

Meta-analysis of Perceptions of Occupational Risks in the COVID-19 Era

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Abstract

The objective of the work was to review the literature on the perception of occupational risks during the pandemic. A documentary, cross-sectional and systematic research was carried out with a selection of journals indexed to international repositories, considering the period that the pandemic takes from 2019 to 2022. A network of profusion and connectivity was found that explains the differences and perceptive similarities around risks labor. In relation to biosafety policies, it is recommended to adjust the model in order to anticipate decisions and Behaviors determined by expectations against or in favor of work accidents and professional illnesses.

Keywords: COVID-19; Risk perception; Meta-Analysis; Homogeneous random effects

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Introduction

Until November 2022, the pandemic has claimed the lives of five million, although international health systems such as the World Health Organization and the Pan American Health Organization recognize the underreporting of community transmission. Therefore, the death toll could rise to 20 million. In this scenario of risks of contagion, disease and death, the mitigation and containment policies for the pandemic consist of strategies of distancing, confinement and social immunization [1, 2]. In the case of organizations and institutions, biosecurity policies translate into the prevention of risks such as the use of masks, ventilation, ozone measurement or the frequent use of alcohol gel.

However, risk prevention policies, strategies and programs are built from the recommendations for the ventilation of closed spaces and the immunization of people, discarding the expectations of workers [2]. In this sense, a review of the state of the art suggests that the type of employment corresponds to occupational health [3].


It is assumed that jobs with higher risk are prone to uncertain scenarios with medium or high benefits [4]. If risk aversion is the avoidance of exposure to accidents and illnesses, then risk propensity is identification with jobs and salaries above the average, but with exposure to health effects such as the pandemic [5].

The theoretical and conceptual approaches that explain occupational risks are: 1) the theory of risk perception, 2) the prospective decision theory and 3) the theory of job expectations. These are theoretical perspectives that explain the impact of anti-COVID-19 policies, biosafety programs, and prevention strategies at work.

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Risk perceptions, understood as the expectation of costs and benefits around external demands and internal resources for organizations; suggest that accidents and illnesses can be anticipated [6]. In a risk scenario such as that of the pandemic, the perception of risk is triggered by the expected gains and losses in the face of a decision or labor action. An increase in accidents and illnesses reflects an increase in risk propensity [7]. A reduction of costs and benefits implies an aversion to risks [7]. That is, the perception of risks indicates the degree of opportunities and profits, considering the trend of infections, illnesses or deaths related to a work activity [8] the contribution of the perceptive approach to risks consists of an approach to the confidence of the workers regarding their leaders.

However, the mitigation and containment policies of the pandemic through the implementation of distancing, confinement and immunization strategies limit the workplace and reorient it towards biosafety guidelines [9] In this situation, the theory of prospective decisions explains the relationships between leaders and talents in the face of contingent events [10] The theoretical approach raises differences between those who make decisions and those who abide by them [11]. In this hierarchy, leaders make decisions minimizing the expectations of their workers [12] this is the case of prospective decisions that consist of accepting high costs to obtain greater benefits (García et al., 2016b: p. 270). Such

managerial decisions can be supported by workers as long as they receive a distribution of profits.

However, if employees notice higher costs than benefits, they will develop distrust towards their leader (García, 2012: p. 37). In this situation, risk perceptions may be minimal and prospective management decisions supported, but with levels of mistrust among employees [13]. The job expectations approach suggests that this distrust can be generated by the absence of objectives and goals [14] Or, mistrust can stem from technology investment associated with layoffs or job rotations.

Risk perceptions explain that accidents and illnesses can be prevented if they are considered close to the workers. In another sense, prospective decisions choose processes with high costs expecting greater benefits In the midst of both proposals; job expectations are translated into confidence when workers notice preventive risk management based on the dissemination of benefits versus prospective decisions.

