Research Article

BIOMEDICAL Journal of Scientific & Technical Research

ISSN: 2574 -1241

DOI: 10.26717/BJSTR.2024.57.009078

Exploratory Factor Model of Water Supply Expectations in the COVID-19 Era

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ARTICLE INFO

Received: July 22, 2024

Published: August 02, 2024

Citation: Gilberto Bermúdez Ruíz, Arturo Sánchez Sánchez, Celia Yaneth Quiroz Campas, Cruz García Lirios. Exploratory Factor Model of Water Supply Expectations in the COVID-19 Era. Biomed J Sci & Tech Res 57(5)-2024. BJSTR. MS.ID.009078.

ABSTRACT

The objective of this work was to explore the structure of factors related to the perception of water availability from the parties involved. A non-experimental investigation was carried out with a selection of 248 residents of a town in northeastern Mexico. The reliability and validity of the WRPS-16 was established, which included two dimensions that explained 39% of the variance and were related to the aversion or delegation of responsibility to the State for the free supply of water and the dimension prone to risk to account for of negotiation and agreement with local governments. However, the type of study, sampling, and analysis limited the results to the research context, suggesting the inclusion of the hypermetropia factor that explains the lack of concern and inaction of future generations in the face of risk events and their effects. in the community.

Keywords: Pro-Environmental Behaviors; Natural Disasters; Water Availability; Interested Parties; Risk Perception

Introduction

The effects of climate change on the availability of natural resources and the quality of public services, as it is linked to environmental health, have led to four risk indicators: scarcity, shortages, unsanitary conditions and high prices (Manoiu et al. [1]). Often, local water problems have been approached from a bottom-up perspective where social actors in relation to their authorities build a public agenda, but the objective of this document has been to estimate the risk perception of both rulers and governed in a scenario of scarcity, shortage, unhealthy and expensive water service (Abu-Bakar, Williams & Hallett, et al. [2]). This is the stakeholder approach. or stakeholders whose differences and similarities converge in a governance or co-responsibility agreement (Lüdtke et al. [3]). It is these water problems that have been addressed from the social sciences as perceptions of rulers and ruled to explain their differences and similarities. Perception differs from other social processes in terms of biases to reduce or maximize probable threats and their effects on the health of stakeholders (Bhattacharya & Bose [4]). In this sense, the perception of risks also suggests that such a process is immeasurable and unpredictable. Consequently, water problems are seen as perennial (Pesantez et al. 2022). In this way, a scenario in which risk perceptions converge, both of the rulers and the governed, is oriented towards its amplification (Tortajada & Biswas, et al. [5]).

In other words, a problem that is not on the political and citizen agenda acquires its relevance in the future when the perceived reduction of its threat is gradually replaced by a catastrophic maximization (Elsaid, et al. [6]). In addition, this phenomenon known as social amplification of risk is accentuated in asymmetric cities in terms of their public services (Poch, et al. [7]). Areas with high availability reduce their risk perceptions and marginal areas maximize them (Braga, et al. [8]). In such a way that it is these niches excluded from water services that anticipate the most probable scenarios of scarcity, shortag-

es, unhealthiness and shortages. In cities with wide media coverage of water risks, the social amplification of risk is reversed as areas with high availability move towards a post-materialism in which saving water combines with a high perception of risk, but in marginalized areas the dissemination of environmental catastrophes suggests the waste of water no longer for reasons of abundance but for despair (Zechman Berglund, et al. [9]). That is, the distance or proximity of an event through the media generates a high perception of risk (farsightedness) and inaction (Muduli, et al. [10]). In this way, a phenomenon of water availability is processed from the personal, collective and media experience of scarcity, shortages, unsanitary conditions and high prices (Desye, et al. [11]). Studies have shown that such a process leads stakeholders, rulers and the ruled to inaction.

