Assessing the Self-efficacy and Risk Perception of COVID-19 Among Cancer Patients Admitted to a Hospital in Ardabil-Iran

Somaieh Matin [1], Sajjad Narimani [2, 3, *], Vahideh Hosseini [4], Elham Zarehoseinzade [5] and Parisa Motamedi [6]

[1]Associate Professor of Gastroentrology and Hepatology, Department of Internal Medicine, School of Medicine, Lung Disease Research Center, Imam Khomeini Hospital, Ardabil University of Medical Sciences, Ardabil, Iran
[2]Department of Health in Disasters and Emergencies, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran
[3]Department of Nursing and Midwifery, School of Nursing, Social Determinant of Health Research Center, Ardabil University of Medical Sciences, Ardabil, Iran
[4]Alavi Hospital, Ardabil University of Medical Sciences, Ardabil, Iran
[5]Department of Infectious Diseases, Faculty of Alborz University of Medical of Sciences, Alborz, Iran
[6]Department of Gynecology, Ardabil University of Medical Science, Ardabil, Iran

Corresponding author: Department of Nursing and Midwifery, School of Nursing, Social Determinant of Health Research Center, Ardabil University of Medical Sciences, Ardabil, Iran. Email: sn.narimani@gmail.com

Abstract

Background: Cancer patients have defects in their immune systems due to chemotherapy and corticosteroid therapy and are at risk of viral diseases.

Objectives: This study aimed to evaluate the risk perception and self-efficacy related to COVID-19 among cancer patients in Ardabil, Iran.

Methods: This cross-sectional study was conducted on 200 cancer patients hospitalized in the oncology department of Ardabil Imam Khomeini Hospital in the summer of 2020, who were selected by simple random sampling. After obtaining informed consent, data was gathered using a questionnaire based on the extended parallel process model (EPPM) consisting of seven subscales, including perceived sensitivity, perceived severity, response efficacy, self-efficacy, intention, fear, and defensive motivation. The data were analyzed using linear regression by SPSS 18 and Stata 8.

Results: Mean age of 200 cancer patients in this study was 52.35 ± 6.30 years. Among the constructs of EPPM, perceived susceptibility (coefficient = 0.23, P-value < 0.001) and perceived severity (coefficient = 0.160, P-value = 0.026) were significant predictors of self-efficacy, while response efficacy, intention, fear, and defensive motivation were not significant. In the regression model, R squared (R^2) and adjusted R squared (adj-R^2) were 0.182 and 0.180, respectively.

Conclusions: This study demonstrated that perceived susceptibility and severity had significant roles in predicting self-efficacy. Therefore, it is proposed that according to the conditions of the cancer patients, health providers in oncology wards should provide the necessary information to enhance the risk perception regarding COVID-19 and promote self-efficacy to observe health protocols.

Keywords: Cancer, COVID-19, Risk Perception, Self-efficacy

1. Background

In December 2019, a new coronavirus was reported in Wuhan, China, and in less than four months, it swept the world (1). Since the beginning of the outbreak of the coronavirus, Iran, as a heavily inflicted country in terms of the number of patients and deaths caused by COVID-19 in the eastern Mediterranean region, has faced major challenges in controlling this disease (2). During the COVID-19 pandemic, all are at risk of this highly contagious disease (3, 4). Therefore, it is necessary for everyone to know the ways to prevent the disease and its signs and symptoms. But some people are at higher risk of developing the disease due to underlying diseases (5-7). Cancer patients have weak immune systems due to chemotherapy and corticosteroid therapy. Therefore, SARS Covirus-2 can easily infect these patients (8, 9). Consequently, more precautions should be taken when hospitalizing patients for chemotherapy and continuing nursing care even at home.

Human-to-human transmission of COVID-19 occurs by respiratory droplets or direct touch. Quarantining, physical separation, and isolation have become the main

ways to lower COVID-19 incidence and death. One of the tasks of healthcare providers during the current pandemic is to teach these clients how to provide self-care and how to increase COVID-19 risk perception (10, 11).

