






The Open Public Health Journal

Content list available at: <https://openpublichealthjournal.com>



RESEARCH ARTICLE

Investigating the Relationship between Needs and Life Expectancy (Maslow's Hierarchy) among COVID-19-Recovered Patients

Kiavash Hushmandi¹ , Sam Saghari²  and Rasoul Raesi^{3,*} 

¹Department of Food Hygiene and Quality Control, Division of Epidemiology and Zoonoses, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran

²Department of Health Services Management, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran

³Department of Health Services Management, Mashhad University of Medical Sciences, Mashhad, Iran

Abstract:

Aim:

The purpose of this study was to examine the association between Maslow's hierarchy of human needs and life expectancy in COVID-19-recovered patients.

Background:

The widespread prevalence of COVID-19 has had an impact on life expectancy. Moreover, life expectancy is affected by individuals' roles and positions in society. The purpose of this study was to examine the association between Maslow's hierarchy of human needs and life expectancy in COVID-19-recovered patients.

Methods:

A correlational cross-sectional study was conducted over a period of three months. One hundred individuals who recovered from COVID-19 were enrolled through the convenience sampling method. The data collection instrument was a three-part electronic questionnaire comprising a demographics form, a researcher-developed needs assessment tool based on Maslow's hierarchy of needs, and Snyder *et al.*'s Hope Scale. The collected data were analyzed using the Pearson correlation coefficient and multiple regressions in the SPSS-15 statistical software. The level of significance was set at $P < 0.05$.

Results:

Life expectancy was significantly and positively linked with Maslow's hierarchy of needs in general ($r = 0.53$), as well as with the levels of basic needs ($r = 0.53$), security needs ($r = 0.51$), social needs ($r = 0.48$), esteem needs ($r = 0.46$), and self-actualization needs ($r = 0.42$) ($P < 0.001$).

Conclusion:

The fulfillment of basic needs is of paramount importance for COVID-19-recovered patients and can lead to increased life expectancy in these people.

Keywords: Maslow's hierarchy, Need, Life expectancy, Patient, Life, COVID-19.

Article History

Received: February 24, 2023

Revised: July 01, 2023

Accepted: July 05, 2023

1. INTRODUCTION

Human life is fraught with countless incidents and events. Some happenings, such as sickness, can carry anxieties that might be the source of psychological repercussions. One such phenomenon that has affected the daily life of all human beings

is COVID-19. The disease spread quickly all across the globe and caused worldwide panic because of its unknown and lethal nature. In Iran, as in other countries, the spread of this virus has caused complicated and diverse consequences in several fields: economic, cultural, social, and psychological [1 - 3]. People's mental health is indeed jeopardized by a variety of factors, including the risk of illness, the fear of death, the spread of false information and gossip, the disruption of daily routines,

* Address correspondence to this author at the Department of Health Services Management, Mashhad University of Medical Sciences, Mashhad, Iran; E-mail: raesi.br881@gmail.com

travel restrictions or lockdowns, decreased social contact with family members, coworkers, and friends, and occupational and financial problems, to name just a few [4, 5]. Together, they can induce a wide range of symptoms, ranging from anxiety and fear to morbid stress and obsessive-compulsive disorder linked with disease [6], signs of post-traumatic stress disorder [7], increased loneliness, a decline in social support, and a lower life expectancy [8].

As mentioned, one of the psychological consequences of implementing such health policies in the community can be increased anxiety and stress, resulting in a reduction in life expectancy [9]. Marois *et al.* have demonstrated in their study of the potential effects of COVID-19 on life expectancy that the prevalence of the virus is negatively linked with life expectancy and that life expectancy declines as the disease prevails [10].

Life expectancy is a health indicator. It is, according to Snyder *et al.*, a forward-looking cognitive construct. The desire for a better life results in the individual's facilitated adaptation and adjustment. Hopeful people are more motivated to participate actively in problem-solving processes, adaptability, and flexibility because they have more potent stimuli and energy to pursue their goals [11, 12].

Life expectancy is characterized by goal-orientedness, the capacity to plan, the desire to attain goals, awareness of challenges, and the ability to overcome barriers and enhance performance [13, 14]. With higher hope, one can grasp goals better, have a stronger sense of confidence, and manage stress more effectively. Under such circumstances, individuals are well aware that they must have a precise strategy in place to deal with any type of stress. Without hope, life comes to a halt, leading to worry and anxiety. Disappointment places individuals in a position where they are unable to weigh and decide effectively. Despair renders individuals vulnerable and helpless in the face of pressure. Thus, life expectancy is seen as a critical indication of human survival and health [15, 16].

