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An Evaluation on Dust Phenomenon and the Coping Appraisal among Cardiovascular Patients

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Study Area: Ahvaz, Iran

Coordinates: 31°19'13"N; 48°40'09"E

Ethical standards have been met with informed consent, the right to withdraw from the investigation and confidentiality of personal information. Ethical code #- IR.SSU.SPH.REC.1396.36

Introduction:

One of the most remarkable effects of climate change in recent years is the increase of dust storms that directly and indirectly affect the various sectors of the community (Khazanehdary, 2009). Iran has been faced with the dust phenomenon for several years and it is only due to the adjoining a large part of the desert areas. One of the regions of Iran affected by this phenomenon is Khuzestan province in the southwest of the country (Zarasvandi *et al.*, 2011). Unfortunately, with the onset of dust, the visits to the Ahvaz medical centers rose by 70% (Shahsavani *et al.*, 2011).

Air pollution is one of the most crucial health issues, exerts adverse effects on health (Chen & Kan, 2008). Dust

Abstract

One of the remarkable effects of climate change in recent years is the increase of dust events which threatens many developing countries, including Iran. The present study was conducted to evaluate the coping appraisal of cardiovascular patients with the risk of dust exposure which was conducted on twenty-eight cardiovascular patients. Semi-structured interviews with open questions and inspiration from coping appraisal constructs were used to collect data. All data was captured and handwritten and analyzed using MAXQDA-10 software and in-depth analysis. Using coping appraisal constructs, 6 Category and 12 Sub-Category were extracted; including the empowerment of cardiovascular patients to avoid dust exposure (ability to use risk reduction devices, ability to adapt to bad environmental conditions, ability to avoid dust exposure), personal benefits (physical benefits), social benefits (Participation in community health, Contributing to keeping of community resources), individual barriers (mental problems, physical problems), economic barriers (economic problems), environmental and social barriers (problems to access risk reduction equipment, social problems, environmental problems). This study provided a clearer picture of coping appraisal to the risks of dust exposure in cardiovascular patients; therefore, these results help planners develop the most appropriate methods and strategies to design and implement intervention programs to raise awareness of community members and especially cardiovascular patients with emphasis on enhancing self-efficacy and response efficacy and reducing response costs.

Key words: Dust Storms, Protection Motivation Theory, Susceptible population

particles have very small dimensions, thus entering the end of the respiratory tract and then entering the bloodstream and damaging the organs of the body and causing cardiovascular and respiratory diseases. Increasing suspended particles can have a significant relationship with an increased risk of cardiovascular disease. Thus, the effects of cardiovascular disease caused by air pollution are responsible for 30% of deaths worldwide. These effects also lead to increased costs and lower quality of life for individuals (Mohamadi & Kaviannejad, 2017), and symptoms such as inflammation of eyes and respiratory tract, especially in vulnerable beings such as babies, children, the elderly, pregnant women, cardiovascular

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ORIGINAL ARTICLE

patients, and patients will have respiratory tract (Bennion *et al.*, 2007). Qualitative methods of analysis can help educators to understand better the complete health problems its behavioral and respective environmental causes, and determinants from the viewpoint of the people who have a problem (Farquhar *et al.*, 2006). Several studies have been carried out using qualitative methods, and some of them using educational theories and models, such as risk perceptions of dust and its impacts among communities living in a mining area (Wright, 2014), the experiences of patients' close relatives with risk factors of gastric cancer and health-therapeutic personnel from the determinants of nutritional behaviors (Baghiani Moghadam *et al.*, 2016), and experiences of high school students about the predictors of tobacco use (Ghasemi & Sabzmakan, 2015) are some of the prominent ones. But how far the dust issue are concerned, studies are very limited, and existing studies have been conducted descriptively (Albushoka *et al.*, 2013; Ramezankhani *et al.*, 2014).

Theories provide valuable tools for understanding and solving a wide range of behavioral problems. Health behavior theories are very important for understanding behaviors and interventions with the goal of increasing health issues (Noar, 2004). The protection motivation theory, introduced by Rogers (1975) has been widely accepted as a framework for prediction and intervention in health-related behaviors. The concept of the response efficiency is the expectation of the person that the coping response can reduce or eliminate the threat (Graneheim & Lundman, 2004); self-efficacy also means that individuals are assured of their ability to perform well-behaved and recommended behaviors (Adib-Hajbaghery *et al.*, 2006; Polit & Beck, 2006). Response costs are the total barriers that reduce preventive behaviors, including financial and non-financial costs, such as lack of time or loss of time, discomfort, etc. Increasing the cost of carrying out recommended health behaviors can reduce the protection motivation and consequently reduce behavior (Adib-Hajbaghery *et al.*, 2006).