Theories of risk perception suggest that occupational risks arise from uncertain scenarios such as the processes of contagion, illness and death from COVID-19 at the beginning of the pandemic in developed countries and during the pandemic so far in developed countries. about the development process. The differences between the countries suggest that the degree of uncertainty regarding the SARS CoV-2 coronavirus warns of asymmetries in the perceptions of the effects of the pandemic in the workplace. In this way, occupational risks and accidents become even more relevant if they are viewed in a context of imminent risk in the face of the pandemic.

Theoretical and conceptual frameworks of risk perception assume that events are unpredictable, immeasurable, and uncontrollable [15]. Based on these criteria, risk events are approached from the bias of perception or expectation of those who are exposed and vulnerable.

In this way, risk expectations are divided into risk aversion and propensity In the workplace, aversion is manifested in increased self-care. If COVI-19 is considered a pandemic, it generates biases in life expectancy and increases prevention through the use of gloves, masks, and face shields. If it is assumed as a, then the evaluations are oriented in the opposite pole and adherence to treatment is generated as long as it is associated with social support. In this way, high-risk jobs will match their levels of adherence to treatment with native professionals who do not have social or family support.

Risk perception indicators are a reflection of the degree of biased expectations towards an event such as the SARS CoV-2 pandemic [16] an increase in the use of contagion prevention devices correlates with an increase in the immeasurability of risks, although hopelessness also emerges as a provisional response. Impotence is the result of repetitive risk events that override the self-care response. Consequently, the intensified and prolonged pandemic breeds hopelessness. On the contrary, if the event is attended, the helplessness is reduced.

Risks are also the result of their determinants, as is the case with the perception of control The emergence of self-control is the product of a high expectation of risk, but also of experiences of

control that guide the individual to assume self-efficacy in health care. Self-efficacy is determined by the expectation of control and the belief that the event will be reversed by some vaccine. Technology is a determining factor in risk perception and event control. The pandemic is a risk event that can be reduced to its minimum expression as long as the individual assumes that their self-care will be complemented by a vaccine.

However, the perception of control is mediated by risk attribution biases, such as stigma If the pandemic is assumed to be uncertain, then it affects the perception of control and risks. On the contrary, if the health personnel is seen as a lifesaver, then self-care is reoriented towards trust in health professionals and rehabilitation or adherence to treatment.

The theoretical, conceptual and empirical frameworks agree in assuming that the pandemic is a risk event that can reduce its effects if the media and communication networks spread a vaccine. Immunization complements self-care and promotes adherence to treatment or rehabilitation. To date, the consistency of this formulation has not been reviewed.

Consequently, the modeling of perception or expectation biases in the face of a risk such as infection, disease or death from COVID-19 has not been clarified. A model can be reflexive if the goal is to understand the symptoms of responses to the pandemic. A model can be educational if information is available on the effect of immunization on self-care and adherence to treatment or rehabilitation.

In this way, a hybrid model can combine the symptoms of a risk perception consistent with the pandemic (Mendez et al., 2015). In a reflexive sense, the perception of risks can be appreciated from the biases of expectations or despair. In the case of the literature consulted, expectations can be seen in the questioning of anti-COVID-19 policies. A considerable increase in criticism reflects a significant perception of risk. A decrease in the use of devices such as masks, shields or gloves implies a lack of political trust that translates into a propensity for risk.

In this way, the objective of the present work was to specify a model for the study of risk perception, considering a review of the literature from 2019 to 2021, as well as the contrast of the null hypothesis regarding the significant differences between the structure of the perception of occupational risks with respect to the observations of the present work.

What are the homogeneous random effects of the findings related to the perception of occupational risks during the pandemic?

