a facilitator for achieving community goals, which are not always peace-oriented. In reference to their study conducted in Africa, they note that a strong identity with the community is associated with a greater disposition to political violence, where social capital would serve as a catalyst for actions against other groups perceived as different.

This pandemic has exposed a risk of marginalization that seems new to most HP, although it has been a constant experience for those fighting ancient endemic contagious diseases such as malaria, Ebola, or leprosy. These experiences make it necessary to reflect on the integration of healthcare centers and their staff in the communities they serve, as part of that same social fabric, for which community interventions and the collaboration of health units with other local authorities would be necessary. This integration would favor a common identity for the

inhabitants and HP, which would reduce the risk of marginalization, but would also facilitate other prevention processes if they would be perceived as people interested in achieving good for the community, namely, *their* community. If achieved, this integration would also favor trust in health authorities, an element that is identified here as relevant for improving the perception of HP.

Conclusions

The scores of marginalization and perceived risk of contagion are low, while the scores of positive beliefs are high, indicating a general positive perception of HP.The main predictor of marginalization is the perceived risk of contagion, which is increased by the strategy of selfishness and the uncertainty generated by the COVID-19 pandemic. Social capital does not contribute to preventing the marginalization of HP. Strategies of selfishness, contrary to cooperation, motivate the marginalization of HP and increase the risk of contagion perceived in HP. Confidence in the state health authorities reduces the perceived risk of contagion and promotes positive beliefs towards HP, making clear the importance of the authorities to prevent marginalization and their ability to support their personnel from the confidence that their work generates in communities. The perceived susceptibility of contagion was not relevant to predicting marginalization or antecedent factors such as personal selfishness or the risk of contagion of HP, indicating that these factors can be explained by the high risk perceived in others, and not in one's own vulnerability.

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References

494 Alcorta, L., Smits, J., Swedlund, H. J., & de Jong, E. (2020). The 'Dark Side' of social capital: A
495 cross-national examination of the relationship between social capital and violence in
496 Africa. *Social Indicators Research*, *149*(2), 445-465.
497 Arbuckle, J. L. (2013). Amos (Version 22.0) [Software]. Chicago: SPSS.
498 Baumeister, R. F., Twenge, J. M., & Nuss, C. K. (2002). Effects of social exclusion on cognitive
499 processes: anticipated aloneness reduces intelligent thought. *Journal of personality and*
500 *social psychology*, *83*(4), 817.
501 Bhanot, D., Singh, T., Verma, S. K., & Sharad, S. (2021). Stigma and discrimination during
502 COVID-19 pandemic. *Frontiers in public health*, 829.
503 Bonnasse-Gahot, L., Berestycki, H., Depuiset, M. A., Gordon, M. B., Roché, S., Rodriguez, N.,
504 & Nadal, J. P. (2018). Epidemiological modelling of the 2005 French riots: a spreading
505 wave and the role of contagion. *Scientific reports*, *8*(1), 1-20.
506 Borunda, D. (2020, March 21). *Coronavirus: Mexico declares national health emergency, bans*
507 *nonessential activity.* El Paso Times.
508 https://www.elpasotimes.com/story/news/health/2020/03/31/coronavirus-pandemic-
509 mexico-declares-national-public-health-emergency/5093905002/
510 Brewer, M. B. (1999). The psychology of prejudice: Ingroup love and outgroup hate? *Journal of*
511 *social issues*, *55*(3), 429-444.
512 Brizi, A., Mannetti, L., & Kruglanski, A. W. (2016). The closing of open minds: Need for closure
513 moderates the impact of uncertainty salience on outgroup discrimination. *British Journal of*
514 *Social Psychology*, *55*(2), 244-262.
515 Choi, J. K., & Bowles, S. (2007). The coevolution of parochial altruism and war. *Science*,
516 *318*(5850), 636-640.
517 Cruz-Torres, C. E., & Martín del Campo-Ríos, J. (2022). Social capital in Mexico moderates the
518 relationship of uncertainty and cooperation during the SARS-COV-2 pandemic. *Journal of*
519 *Community Psychology*, 50:1048–1059.