Thus, considering the necessity of recognizing the experiences of cardiovascular patients in understanding the coping appraisal posed by risks of dust exposure and limiting similar studies, especially qualitatively, and based on the theory, this study was aimed to examine the experiences of cardiovascular patients from coping appraisal of the risk of exposure to the dust phenomenon.

Methodology:

Study design: qualitative content analysis conducted between, January to June 2018. A total of 28 cardiovascular patients, referred to urban healthcare centers in Ahvaz as per routine national Package of Essential Non-communicable Disease (IRA-PEN) check-up. PEN is a tool provided by WHO for primary care in low-resource settings to enable early detection and management of

cardiovascular diseases, diabetes, chronic respiratory diseases, and cancer.

Semi-structured interviews with open questions and inspiration from coping appraisal structures were used to collect data. All data were obtained through handwritten and analyzed using MAXQDA-10 software and in-depth analysis.

Participants and sampling: the selected group was vulnerable due to their illness and involved in the interviews to provide their experiences. Participants were selected through targeted sampling among clients referring to health centers that were referred to the cardiovascular disease risk and approved by their respective physicians. Our sampling maintained diversity in terms of age, sex, ethnicity, education, place of residence and exposure to hazards in a targeted way. Subjects with a confirmed diagnosis of cardiovascular disease living in Ahvaz at least one year before study and having the ability to express their experiences.

Interview, Data collection, and Interview Guide: the data collection in the present study was perceived by a semi-structured, in-depth interview with a semi-open interview questionnaire and based on coping appraisal structures. The questions asked in the interview were: i) What are the effective methods for preventing dust exposure? How they would benefit you? ii) Do you like to use mask and air purifying devices? iii) Why people do not take risk reduction to dust exposure? iv) What do you do to overcome the barriers to preventing of dust exposure? i) Is it expensive for you to avoid dust exposure? vi) In your opinion, dust exposure can reduce your quality of life? vii) What is the opinion of others, like your family and friends about the dust exposure? viii) What factors or people involve you towards dust exposure? ix) Your ability to avoid dust exposure? x) What factors help you to increase your ability to reduce the risk of dust exposure?

During the interviews, the main focus was on the participants' descriptions of their experiences. Queries were also included like; you give an example? How? And explain more? To clarify and resolve ambiguities and to deepen the responses. Interviews lasted between 11 until 41 minutes. The interviews were recorded as handwritten documents and encoded as soon as possible to provide feedback on the adequacy and data saturation. Interviews continued until data saturation, which means duplication of data. The 4th interview was conducted to confirm information saturation. Two of the invited people were not interviewed, and some of the inaccuracies of some responses were also checked by phone.

Data analysis: performed on the basis of qualitative content analysis according to Graneheim & Lundman (2004), the stages include; complete the entire interview, immediately after completing each interview read the entire text for a complete overview of its content,

determining the units of meaning and primary codes, classification of similar primary codes in more comprehensive classes and determining the main theme of the classes. In order to extract the themes, the text of the interviews was broken down line by line and the units of meaning were extracted, which are the first level codes. Then, based on their similarities and differences, the initial codes were sorted and again they were categorized into larger categories, where the main themes explaining each construct were identified.

Scientific trustworthiness of the results: in order to ensure the accuracy and robustness of the data, Guba and Lincoln's criteria were used to ensure the acceptability, reliability, reliability, and transmission capability (Adib-Hajbaghery *et al.*, 2006). The long-term participation of researchers with participant and allocation of sufficient time to collect data and also the active participation of other members of the research team in addition to the main researcher has helped in data collection capability, analysis, and interpretation of data in all phases. Also, the full text of a number of coded interviews was provided to the participants to evaluate the adaptation of the concepts to the participants. Therefore, some participants were asked to compare the code assigned to the interview content with the original text and to agree or disagree with the scholar's proper perceptions of their speeches. To evaluate the reliability of the data, the researcher immediately after the interviews implemented the data and properly interpreted, in addition to being profited from the notes during the discussion or interview, non-verbal behaviors were also considered. The texts of the interviews and notes were also reviewed and re-coded several times. The results of the first coding were compared after each interview encoded with previous samples compared and, whenever felt necessary, changes were on the way to achieving common codes, capability data Trust was made. Finally, in order to increase the transmission capability, all the research processes were prepared in a clear and accurate manner and stored and maintained for their files in order to allow others to follow the research pathway and the characteristics of the population studied.