The premises that guide this work suggest: 1) the pandemic is a global phenomenon that has impacted occupational health through exposure to risks of contagion, illness or death, as well as through the media and electronic networks through of the information disseminated on anti-COVID-19. Policies The anti-COVID-19 policies focused their strategy on the distancing and confinement of people, transforming work activity into a work environment 3) Risk communication as part of anti-COVID-19 policies determined personal strategies for the use of devices such as masks, alcohol gel or facial protectors). 4) Anti-Covid-19 policies were disseminated through risk communication The increase in infections, illnesses and deaths from COVID-19

spread in the media and electronic networks contravened the risk communication that consisted of mitigating and containing the pandemic 6) The differences between the news and the official version affected the perception of risks 7) An important contradiction between the media version and the official version affected the increase in the perception of risk and the intensive use of masks and face shields. 8) A concatenation between officialism and mediatisation generated flexibility in the use of masks and shields (Camacho and Mayorga, 2017). 9) The literature that observed both processes established significant differences and anticipated high-risk scenarios in cases where officialise and media coverage converged.

Method

Given that the literature on occupational risks and risk perception coincides in assuming that the impact of the pandemic in the workplace is uncertain, unpredictable, immeasurable and uncontrollable, a documentary review study was carried out in order to be able to warn of the prevalence of homogeneity, random effects in the specialized literature on occupational risks and perception of risks derived from the pandemic. A documentary study was carried out with a selection of sources indexed to international repositories, considering the edition period from 2019 to 2022 (Table 1).

In order to evaluate the relationship between the theories that explain occupational risks with respect to the findings reported in the literature, the Delphi Inventory was used (García et al., 2014b: p. 73). In three phases, expert judges in the field evaluated the results consulted in the public literature from 2019 to 2021 on occupational risks. The selection criteria of the expert judges were the h index of production in Google Scholar and the area of knowledge in work sciences. Table 2 shows the characteristics of the judges who rated the relevance of the findings in the selected literature during the pandemic. It is possible to appreciate that these are experts in labor studies with an impact factor index below the 44 points required to be considered an influential author, but their scores place them as authors in consolidation. In other words, based on the criteria of the judges, an explanatory

Table 1. Descriptive of the sample.

Repository	Accidents				Diseases			
	2019	2020	2021	2022	2019	2020	2021	2022
Academy	1	3	2	3	2	4	2	2
Copernicus	2	2	1	2	1	3	1	1
Dialnet	3	1	3	4	1	2	3	3
Dimensions	4	3	2	1	1	1	4	2
Ebsco	2	2	1	2	3	2	3	4
Borders	3	3	1	3	4	1	5	3
Google	4	2	1	2	2	2	4	2
Latindex	1	1	2	2	2	1	3	3
Mendeley	2	3	1	1	4	3	1	3
Microsoft	5	2	3	1	1	1	2	3
Redalyc	1	2	3	1	1	1	1	4
Scielo	4	4	2	1	1	3	1	2
Scopus	3	2	4	1	3	2	1	3
Zenodo	2	1	3	2	2	1	1	1
Zotero	1	3	1	3	1	1	1	1

model can be built on the impact of the pandemic on occupational risks, mainly on illnesses and accidents directly and indirectly related to COVID-19 (Table 2).

In the first phase, the expert judges rated the relationship established in the consulted literature, considering: 0 = "not at all in agreement" to 5 = "quite in agreement". In the second phase, the averages of the first round were compared with the individual ratings of the judges in that first phase. In the third phase, the ratings based on the second round were reconsidered. Or, the expert judges reiterated their initial ratings, even when confronted with the average. Table 3 shows the averages and standard deviations of the judges' scores from which the differences with non-parametric statistics were established. The chi square shows that there are differences in the criteria of the judges regarding the impact of the pandemic on occupational risks, mainly accidents and diseases in the literature consulted. Such findings are evident from one round to the next. That is, the criteria of the judges reveal a dissent in the second phase and a consensus in the third phase (Table 3).

Table 2. Descriptions of the expert judges.

Sex	Years	Entry	Area	h-index
Male	56	18'954.00	Occupational health	32
Feminine	61	16'964.00	Entrepreneurship	21
Feminine	77	15'843.00	Human Resources	17
Male	83	16'905.00	Human capital	26
Feminine	42	16'534.00	Intellectual capital	19
Male	53	19'674.00	Talent management	20
Feminine	62	17'534.00	process quality	60

Table 3. Descriptive of the evaluated findings.