Studies of risk perception in general have shown that risk events such as landslides, floods, droughts, fires, earthquakes or subsidence are the result of absent or deficient civil protection, as well as a propensity to take decisions and actions. risk-oriented (Sivakumar, et al. [12]). In the case of water resources and services, the perception of risk has been associated with risk events such as shortages, shortages, unsanitary conditions, and shortages, highlighting their impact on community health, mainly in vulnerable sectors such as infants whose deaths they are around a million per year for the consumption of waterborne diseases. However, the aforementioned studies do not distinguish areas of local development that determine the sustainability of the supply and collection system (Cooper, et al. [13]). This is the case of urban peripheries where water problems are associated with risk events, leading to a scenario of current risks that can be observed in the future in urban centers and rural areas (Neal, et al. [14]). In cities, prospective studies have shown a declining supply availability per person that is correlated with austere lifestyles and austerity policies, as well as substantially increased rates, the proliferation of diseases through vectors such as malaria. The main challenge facing the management and administration of water resources and services is not only the prevention of diseases and the strengthening of a public and community health system, but also the differentiation between urban and regional centrality (Yunus, Masago & Hijioka, et al. [15]).

Risk perception studies have focused their interest on the establishment of a joint governance system in which civil society participates in decision-making in preventive health institutions (Bhowmick, et al. [16]). In this sense, it is that the reliability and validity of the instruments that allow diagnosing the trust of citizens with their authorities in terms of supply, quality and rates, not subsidies and forgiveness, is essential to anticipate scenarios of conflicts and agreements. However, the instruments that have been used to measure risk perceptions have disconnected risk events with the consequences for the health of the community and their impact on the preventive decisions and lifestyles of the inhabitants (Cooley, et al. [17]). The inclusion of environmental, perceptive, dispositional and administrative determinants in decision-making and preventive risk actions is essential to achieve the sustainability of co-management between political and social actors, as well as between the public and private sectors (Warner, Zhang & Rivas, et al. [18]). It is a governance system in which civil participation goes beyond an opinion survey or a consultation on their intentions to vote in favor of inclusive proposals in the water supply and collection system (Aguayo and Lirios, et al. [19]). It is necessary to link civil protection strategies with lifestyles based on the risk of low water availability and the local capacity to collect, store and treat wastewater (Chu, Fang, Deng & Xu, et al. [20]). In each category, risk perceptions are different if urban centers are compared with recreation and convenience of water relative to urban peripheries with scarcity, lack of sanitation, and scarcity.

The objective of this work was to establish the reliability and validity of an instrument that measures the perception of risk in relation to municipal water resources and services in situations of scarcity, shortages, unsanitary conditions and shortages. Are there significant differences between the theoretical dimensions of risk perceptions with respect to the relationships between the observed factors and indicators? The premises that guide the study suggest that there will be significant differences between the theoretical dimensions with respect to the empirical dimensions. about the perceptions of the risks derived from the local supply and collection system (Anim & Ofori -Ascent, et al. [21]). There will be no significant differences between the theoretical dimensions of risk perceptions and the relationships between their factors and indicators to be observed as long as the factorial structure reduces their total explained variance and suggests the inclusion of other factors.

Method

A non-experimental, cross-sectional and exploratory study was carried out with a non-probabilistic selection of 248 residents (M = 35.2 SD = 12.3 age and M = 9'982.00 SD = 456.34 monthly income) from a municipality in northeastern Mexico, considering the scarcity, scarcity, lack of health and local scarcity. The water risk perception scale (WRPS-16 for its acronym in English) was built, which includes three dimensions related to risk aversion and risk propensity before storage, optimization and reuse promoted by the municipal government. Participants were surveyed at their place of residence or work, with a written guarantee of confidentiality and anonymity, as well as a warning that the study results would not affect their status. The information was processed in IBM-SPSS-AMOS version 25.0. Cronbach 's multivariate alpha and the parameters of adequacy, sphericity, validity, adjustment and residual were estimated for the contrast of the null hypothesis.