Results:

In the present study, 28 people participated (16 males and 12 females), with the highest age ranging from 47 to 61 years (Table-1). The primary codes of data analysis were 120 cases; which after analyzing, all of these initial codes were placed in 12 subcategories and 6 categories (Table-2).

Perceived self-efficacy: theme included a core category; the empowerment of cardiovascular patients to avoid dust exposure, and three sub-categories; the ability to use risk reduction equipment and devices, the ability to adapt to bad environmental conditions, and the ability to avoid dust exposure. Participants expressed their experience in

dealing with dust exposure with the following phrases:

- ♦ The government will help, and give these devices to us; we use them. (Participant# 3).
- ♦ When our health status is affected, for our health I do not go out of the house. I care about myself. (Participant# 24).
- ♦ As long as I have the ability, I will not go out. (Participant# 4).
- ♦ It is best for a person to be as capable as possible and to get away from the soil; it is better for his health. (Participant# 6).

Table 1: Demographic variables of the participants

Variable	Class	N/%	Class	N/%
Age (years)	32-46	6/ 21.42	47-61	13/46.42
	62-77	9/32.14		
Sex	Male	16/57.14	Female	12/42.85
Ethnicity	Arabs	10/35.71	Bakhtiari	11/39.28
	Lor	2/7.14	Fars	5/17.85
Literacy	Illiterate	3/10.71	Elementary	8/28.57
	Guidance	8/28.57	High school	4/14.28
	Academic	5/17.85		
Occupation	Worker	4/14.28	Employee	4/14.28
	Farmer	1/3.57	Housewife	9/32.14
	Retired	8/28.57	Free job	2/7.14

Perceived response efficacy: theme included two main categories; personal benefits and social benefits, along with three sub-categories; physical benefits, participation in community health and contributing to keeping of community resources. Participants expressed their experience about dust exposure with the following phrases:

- ♦ We put on a seal, which at least prevent the dust from entering the inside of the house. & People can stop the dust by planting trees. (Participant# 1).
- ♦ In my opinion, the best way is not to go out of house. (Participant# 17).
- ♦ Use the mask if you want to come out of the house, especially filtered masks. (Participant# 21).
- ♦ I'm sure to use the mask. I, my child and my wife are using the mask if there is dust. (Participant# 24).

Perceived response cost: theme included three main categories; individual barriers, economic barriers, and environmental and social barriers, with six sub-categories; mental problems, physical problems, economic problems, problems to access to risk reduction equipment, social problems and environmental problems. Participants expressed their experience about dust exposure with the following phrases:

- ♦ When I use mask, my face warms up; it seems to be steaming and hate it. (Participant# 27)
- ♦ The person cannot be in prison at all. In the home there's a bit of a mood for humans. (Participant# 17)
- ♦ Some people go out like this; well, it's out of pride. (Participant# 17)
- ♦ Some are choked; they cannot use a mask, my husband is like this. Yeah, they are strangled, their breathing is not good. (Participant# 4)
- ♦ Cost! For example the time we lose and stay home. And; we our job are free, and then we are pushing us. The financial cost presses us. Disease also makes us difficult; we have to go to doctor, laboratory, and these are also costs. (Participant# 7)

ORIGINAL ARTICLE

- ♦ The hospitalization, buy of drugs, the echo, or the ECG, it costs a lot. For example, i was hospitalized three or four times and suffered a lot costs. (Participant# 3)
- ♦ Suppose we prepared double-glazed windows and suitable doors, it's very expensive. Air purification devices also have high costs. (Participant#1)
- ♦ The government does not distribute the mask; if you distribute 10 masks, they will distribute them in a way that does not make any difference. (Participant#16)
- ♦ We go to the health center, we do not have masks; we go to the pharmacy to buy a mask, they say, they have no mask. (Participant# 2)