R1	M	SD	2		
			df	p	
judge 1	4.32	1.34	14.21	13	.05
Judge 2	4.56	1.54	13.25	14	.07
Judge 3	4.32	1.21	12.13	12	.03
Judge 4	4.36	1.43	10.45	fifteen	.08
Judge 5	4.12	1.09	15.46	14	.06
Judge 6	4.32	1.46	14.32	14	.07
Judge 7	4.30	1.07	15.71	10	.08
R2					
judge 1	4.36	1.21	13.26	12	.04
Judge 2	4.89	1.34	14.36	eleven	.03
Judge 3	4.35	1.21	16.57	14	.02
Judge 4	4.32	1.45	13.21	fifteen	.06
Judge 5	4.12	1.32	19.67	13	.05
Judge 6	4.34	1.32	19.21	13	.08
Judge 7	4.36	1.56	14.35	12	.06
R3					
judge 1	4.36	1.08	13.21	14	.07
Judge 2	4.45	1.31	14.35	12	.09
Judge 3	4.03	1.24	10.45	13	.06
Judge 4	4.41	1.12	13.24	12	.04
Judge 5	4.37	1.35	14.89	eleven	.03
Judge 6	4.35	1.54	18.21	13	.06
Judge 7	4.67	1.36	14.35	14	.09

Source: Prepared with data from the study, R = Evaluation round of the expert judges, R1 = Qualification phase, R2 = Comparative phase, R3 = Reconsideration phase, M = Mean or average of the judges' qualifications, SD = Standard deviation of the evaluations of expert judges.

The data was captured in Excel and processed in JASP version 15.0 considering the normal distribution, contingency, correlation, adjustment and residual analyses in order to test the null hypothesis about the differences between the reported findings and the ratings of the expert judges (García , 2013: page 363). The values were interpreted considering their proximity to the unit with the exception of the residual coefficients.

Results

Figure 1 shows the networks of profusion and connectivity among the expert judges with respect to the findings evaluated in three rounds. The relationship structure suggests that the summaries evaluated are circumscribed to evaluative neutrality on the part of the expert judges. In other words, the participants agree that most of the literature consulted presents a weak relationship between occupational risks and workers' perceptions (Figure 1).