Studies indicate that life expectancy is linked with the role and position of the individual in society. Hence, people with different roles, needs, and positions will have different levels of life expectancy. One theory that classifies human needs is Abraham Maslow's theory of human motivation [13, 17].

Maslow's hierarchy of human needs is depicted as a five-level pyramid. This hierarchy starts with the basic needs at the bottom and progresses to more complex human needs at the top. The levels include physiological or physical needs, security needs, social needs or belonging and love needs, esteem needs, and self-actualization needs.

According to Maslow's theory, lower-level needs are more potent, and a person can only progress to higher-level needs after their basic needs are satisfied. In this theory, human needs are divided into five categories, as described below:

1. Biological needs: Biological needs are the first building blocks of the hierarchy and have the most substantial impact on one's behavior until they are satisfied to a certain degree. Biological needs are human survival, such as food, clothing, shelter, and reproduction. As long as the basic needs are not sufficiently satisfied, the majority of a person's activities are

likely to remain at this level, and higher-level needs will be motivated to a significantly lesser degree.

2. Security needs: These include well-being, health security, financial security, and protection from panic and violence. In other words, it includes the need to protect oneself at present and in the future.

3. Social needs or belonging and love needs: Humankind is a social being, and when social needs peak, one strives for meaningful relationships with others.

4. Esteem needs: This set of needs begins with self-respect and progresses to esteem earned *via* respect and acknowledgment from others. If people are unable to meet their desire for respect through constructive behavior, they may resort to destructive or reckless behavior to satisfy the need for attention.

5. Self-actualization and self-motivation need: They describe the flourishing and fulfillment of all latent talents of oneself, whatever these talents may be. As Maslow puts it: "What a man can be, he must be".

According to Maslow, human needs are hierarchical, with the most acute needs driving one's behavior at any given moment. When needs begin to be satisfied, a change occurs in one's motivation. Indeed, a new level of needs replaces the fulfilled level, foregrounds, and motivates behavior. Newer needs peak likewise until they are fulfilled; subsequently, they recede to be replaced by a different set [18 - 20].

Understanding the life expectancy of COVID-19-recovered patients and recognizing their needs as per Maslow's pyramid can, as fundamental research, demonstrate the efficiency of the Ministry of Health's policies in fighting COVID-19 and supporting patients with the disease. No inquiry has yet been undertaken to determine the position of the needs of COVID-19 patients on Maslow's pyramid and its relationship with life expectancy in these patients. Indeed, the existence of a link between these two variables, *i.e.*, needs level and life expectancy, or the life expectancy status of COVID-19 patients, is unknown. Thus, the main objective of this study was to ascertain the link between Maslow's hierarchy of needs and life expectancy among COVID-19-recovered patients in Khaf.

2. MATERIALS AND METHODS

This research is a descriptive-analytical, cross-sectional study intending to determine the associations between Maslow's hierarchy of needs levels and life expectancy in COVID-19-recovered patients residing in Khaf in the second quarter of 2021. All people aged 18 to 65 who had been diagnosed with COVID-19 illness and had recovered their health were included in the statistical population. The lack of symptoms and persistent sequelae were considered improvement criteria. To be included, the participants were required to be between the ages of 18 and 65, have a history of COVID-19 with a positive PCR test, be literate and alert, have access to a smartphone and the Internet to receive the electronic questionnaire link and provide their consent to participate. Incomplete questionnaire submissions and a refusal to continue participating in the study were exclusion criteria.

As the number of individuals who recovered from the COVID-19 disease from the beginning of April 2021 to the end of June 2021 was $n = 134$, the sample size was estimated to be $n = 100$, considering Cochran's formula and a 5% error level. The patients included those referring to the comprehensive health service centers of Khaf City in addition to patients discharged from the 22nd-Bahman Hospital of Khaf, which also admits residents of Khaf.

