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By Arturo Sanchez Sanchez & Cruz Garcia Lilies

University of Tlaxcala

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

Arturo Sanchez Sanchez ^α & Cruz Garcia Lilies ^σ

Abstract- The target of the work was to review the literature on the perception of occupational risks during the pandemic. A documentary, cross-sectional and systematic investigation was carried out with a selection of sources indexed to international repositories, considering the period from 2019 to 2022. A network of profusion and connectivity was found that explains the differences and perceptual similarities around occupational risks. Relation _ to biosafety policies, the adjustment of the model is recommended to be able to anticipate decisions and behaviors determined by expectations against or in favor of occupational accidents and illnesses.

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I. INTRODUCTION

U ntil March 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 number of deaths could increase to 20 million. In this scenario of risks of contagion, illness and death, the mitigation and containment policies for the pandemic consist of the strategies of distancing, confinement and social immunization (García, Carreón and Hernández, 2016 a: p. 103). In the case of organizations and institutions, biosafety 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 ventilation of closed spaces and the immunization of people, discarding the expectations of the workforce and workforce (García, 2021a: p. 45). In this sense, a review of the state of the art suggests that the type of employment corresponds to occupational health (García, 2019a: p. 10). In this way, jobs with high risks such as the cleaning service are limited to three years due to the deterioration of occupational health (García, 2021c: p. 5). In this relationship between the type of employment and the level of occupational health, the migratory condition aggravates the situation (Hernández et al., 2021: p. 11). Therefore, if employees in the

cleaning and occupational hygiene sector are migrants, they are willing to take more risks compared to native workers (García, 2019 c: p. 27). In this way, migratory flows adopt risk behaviors in which they decide to assume more costs than benefits due to the lack of job opportunities for undocumented immigrants.

Regarding the gender perspective, migrant women are exposed to greater risks compared to men, since traveling by public transport to the workplace involves higher levels of stress, exhaustion and frustration (García, 2018: p. 10). In addition, the payment is lower than their male counterparts, as well as the exposure to workplace violence due to their gender condition, as is the case of the non-recognition of their work.

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 impacted occupational health through exposure to risks of contagion, illness or death, as well as through the media and electronic networks via information disseminated on anti-COVID-19 policies. 2) The anti-COVID-19 policies focused their strategy on the distancing and confinement of people, transforming work activity into a family setting. 3) Risk communication as part of anti-COVID-19 policies determined personal strategies for the use of devices such as masks, alcohol gel or face shields. 4) Anti-Covid-19 policies were disseminated through risk communication. 5) The increase in infections, illnesses and deaths from COVID-19 spread in the media and electronic networks contravened the communication of risks that consisted of the mitigation and containment of the pandemic. 6) The differences between the news and the official version affected the perception of risks. 7) A significant contradiction between the media version and the official version affected the increase in risk perception and the intensive use of masks and face shields. 8) A concatenation between the ruling party and mediatization generated

Author α: Department of Economics, Autonomous University of Tlaxcala, Mexico.

Author σ: Department of Social Work, Autonomous University of the State of Mexico. e-mail: bundestrans@aol.com

flexibility in the use of masks and masks. 9) The literature that observed both processes established significant differences and anticipated high-risk scenarios in cases where officialism and mediatization converged.

II. RISK PERCEPTION THEORY

The theoretical and conceptual approaches that explain occupational risks are: 1) risk perception theory, 2) prospective decision theory and 3) job expectations theory. These are theoretical perspectives that explain the impact of mitigation and containment policies, biosafety programs and prevention strategies in the workplace.

Risk perceptions, understood as the expectation of costs and benefits around external demands and internal resources to organizations, suggest that accidents and illnesses can be anticipated (García, Bustos and Juárez, 2020: p. 20). In a risk scenario such as the pandemic, risk perception is triggered by expected gains and losses in the face of a labor decision or action. An increase in accidents and illnesses reflects an increase in risk propensity (Van Gesel et al., 2007). A reduction in costs and benefits implies an aversion to risks (Carreón et al., 2017: p. 33). 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 (García, 2019 b: p. 5). The contribution of the perceptual 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 by implementing distancing, confinement and immunization strategies limit the workplace and reorient it towards biosafety guidelines (García, 2021d: p. 137). In this situation, the theory of prospective decisions explains the relationships between leaders and talents in the face of contingent events (Molina et al., 2019: p. 10). The theoretical approach raises differences between those who make decisions and those who abide by them (Amemiya, Bustos and García, 2018: p. 45). In this hierarchy, leaders make decisions minimizing the expectations of their workers (García et al., 2017: p. 231). This is the case of prospective decisions that consist of accepting high costs to obtain greater benefits (García et al., 2016 b: p. 270). Such managerial decisions can be supported by the workers as long as they perceive a spread of profits.