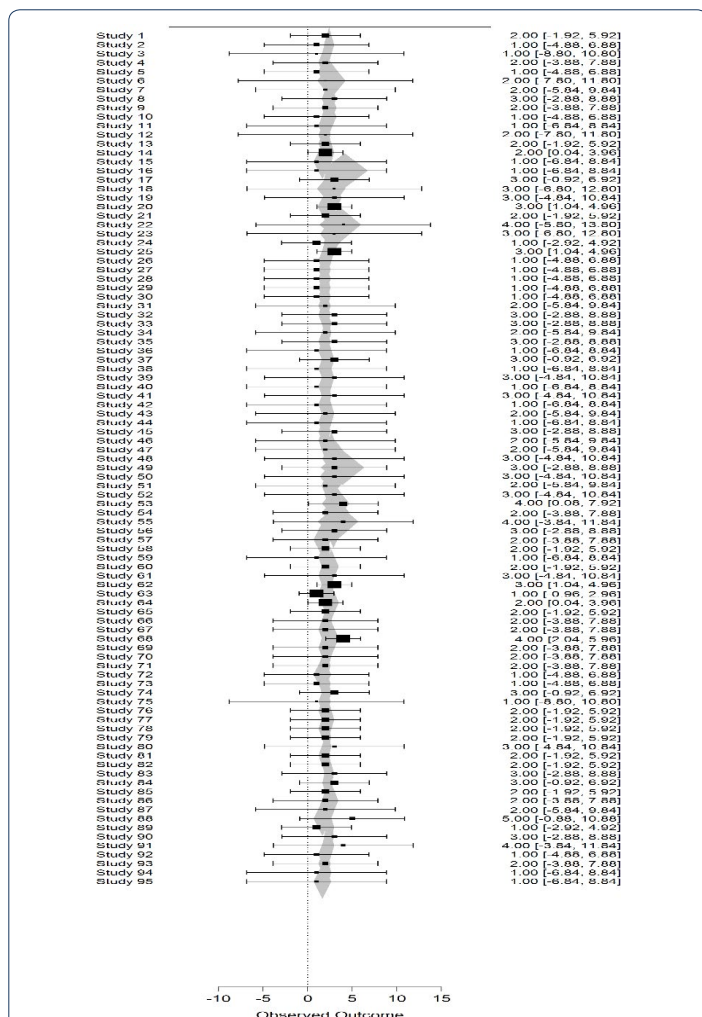


Figure 1 Graphs of occupational risks in the published literature from 2019 to 2022 Source: Prepared with data from the study.

Regarding illnesses and accidents, the judges' evaluations note weak connections between the reviewed literature and the theories that explain occupational hazards. Therefore, the results show a research network that informs the relationship between occupational risks and the perception of employees, but the judges who evaluated these relationships warn that such contributions would not be related to the exposed theoretical framework. Four of the summaries evaluated by the judges were considered extremely important for the specification of a perceptive model around occupational risks (Figure 2).

The expert judges in labor risks assume that only four of the summaries evaluated account for the phenomenon. The expert judges assume that the relationship between accidents and diseases is significant with respect to biosafety derived from the pandemic (Table 4).

Source: Prepared with data from the study. Wail's test : $z = 3.334$; $p < 0001$; Adjustment measures: AIC = 384367; BIC = 394,455; $T2 = 0.000$; $T = 0.000$; $I2 = 0.000$; $H2 = 1000$

The judges consider that this network of relationships could be modelled as a robust structure in the prediction of risk scenarios in the face of Covid-19. The judges suggest that these four findings reported in the literature reflect situations of risk prevention, both accidents and diseases. The profusion and connectivity of the judges' assessments warns of the predominance of non-significant relationships, although the rest of the findings tend to be integrative [16].

Table 4. Descriptives of the meta-analysis of occupational risks published in the literature from 2019 to 2022.

	what	df	p
Coefficients	2,434	two	0.296
Heterogeneity	11,732	92	1,000

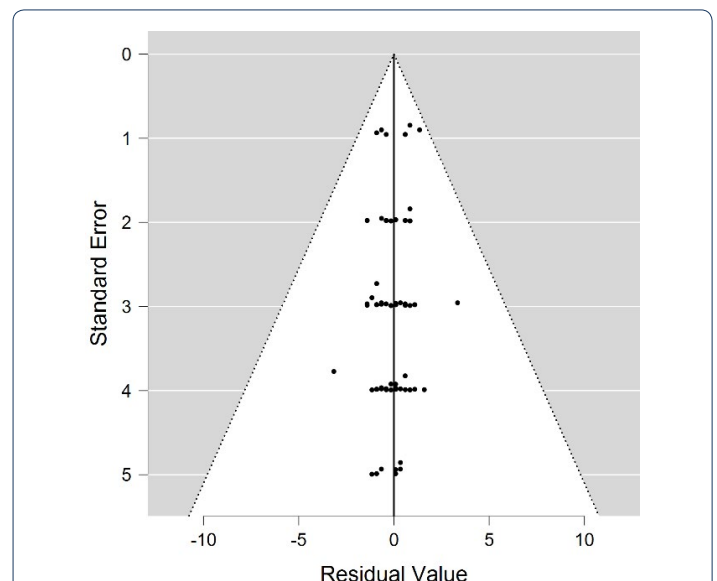


Figure 2 Occupational risks published in the literature from 2019 to 2022 Source: Prepared with data from the study.