To ensure that people follow health protocols in dealing with COVID-19, we must ensure that our clients have perceived sensitivity and perceived severity to COVID-19. One of the models for examining risk perception and health behavior regarding COVID-19 is the extended parallel process model (EPPM). This model (EPPM) has four main factors to anticipate the possible consequence of communications which include a fear demand. Self-efficacy is the understanding that a person has the ability to perform the tasks necessary to control the risk. Response efficiency, which is a person's perception of action, if applied, can successfully minimize the risk. The perceived threat consists of two basic dimensions: Susceptibility (the person's belief in vulnerability to the threat) and severity (susceptibility to the importance or magnitude of the threat) (12-14). By assessing these constructs, the preparedness of individuals for training and self-protection is measured.

Previous studies have assessed risk perception in general populations (13-15). In this study, patients admitted to the oncology ward are studied for two reasons. Firstly, they receive immunosuppressive drugs, and secondly, patients in educational and medical centers may be infected by other patients or healthcare providers and develop COVID-19. It is assumed that in these patients, both the fear of the disease and the perceived severity are at the highest level.

2. Objectives

This study was conducted to evaluate the self-efficacy and risk perception of COVID-19 among cancer patients admitted to Imam Khomeini Hospital in Ardabil.

3. Methods

In this cross-sectional study, 200 patients were selected by simple random sampling among the patients admitted to the oncology ward of Imam Khomeini Hospital in Ardabil from July to August 2020. Data were collected using a COVID-19 risk perception questionnaire based on an EPPM. The questionnaire consisted of 42 questions in three sections. In the first part, general and demographic information was acquired by 16 questions. The second part consisted of 21 questions about COVID-19 risk perception, which evaluated seven subscales of EPPM, including perceived sensitivity, perceived severity, self-efficacy,

response efficacy, fear, defensive avoidance, and intention. Each subscale was evaluated with three questions on a five-point Likert scale. The third part included 5 questions about affording masks and alcohol.

The content validity of the instrument was assessed using the content validity ratio (CVR) and content validity index (CVI) via an expert panel including six health education specialists, three epidemiologists, and one oncologist. All questions were approved by experts, with the CVI of %92, 94%, and 86% for the first and second, and third sections, respectively, and CVR of 94%, 88%, and 88.6%, respectively. The reliability of the final version of the questionnaire was evaluated with 40 clients using test-retest measurement. Cronbach's alpha coefficients ranged from 0.75 to 0.90.

The interviewers attended the department by observing infection-control protocols and wearing protective equipment, and then the scales were distributed among them. Before collecting the data, the objectives of the study were explained to the patients, and a written informed consent form was obtained. Ethical approval was obtained from the Ethics Committee of Ardabil University of Medical Sciences (IR.ARUMS.REC.1399.164).

3.1. Statistical Analysis

Data were analyzed by SPSS-18 and Stata-8. Descriptive statistics were presented as mean (SD), or rate (%), for the evaluation of socio-demographic variables. We used multiple linear regression to determine predictors of self-efficacy as a dependent variable and other EPPM structures as independent variables. Requirements of regression were examined by several criteria. The scatter plot confirmed a correlation and linear relationship between the dependent variable and the independent ones. Durbin-Watson (DW) statistics were used to assess the autocorrelation of data and demonstrated that there was no autocorrelation between the data (DW = 2.014). Multiple linear regression was used to identify factors related to self-efficacy. In this study, a 95% ($P < 0.05$) significance level was adopted.

4. Results

In this study, 200 cancer patients hospitalized in the oncology ward of Ardabil Imam Khomeini Hospital participated. The majority of the participants were male (109, 54.5%). Also, 50% of participants had an age range between 51 and 60, 38% had a traditional education, 27% (n = 54) lived in rural areas, and about one-third of patients (32.5%, n = 65) had gastrointestinal cancer. More details

on demographic and contextual variables are provided in Table 1. Accordingly, the mean age of the patients was 52.35 ± 6.30 years.