520 Dinesen, C., Ronsbo, H., Juárez, C., González, M., Estrada Méndez, M. Á., & Modvig, J.
521 (2013). Violence and social capital in post-conflict Guatemala. *Revista panamericana de*
522 *salud pública*, *34*, 162-168.
523 Duncan, L. A., Schaller, M., & Park, J. H. (2009). Perceived vulnerability to disease:
524 Development and validation of a 15-item self-report instrument. *Personality and Individual*
525 *differences*, *47*(6), 541-546.
526 Economist. (2020). Health workers become unexpected targets during COVID-19.
527 González Díaz, M. Coronavirus: el preocupante aumento de agresiones en México contra
528 personal médico que combate el COVID-19. BBC News Mundo en México. 17 abril 2020.
529 Grossman, H. I., & Mendoza, J. (2003). Scarcity and appropriative competition. *European*
530 *Journal of Political Economy*, *19*(4), 747-758.
531 Hall, J. M., & Carlson, K. (2016). Marginalization. *Advances in Nursing Science*, *39*(3), 200-215.
532 Haner, M., Sloan, M. M., Pickett, J. T., & Cullen, F. T. (2020). Safe haven or dangerous place?
533 Stereotype amplification and Americans' perceived risk of terrorism, violent street crime,
534 and mass shootings. *The British Journal of Criminology*, *60*(6), 1606-1626.
535 Hansen-Nord, N. S., Skar, M., Kjaerulf, F., Almendarez, J., Bähr, S., Sosa, Ó., Castro, J.,
536 Andersen, A. & Modvig, J. (2014). Social capital and violence in poor urban areas of
537 Honduras. *Aggression and Violent Behavior*, *19*(6), 643-648.
538 Hewstone, M., Rubin, M., & Willis, H. (2002). Intergroup bias. *Annual review of psychology*,
539 *53*(1), 575-604.
540 IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM
541 Corp.
542 Kline, R. B. (2016). *Principles and practice of structural equation modeling*. Guilford
543 publications.
544 Lambert, A. J., Eadeh, F. R., Peak, S. A., Scherer, L. D., Schott, J. P., & Slochower, J. M.
545 (2014). Toward a greater understanding of the emotional dynamics of the mortality

546 salience manipulation: Revisiting the “affect-free” claim of terror management
547 research. *Journal of personality and social psychology*, *106*(5), 655.
548 Mallett, R., Coyle, C., Kuang, Y., & Gillanders, D. T. (2021). Behind the masks: A cross-
549 sectional study on intolerance of uncertainty, perceived vulnerability to disease and
550 psychological flexibility in relation to state anxiety and wellbeing during the COVID-19
551 pandemic. *Journal of Contextual Behavioral Science*, *22*, 52-62.
552 Manoj, M. A., Padubidri, J. R., Saran, J., Rao, S. J., Shetty, B. S. K., & D’Souza, H. (2021).
553 Violence against HP in India: Covid-19 prompts stricter laws. *Medico-Legal Journal*, *89*(4),
554 260-263.
555 Palma, L., Rubio Barnetche, L., & Lecona, O. (2020, March 26). *COVID-19 en México: diversas*
556 *instituciones y autoridades suspenden sus actividades.* Holland & Knight.
557 https://www.hklaw.com/en/insights/publications/2020/03/covid19-en-mexico-diversas-
558 instituciones-y-autoridades-suspenden.
559 Padmanabhanunni, A., Pretorius, T. B., Stiegler, N., & Bouchard, J. P. (2022). A serial model of
560 the interrelationship between perceived vulnerability to disease, fear of COVID-19, and
561 psychological distress among teachers in South Africa. *Annales Médico-psychologiques,*
562 *revue psychiatrique*, 180(1), 23-28.
563 Person, B., Sy, F., Holton, K., Govert, B., & Liang, A. (2004). Fear and stigma: the epidemic
564 within the SARS outbreak. *Emerging infectious diseases*, *10*(2), 358.
565 Semple, K. (2020). Afraid to be a nurse”: health workers under attack. *The New York Times*, 11-
566 12.
567 The jamovi project (2021). *jamovi* (Version 1.6) [Computer Software]. Retrieved from
568 https://www.jamovi.org
569 Whitehead, D. (2020). You deserve the coronavirus’: Chinese people in UK abused over
570 outbreak. *Sky News.*