However, if the 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 (Soto and Homazabal, 2009). The job expectations approach suggests that this

distrust can be generated by the absence of objectives and goals (Sánchez et al., 2019: p. 9). Or, mistrust can emerge from investment in technology that is associated with layoffs or job rotations.

Risk perceptions explain that accidents and illnesses can be prevented if they are considered close to workers (García et al., 2018: p. 53). In a different sense, prospective decisions choose processes with high costs expecting greater benefits (García, 2021e: p. 52). In the midst of both proposals, job expectations are translated into confidence when workers notice preventive risk management based on the dissemination of benefits in the face of prospective decisions.

III. RISK PERCEPTION STUDIES

Theoretical and conceptual frameworks of risk perception assume that events are unpredictable, immeasurable, and uncontrollable (Peric et al., 2021). Based on these criteria, risk events are approached from the perception or expectation bias of those who are exposed and vulnerable.

In this way, risk expectations are divided into risk aversion and propensity (Quiros et al., 2020). In the occupational sphere, aversion is seen in the increase in self-care. If COVI-19 is considered a pandemic, then it leads to biases in life expectancy and increases prevention through the use of gloves, masks, and face shields. If it is assumed as a flu, then the assessments are oriented to the opposite pole and adherence to treatment is generated as long as it is associated with social support. It is possible to observe that migrants with high-risk jobs will match their levels of adherence to treatment with native professionals who do not have social or family support.

The risk perception indicators are a reflection of the degree of biased expectations towards an event such as the SARS CoV-2 pandemic (Rodelo, 2021). An increase in the use of contagion prevention devices correlates with an increase in the incommensurability of risks, although hopelessness also emerges as a provisional response. Helplessness is the result of repetitive risk events that nullify the self-care response. Consequently, the intensified and prolonged pandemic breeds hopelessness. On the contrary, if the event is attended to, it reduces defenselessness.

Risks are also the result of their determinants, as is the case with the perception of control (García, 2021b: p. 10). The emergence of self-control is the product of a high expectation of risk, but also of control experiences 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 nullified 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 (García, 2014: p. 81). If it is assumed that health professionals are carriers instead of mitigators of the pandemic, then it affects the perception of control and risks. On the contrary, if health care personnel are seen as life savers, then self-care is reoriented towards trust in health professionals and rehabilitation or adherence to treatment.

IV. MODELING OF RISK PERCEPTION

Theoretical, conceptual and empirical frameworks agree in assuming that the pandemic is a risk event that can be reduced in its effects if the media and communication networks spread a vaccine (Lugo et al., 2020). Immunization complements self-care and encourages adherence to treatment or rehabilitation. To date, the consistency of this formulation has not been reviewed.

Consequently, the modeling of perceptions or expectation biases in the face of a risk such as

contagion, illness or death from COVID-19 has not been clarified (Reinols et al., 2022). A model can be reflective if the objective is to know 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 reflective sense, the perception of risks can be appreciated from the biases of expectations or despair. In the case of the literature consulted, the expectations can be seen in the questioning of anti-COVID-19 policies. A considerable increase in criticism reflects a significant risk perception. A decrease in the use of devices such as masks, shields or gloves implies a political lack of confidence that translates into a propensity for risk.

V. METHOD

A documentary study was carried out with a selection of sources indexed to international repositories, considering the edition period from 2019 to 2022 (see Table 1).

Table 1: Descriptives of the Sample

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

Source: Prepared with Study Data

In order to be able 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 on the subject evaluated the results consulted in the public literature from 2019 to 2021 regarding occupational risks. The selection criteria of the expert judges were the h index of production in Google Scholar and the area of knowledge in labor sciences (see Table 2).