Discussion

The contribution of this work to the state of the matter lies in the specification of a model for the study of the perception of occupational risks in the era of Covid-19. The results show that the findings reported in the literature were evaluated as not very significant by expert judges. In relation to the literature consulted where illnesses and accidents stand out as central axes of risk perception, the present work corroborates such a question. Regarding the theoretical and empirical frameworks that highlight the differences between occupational risks and risk perceptions, this article corroborates these findings. Regarding the explanation that the perception of risks revolves around specific and contingent situations, the present work corroborates this assumption. Regarding the approach of prospective decisions in the face of risk events to maximize profits, this article discusses this hypothesis. It is true that decisions in risk situations are increasingly fortuitous, but the judges surveyed assume that illnesses and accidents reported as objects of perception are not very significant. That is, the judges consider that the prospective decisions are generated from risks that have not been reflected as accidents or illnesses.

Risk perception theory assumes that events are incalculable in their effects, unpredictable in their occurrence, and uncontrollable in their magnitude (Šanc & Prosen, 2022). The present work agrees with these axes of discussion and theoretical matrices. The systematic review of the study suggests that the findings reported in the repositories consulted during the pandemic are within the thresholds of homogeneous random effects. That is, the political decisions of communication and risk management can include the cited literature to guarantee the prevention of risks.

Based on the theoretical approach to risks, the research that corroborates the approaches to the phenomenon suggests that risks are associated with trust in science and technology (Gil & Gil 2010). The present work suggests that chance does not affect the findings reported in the literature. It means then that the literature recovers contributions that serve to design risk management policies. In this sense, the relationships between risk perception with self-efficacy and technology acceptance explain the governance of risk events.

Risk perception modeling included the impact of technology on confidence in risk control (Nasir et al., 2015). The present study suggests that risk control has been consistent in the literature that presumes a regularity in terms of its association with perceptions of trust and usefulness. Policies that include trust in science and technology may be more widely accepted than those faced by academic institutions or universities.

The lines of investigation regarding occupational risks after

the lack of confidence will allow the judges' assessments to be corroborated. The reactivation of the economy and the return to work will make it possible to alert about occupational health risks. Accidents and illnesses as occupational risks were qualified as an area of opportunity by the judges. Therefore, occupational risks can be seen as reflections of occupational biosafety. Risk management from the prevention of accidents and diseases will contribute to the theories that explain them. Studies alluding to occupational risks can contribute to theories based on the explanation of perceptions.

Conclusion

The objective was to specify a model for the study of occupational risk perceptions in the Covid-19 era. A structure of relationships was found between the findings reported in the literature regarding the assessments of expert judges. The criteria of the judges were established from a position of "not at all in agreement" to "quite in agreement" for the qualification of the findings. The comparison of the average of the qualifications with the initial evaluations allowed moving towards a reconsideration. The judges' evaluations were different in each round. The judges' criteria opened the discussion around the profusion and connectivity of the findings reported in the literature during the pandemic to date. From this study it was possible to notice biosafety policies focused on diseases and accidents as axes of the research agenda.

The design of safety policies in the workplace can be carried out based on the established findings. The systematic review of the results published during the pandemic suggests that workers develop a perception of risk based on information from the environment in the media and networks. The distinction of the source is not heterogeneous. That is, workers receive and process information based on their expectations of risk. Perceptions of contagion, illness or death from COVID-19 are indistinct from the type of source and message. Therefore, prevention policies are oriented towards self-care as a complement to trust in science and technology. In the case of care for cases of atypical pneumonia, adherence to treatment is related to risk communication that minimizes the pandemic or equates it with influenza.

The lines of study that emerge from the findings and their confrontation with theoretical, conceptual and empirical frameworks suggest a propensity for risk if trust in science and technology remains constant while the pandemic continues. Another aspect of the research is related to the observation of indicators to reveal the reflection of risk perception in audiences of workers who take their health as a priority and develop self-care, or workers who are viewers of the media and networks that adhere to an anti-COVID-19 treatment from surrounding information on immunization.

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