571 Xu, J., Sun, G., Cao, W., Fan, W., Pan, Z., Yao, Z., & Li, H. (2021). Stigma, discrimination, and
572 hate crimes in Chinese-speaking world amid Covid-19 pandemic. *Asian journal of*
573 *criminology*, *16*(1), 51-74.
574 Yamagishi, T., & Kiyonari, T. (2000). The group as the container of generalized reciprocity.
575 *Social Psychology Quarterly*, 116-132.

Table 1(on next page)

Comparison of the averages of marginalization towards HP by different sociodemographic indicators

Source: Own elaboration.

Table 1

Comparison of the averages of marginalization towards HP by different sociodemographic indicators

Variable	Statistical result	Group	Mean
Some relative Works at a clinical or hospital	$t_{332.69}$=-2.12, p=.03, d=-.19	Yes	1.35
		No	1.45
Country zone	$t_{224.90}$=2.23, p=.02, d=.25	North	1.43
		Center-South	1.32
Works at a clinical or hospital	t_{522}=-1.71, p=.08, d=-.48	Yes	1.20
		No	1.43
Sex	t_{524}=.56, p=.57, d=.05	Men	1.44
		Women	1.41
Having children	t_{593}=-.197, p=.84, d=-.02	Yes	1.41
		No	1.43
Level of schooling	$F_{4,521}$=2.30, p=.05	Primary	1.46
		High school	1.42
		Bachelor uncomplete	1.48
		Bachelor degree	1.32
		Postgraduate	1.27

Source: Own elaboration.

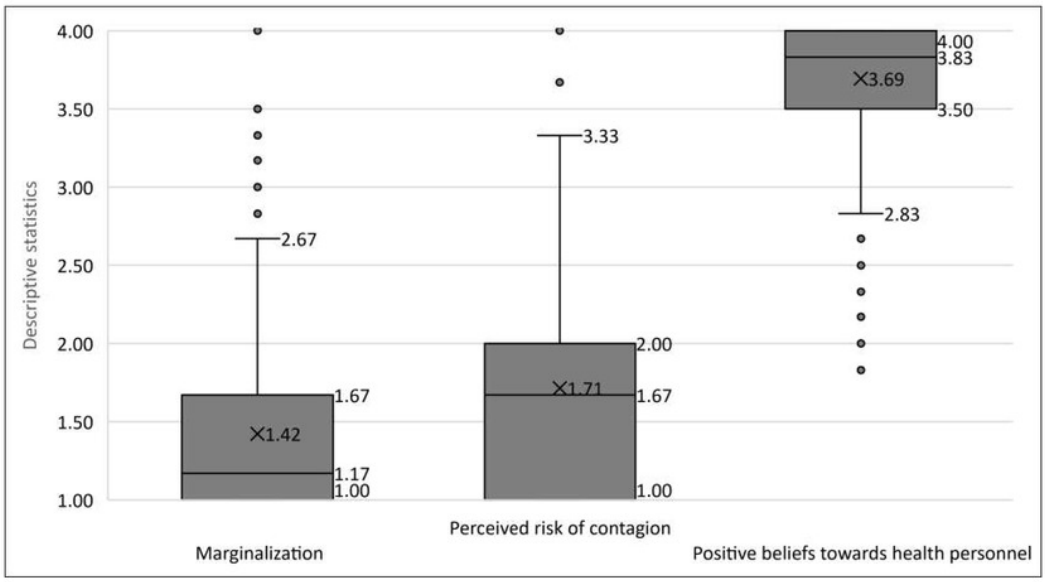
Figure 1

Descriptive statistics of marginalization factors, perceived risk of contagion and positive perceptions towards HP.