Table 2: Coping appraisal of cardiovascular patients about risk reduction of dust exposure

Category	Sub-category
Theme: Perceived self-efficacy	
Empowerment of cardiovascular patients to avoid dust exposure	Ability to use risk reduction equipment and devices Ability to adapt to bad environmental conditions Ability to avoid dust exposure
Theme: Perceived response efficacy	
Personal benefits	Physical benefits Participation in community health
Social benefits	Contributing to keeping of community resources
Theme: Perceived response cost	
Individual barriers	Mental problems Physical problems
Economic barriers	Economic problems
Environmental and social barriers	Problems to access to risk reduction equipment Social problems Environmental problems

Discussion:

The findings of this study were conducted to investigate the experiences of cardiovascular patients from coping appraisal of the risk of exposure to the dust phenomenon. Following the methodology, we presenting the results as per the following heads.

Perceived self-efficacy: some participants understood the important role of the self-efficacy constructed correctly, and they said the government could help them provide air purification devices to use them; this can be very helpful in preventing people from high-risk behaviors. The study was consistent with Baghiani Moghadam *et al.* (2016), Farquhar *et al.* (2006), Ghasemi & Sabzmakan, (2015), Sharifirad *et al.* (2011). Therefore, considering the importance of self-efficacy in performing healthy behaviors, it is recommended to raise people's awareness, especially through mass media, to sensitize cardiovascular patients to the benefits of protective behavior. On the other hand, the positive and significant correlation between protection motivation and self-efficacy in the study of Melamed *et al.* (1996) also indicates the fact that any amount of belief in the person who can do the protective behavior against health

risks is greater; his intention is to do more.

Perceived response efficacy: we found, there is a great understanding of the benefits of not having high-risk behaviors related to dust exposure in cardiovascular patients. The most perceived benefit was to understand the effectiveness of using air purification, understanding the effectiveness of using a sealant between windows and doors, understanding the usefulness of leaving the house, understanding the usefulness of accessing and using masks, understanding the importance of using double-glazed windows. Based on the positive correlation between knowledge and perceived response efficiency, it can be said that the more knowledge of people about the health principles and their impact on preventing health problems and disorders, people are more likely to follow these principles (Yarahmadi *et al.*, 2013). Davati *et al.* (2006) also reported that educational programs could increase the knowledge of risk factors for cardiovascular disease.

Further, it could be recommended that training in reducing the dust exposure with the use of various educational techniques to increase the knowledge of individuals about the complications of dust exposure in cardiovascular patients and also be aware of the non-performing of high-risk behaviors.

Perceived response cost: implementing a coping response, there may be some perceived costs are hindering the implementation of coping behavior (Morowatisharifabad *et al.*, 2012). In this study, the most important reasons mentioned by the participants were economic barriers, reduce income, the possibility of dismissal from work and loss of time and rising financial costs have also been compounded by worsening heart disease. In Babazadeh *et al.* (2016)'s study, farmers also mentioned the reasons for not wanting to use protective behaviors, the financial costs and the time-consuming adoption of these behaviors. Mohsenipouya *et al.* (2017) also mentioned most of the perceived barriers by students to prevent cardiovascular disease were time-consuming and high costs. Other problems, which have led to inadequate behavior among participants, are individual barriers including; steam in front of face while using mask, feeling of choking, create a sense of boredom and being reprimanded by those around. Taheri *et al.* (2018) reported in their study conducted on farmers that, in addition to damaging the health of farmers, dust also affects them mentally.

A study on teachers by Ramezankhani *et al.* (2014) also mentioned the discomfort, shortness of breath and sweating of the nose while masking. Due to its qualitative nature, in our study, we focused more on the problem depth and identifying perceived coping, so its findings cannot be generalized as on other societies. Another limitation of this study was the low share of studies, both in Iran and other countries, which prevented the researchers from accessing such studies.

Conclusively, our results could help the planners to develop the most appropriate methods and strategies to design and implement intervention programs to raise awareness of community members and especially cardiovascular patients with an emphasis on enhancing self-efficacy and response efficacy and reducing response costs.

Acknowledgment:

The executives themselves are obligated to take all the people who have contributed to the implementation of this research, to thank and appreciate.

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