Table 1. Demographic Characteristics of Participants

Demographic Status	No. (%)
Age	
40 - 50	35 (17.5)
51 - 60	100 (50)
> 60	65 (32.5)
Gender	
Male	109 (54.5)
Female	91 (45.5)
Education	
Academic	124 (62)
Non academic	76 (38)
Residency	
Rural	54 (27)
Town	35 (17.5)
City	111 (55.5)
Involved organ	
GI	65 (32.5)
Blood	40 (20)
Lung	37 (18.5)
Breast	32 (16)
Skin	11 (5.5)
Other	15 (7.5)
Ward	
Oncology	70 (35)
Torax	60 (30)
General	40 (20)
Emergency	30 (15)

The mean and standard deviation of the model constructs are reported in Table 2. The highest score was for defensive motivation (10.21 ± 1.90), and the lowest score belonged to defensive motivation (6.33 ± 2.42). Table 2 also shows the correlations between the constructs of EPPM. Intention positively most correlated with self-efficacy (r = 0.390, P < 0.001), followed by susceptibility (r = 0.248, P < 0.001), severity (r = 0.186, P < 0.001), and response efficacy (r = 0.166, P < 0.05). Some of the relationships between other constructs of EPPM were also negatively or positively significant as demonstrated in Table 2.

In the regression model, none of the demographic and contextual variables had a significant role in predicting self-efficacy. As shown in Table 3, among the constructs of EPPM, perceived susceptibility (coefficient = 0.23, P-value < 0.001) and perceived severity (coefficient = 0.160, P-value = 0.026) were significant predictors of self-efficacy, while response efficacy intention fear and defensive motivation were not significant. In the regression model, R squared (R^2) and adjusted R squared (adj-R^2) were 0.182 and 0.180, respectively. Therefore, it can be inferred that approximately 18% of the changes in self-efficacy can be explained by perceived susceptibility and perceived severity.

5. Discussion

The immune system alters in cancer patients. Changes in the immune system that regulate the body's protective mechanisms can increase the risk of viral infection. The risk of infection can be increased by cancer itself, chemotherapy, unhealthy diet, and conditions that are not associated with cancer, such as chronic diseases and aging [16]. Considering that studies have shown that patients with a defect in the immune system are at higher risk of COVID-19 [17, 18], this study was conducted to investigate the risk perception of these patients based on the EPPM.

When the cancer patients of Imam Khomeini Hospital in Ardabil were investigated in terms of the risk perception of COVID-19, it was observed that they had a suitable perceived susceptibility and perceived severity towards COVID-19. Moreover, we measured the predictors of self-efficacy in health measures to prevent and deal with COVID-19, and the results showed that these two variables predicted 18% of the variance in self-efficacy. In line with this study, the results of a study among people referring to clinics in Sari city, northern Iran, also showed that there was a significant correlation between self-efficacy and perceived severity, as well as self-efficacy and perceived susceptibility related to COVID-19. Also, perceived susceptibility and severity predicted 10% of the variance in self-efficacy [19].

The results of other studies also contain inconsistencies that can help provide a comprehensive insight into the relationship between the investigated variables. The results of a study in the general population of South Korea based on EPPM showed that perceived susceptibility had no significant relationship with self-efficacy, but perceived severity had a weak but significant relationship with self-efficacy; also, neither had a significant role in predicting COVID-19 control responses [20]. In line with Fang et al.'s study, the results of a study on flight attendants in Taiwan demonstrated that perceived susceptibility, unlike perceived severity, had no significant correlation with self-efficacy and

Table 2. Correlation Between the Construct of the Extended Parallel Process Model

Structures	Mean ± SD	1	2	3	4	5	6	7
1. Self-efficacy	10.21 ± 1.90	1	0.248 [a]	0.186 [a]	0.390 [a]	0.166 [b]	-0.082	-0.019
2. Susceptibility	9.52 ± 1.85	-	1	0.115	0.098	0.065	0.138	-0.140 [b]
3. Severity	7.83 ± 2.11	-	-	1	0.066	0.072	0.171 [b]	-0.112
4. Intention	9.17 ± 2.13	-	-	-	1	0.123	-0.086	-0.029
5. Response efficacy	8.29 ± 1.72	-	-	-	-	1	0.066	-0.098
6. Fear	6.36 ± 2.15	-	-	-	-	-	1	0.183 [b]
7. Defensive motivation	6.33 ± 2.42	-	-	-	-	-	-	1

[a] Significant at < 0.05.
[b] Significant at < 0.001.