Low scores are observed for marginalization and perceived risk of contagion, and high scores for positive perceptions towards HP. Source: Own elaboration.

Figure 1.

Descriptive statistics of marginalization factors, perceived risk of contagion and positive perceptions towards HP.



Note: Low scores are observed for marginalization and perceived risk of contagion, and high scores for positive perceptions towards HP.

Source: Own elaboration.

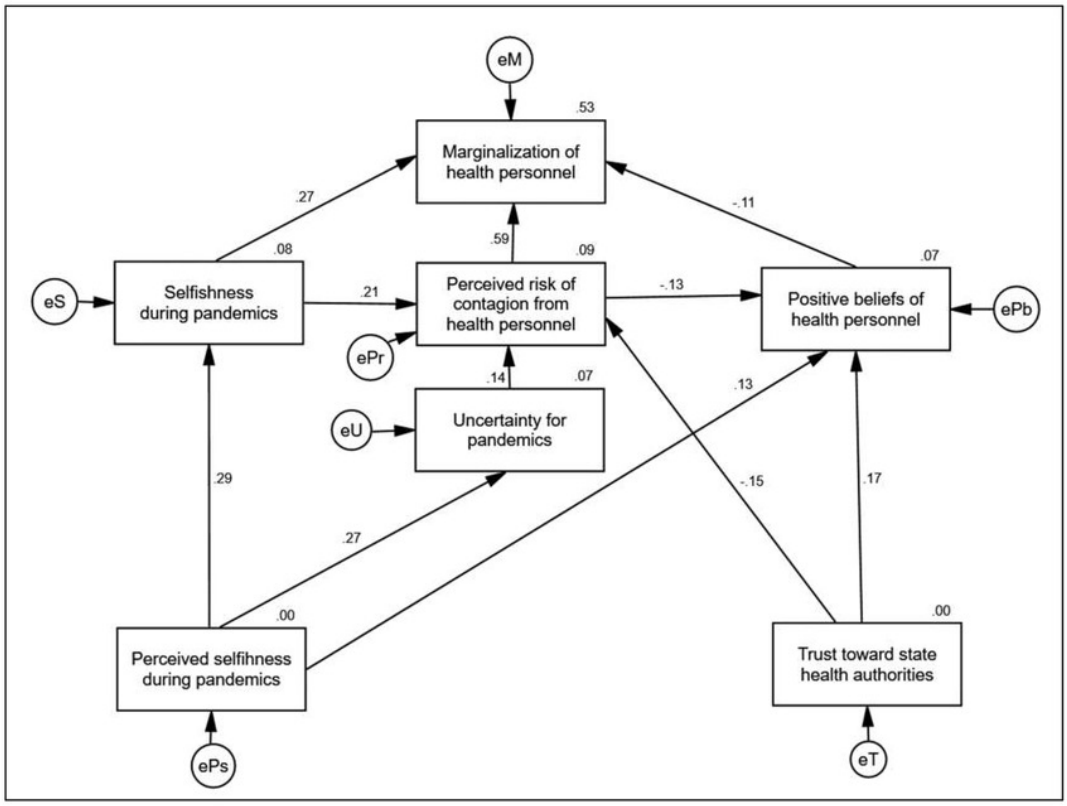
Figure 2

Path analysis to explain the disposition to marginalize HP

The path analysis explains 53% of the variance of marginalization towards healthcare personnel, showing indicators of an adequate goodness of fit. Standardized values are shown. Source: Own elaboration

Figure 2.

Path analysis to explain the disposition to marginalize HP



Note: The path analysis explains 53% of the variance of marginalization towards healthcare personnel, showing indicators of an adequate goodness of fit.

Standardized values are shown.

Source: Own elaboration