Results

The internal consistency values of the general scale and the subscales that exceeded the required minimum of 700 (general alpha of 789, aversion alpha of 780, and propensity alpha of 785). Adequacy (KMO =, 783), Sphericity (X 2 = 346.32 (34gl) p = 0.000). The extraction with principal axes and promax rotation included two fac-

tors: risk aversion with 24% of the total variance explained and risk propensity with 15% of the total variance explained (Table 1). Once the constructs that explained 39% of the total variance were established, the null hypothesis was tested in relation to the significant differences between the theoretical dimensions of risk perception with respect to the factors and indicators found (Table 2). The adjustment and the residual parameters [X 2 = 567.32 (45gl) p =, 009; IFC =, 990; GFI =, 995; RMSEA =, 009] suggests not rejecting the null hypothesis, although the total variance suggests the inclusion of another factor that the literature identifies as hyperopia to demonstrate inaction against risk events and both global and local water problems (Table 3).

Table 1: Sample adequacy.

	MSA
Overall MSA	0.649
r1	0.677
r2	0.828
r3	0.672
r4	0.724
r5	0.742
r6	0.634
r7	0.325
r8	0.665
r9	0.81
r10	0.633
r11	0.678
r12	0.426
r13	0.566
r14	0.652

Note: Source: Prepared with study data.

Table 2: Factor weights of water supply expectations.

	Factor 1	Factor 2	uniqueness
r1			0.95
r2	0.897		0.195
r3		0.774	0.324
r4		0.511	0.59
r5	0.887		0.203
r6	-0.775	0.566	0.116
r7			0.931
r8	-0.799		0.352
r9		-0.832	0.263
r10			0.854
r11	0.513		0.589
r12	0.444		0.794
r13	-0.472		0.772
r14		-0.963	0.073

Note: Applied rotation method is promax.

Table 3: Factor Characteristics.

	SumSq . Loadings	ratio var .	Cumulative
Factor 1	3,958	0.283	0.283
factor 2	3,037	0.217	0.5

Note: Source: Prepared with study data

Discussion

The contribution of this work to the state of the art lies in establishing the reliability and validity of an instrument that measures risk perception, but the type of non-experimental study, the type of non-probabilistic sampling and the type of exploratory analysis limited the results to the research scenario, suggesting the inclusion of the hypermetropia factor to explain the lack of concern and inaction before risk events and their effects on public health. Local water governance depends on the reconciliation of uses and customs, rather than the implementation of water supply and comfort strategies that involve a consumption of more than 200 liters per person (Kalbusch, et al. [22]). In the present work it has been highlighted that the uses and customs only generate aversion to risks in the best of cases, but the clientelist relationship between the marginalized sectors with their authorities rather develops risk perceptions associated with the propensity or delegation of responsibility to the government, a prelude to the lack of concern and inaction in the face of risk events and their effects on public health. Co-management may be indicative of co-governance, although the increased risk appetite suggests that, at best, solidarity among stakeholders will be observed (Campos, et al. [23]). In the present study, cooperation would be related to an aversion to risks when the actors are willing to carry out joint efforts to carry out the tequio or guatza main uses and local customs of dosage of water consumption. The models for the study of local governance started from the assumption that self-management and technology would be sufficient for the establishment of co-management (Armitage & Nellums, et al. [24]).

In the present work, co-management replaces civil self-management and state self-management, since the propensity for risk implies the exclusion of civil actors towards politicians or vice versa. It is necessary to include hyperopia for the study of local water governance and sustainability if differences between urban centrality and periphery prevail (Heaviness JE, et al. [25]) [26].

Conclusion

The objective of this work has been to establish the reliability and validity of an instrument that measured two dimensions of perception and the risks related to the aversion or delegation of the problem to the political or social actor, as well as the dimension of the propensity involved in negotiation and agreement between the parties, but the type of study, sampling and analysis limited the results to the research scenario, which suggests the inclusion of the hypermetropia factor to explain the effect of risk events on the mental health of the locality that would be characterized due to lack of concern and inaction regarding the problems of scarcity, unsanitary conditions and lack of water service.

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ISSN: 2574-1241

DOI: 10.26717/BJSTR.2024.57.009078

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