Table 3. Multiple Linear Regression Demonstrating Predictors of Self-efficacy

Independent Variable	Co-eff (β)	Std. Err.	P-Value
Susceptibility	0.230	0.075	< 0.001
Severity	0.160	0.080	0.026
Intention	0.872	0.270	0.062
Response efficacy	0.932	0.212	0.053
Fear	-0.030	0.352	0.650
Defensive motivation	-0.012	0.339	0.613
Prob > F		0.001	
R-squared		0.182	
Adj R-squared		0.180	

also had no significant role in predicting preventive behaviors against COVID-19 (21). The results of an online survey in Sri Lanka based on the health belief model demonstrated that the cues to action taken to prevent COVID-19 were not significantly influenced by perceived susceptibility and perceived severity (22). Surprisingly, the results of a study on Turkish adults showed that the perceived severity had a significant negative relationship with the self-efficacy of the participants, and higher self-efficacy and lower perceived intensity led to better mental health during the coronavirus outbreak (23). It should be noted that the mentioned studies were conducted in the general population with different problems and challenges from the patients in our study. Therefore, it can be expected that the role of perceived susceptibility and severity in cancer patients is more significant in the regression equation. In line with this justification, an international study demonstrated that the perceived susceptibility and perceived severity of cancer patients compared to the general population regarding the risks of COVID-19 was significantly higher (24). In the aforementioned study, affected by higher

susceptibility and severity, cancer participants reported higher self-efficacy for following nationally recommended guidelines on protective behaviors for COVID-19 compared to non-cancer participants (24).

One of the interesting results of the present study was the absence of a significant correlation between the two main components of the risk perception of COVID-19, including perceived susceptibility and perceived severity. The results of an American study also demonstrated that perceived severity predicted a greater proportion of the variance in prevention practices than in susceptibility to contracting COVID-19, but a moderation analysis showed no interaction between perceived susceptibility and severity, providing evidence that these variables do not affect each other (25). This topic can be explored further in future studies.

People take necessary actions to engage in preventive behaviors if they perceive the risk and severity of diseases (26). At the beginning of the outbreak, COVID-19 was a cause of stress and anxiety per se due to the high hospitalization and death rate and technical complications (27). It should also be added that although sometimes the perception of susceptibility and severity of a disease may be associated with some stress, the perception of risk is not synonymous with endangering mental health since studies found that higher risk perceptions were associated with more protective behaviors to cope (28). Perceived susceptibility refers to the likelihood of being affected by a threat, and perceived severity refers to the degree to which a person believes a threat is serious (29). Therefore, it can be concluded that these two structures, with both a knowledge component and a psychological component, have the ability to promote self-efficacy and inappropriate psychological conditions (30).

This research was limited by the reliance on self-report data. Participants in this research may have over-reported

or under-reported their risk perception. Also, the health risks of COVID-19 and the health limitations of cancer patients complicated the questioning process. However, we tried to provide a safe and comfortable environment for patients to complete the questionnaire. Despite these limitations, the present study provided valuable points regarding the relationship between risk perception and its constructs, including perceived sensitivity and perceived severity, with self-efficacy in cancer patients in the context of COVID-19.

5.1. Conclusions

This study indicated that perceived susceptibility, perceived severity, response efficacy, and intention were significantly correlated with self-efficacy in the context of COVID-19. Also, perceived susceptibility and severity had significant roles in predicting self-efficacy. Considering the recent pandemic, it is proposed that based on the conditions of cancer patients, health providers in oncology wards provide the necessary information to enhance the risk perception regarding COVID-19 and promote self-efficacy in observing health protocols.

Footnotes

Authors' Contribution: Study concept and design: Sajjad Narimani and Somaieh Matin; acquisition of data: Vahideh Hosseini and Parisa Motamedi; analysis and interpretation of data: Sajjad Narimani and Elham Zarehoseinzade; drafting of the manuscript: Sajjad Narimani; critical revision of the manuscript for important intellectual content: All authors; administrative, technical, and material support: Sajjad Narimani; study supervision: Somaieh Matin and Sajjad Narimani.

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Informed Consent: Before collecting the data, the objectives of the study were explained to the patients, and a written informed consent form was obtained.

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