Table 2: Descriptions of the Expert Judges

Sex	Age	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	16

Source: Prepared With Study Data

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 (García, 2017: p. 379). In the third phase, the ratings based on the second round were reconsidered. Or, the expert judges reiterated their initial assessments, even when confronted with the average (see Table 3).

Table 3: Descriptive of the Evaluated Findings

	M	SD	χ^2	Df	P
R1					
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	15	.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	11	.03
Judge 3	4.35	1.21	16.57	14	.02
Judge 4	4.32	1.45	13.21	15	.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	13	.03
Judge 6	4.35	1.54	18.21	13	.06
Judge 7	4.67	1.36	14.35	14	.09

Source: Prepared with the study data, R = Evaluation round of the expert judges, R1 = Qualifying phase, R2 = Comparative phase, R3 = Reconsideration phase, M = Mean or average of the qualifications of the judges, 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 analyzes in order to test the null hypothesis regarding the differences between the reported findings and the ratings of the expert judges (Garcia, 2013: p. 363). The values were interpreted considering their proximity to the unit with the exception of the residual coefficients.

VI. RESULTS

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 an 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.

Regarding illnesses and accidents, the evaluations of the judges warn that weak connections between the reviewed literature and the theories that explain occupational risks. Therefore, the results show a research network that reports the relationship between occupational risks and employee perception, 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 perceptual model around occupational risks.

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 biosecurity derived from the pandemic (see Table 4).

Table 4: Descriptive of the Meta-Analysis of Occupational Risks Published in the Literature from 2019 to 2022

	Q	Df	P
Coefficients	2,434	Two	0.296
Heterogeneity	11,732	92	1,000

Source: Prepared with Study Data. Wail 'S Test: $Z = 3.334$; $P < 0001$; Adjustment Measures: $AIC = 384367$; $BIC = 394,455$; $T2 = 0.000$; $T = 0.000$; $I2 = 0.000$; $H2 = 1,000$

The judges consider that this network of relationships could be modeled 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 the situations of risk prevention, both accidents and diseases. The profusion and connectivity of the judges' evaluations warns of the prevalence of non-significant relationships, although the rest of the findings tend to be integrated.

VII. 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 Covid-19 era. The results show that the findings reported in the literature were evaluated as not very significant by expert judges. In relation to the consulted literature where illnesses and accidents stand out as central axes of risk perception, the present work corroborates such question. Regarding the theoretical and empirical frameworks that highlight the differences between occupational hazards and risk perceptions, this paper 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 paper discusses this hypothesis. It is true that decisions in situations of risk are increasingly haphazard, but the judges surveyed assume that the 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 during the pandemic fall within thresholds of homogeneous random effects. That is, the political decisions of communication and risk management can include the cited literature in order to guarantee the prevention of risks.

Based on the theoretical approach to risks, the research that corroborates the approaches to the phenomenon suggests that the risks are associated with trust in science and technology (Gil and 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 the perception of risks with self-efficacy and the acceptance of technology 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 regarding its association with perceptions of trust and usefulness. Policies that include trust in science and technology may be more accepted than those that confront academic institutions or universities.

Lines of investigation concerning occupational risks after the lack of confidence will allow the judges' evaluations to be corroborated. The reactivation of the economy and the return to the workplace will make it possible to warn of risks to occupational health. 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 biosecurity. Risk management from the prevention of accidents and diseases will contribute to the theories that explain them. Studies alluding to occupational hazards may contribute to theories from explanation and perceptions.

VIII. 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 evaluations 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 appraisals 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 so far. 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 occupational field can be carried out from the established findings. The systematic review of results published during the pandemic suggests that workers develop a perception of risk based on surrounding information in the media and networks. The distinction of the source is not heterogeneous. That is, workers receive and process information based on their risk expectations. 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 as the pandemic continues. Another aspect of research is related to the observation of indicators to reveal the reflection of the perception of risks in audiences of workers who assume their health as a priority and develop self-care. Or, workers who are spectators of the media and networks who adhere to an anti-COVID-19 treatment based on surrounding information about immunization.

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