The convenience sampling method was utilized to recruit participants. The ethics committee affiliated with Mashhad University of Medical Sciences issued the code of ethics. Moreover, an introduction letter was obtained from the university's Vice-chancellor for Research and presented to Khaf's health network management and officials. Upon the required arrangements, the demographic characteristics of the recovered patients were collected from the Health Statistics and Information Technology Unit. The respondents were then contacted by phone and requested to complete the study's electronic questionnaire link.

The tool used in this study included a three-part electronic questionnaire. The first part of the questionnaire addressed the demographic characteristics of participants, namely, age, gender, marital status, occupation, monthly income, history of COVID-19 vaccine injection, and time since recovery. The second part was a researcher-developed questionnaire that aimed to determine the needs of individuals according to Maslow's hierarchy of needs. This questionnaire was designed by drawing upon Maslow's needs assessment questionnaire [21], Jones and Pfeiffer's Needs Questionnaire [22], and related literature [18, 23]. With 20 items, the questionnaire was designed to determine participants' needs on Maslow's hierarchy of needs pyramid (namely, basic or physiological needs, security needs, social needs, esteem needs, and self-actualization needs). These items were answered on a seven-point scale, as detailed below:

Strongly agree (+3), Agree (2+), Slightly agree (+1), I have no idea (0), Slightly disagree (-1), Disagree (-2), Strongly disagree (-3).

The components and associated items are:

1. Basic needs: (1-4-16-20).
2. Security needs: (2-3-9-19).
3. Social needs: (5-7-12-15).

4. Esteem needs: (6-8-14-17).

5. Self-actualization needs: (10-11-13-18).

Face validity and expert opinion from six experts were measures taken to warrant the questionnaire's validity and items. All items demonstrated satisfactory content validity. The scores on the CVI scale ranged from 0.79 to 1, indicating that the items were adequate in terms of simplicity, relevance, and clarity. The Cronbach's alpha coefficient of 0.88 was used to establish the instrument's internal consistency.

Part 3, Snyder *et al.*'s Hope Scale (SHS): Developed by Snyder *et al.* in 1991, SHS intends to measure the life expectancy of adults over 15 years of age. It is a self-report scale with 12 items on two subscales of agency and pathways. Four items make up the agency subscale, 4 make up the pathways subscale, and 4 are fillers. Each item is answered on a 4-point Likert scale ranging from *definitely false* (scored 1) to *definitely true* (scored 4). Accordingly, the overall score can range between 12 and 48 [12, 24]. Many studies support the reliability and validity of this scale as a measure of hope. The internal consistency of the whole test ranges between 0.74 to 0.84, and the test-retest reliability coefficient is reported to be 0.80. The coefficient has been significantly greater in periods longer than 8 to 10 weeks. Internal consistency of the agency subscale ranges between 0.71 and 0.76, while that of the pathways subscale is from 0.63 to 0.80 [25]. In Iran, Kermani *et al.* have reported the instrument's reliability using Cronbach's alpha and test-retest methods as 0.86 and 0.81, respectively [26]. Data were analyzed using SPSS-15 statistical software. First, the normal distribution of data was evaluated using skewness and elongation coefficients. Given the normal distribution of the data, the Pearson correlation coefficient and multiple regression tests were utilized. The level of significance was set at $P < 0.05$.

3. RESULTS

In this study, 100 COVID-19-recovered individuals were studied, most of whom were female (54%) and married (71%). The highest frequency was related to people over 40 years (47%), high school diploma holders (41%), non-healthcare employees (35%), and those with a monthly income of 5-10 million tomans (44%). Sixty percent had received the COVID-19 vaccine, and nearly half (49%) reported that it had been more than three months since they had recovered (Table 1).

Table 1. Demographic characteristics of the subjects.

	Variable	Frequency	Percent
Gender	Woman	54	54
	Man	46	46
Marital status	Single	29	29
	Married	71	71
Age	≤ 30	18	18
	31-40	35	35
	> 40	47	47

(Table 1) contd.....

	Variable	Frequency	Percent
Education	Secondary or lower	20	20
	High school	41	41
	Tertiary	39	39
Occupation	Healthcare staff	19	19
	Non-healthcare employee	35	35
	Self-employed	16	16
	Homemaker or unemployed	20	20
	Retiree	10	10
Monthly income	< 5.000.000 tomans	42	42
	5–10 million tomans	44	44
	> 10 million tomans	14	14
Vaccinated against COVID-19	No	40	40
	Yes	60	60
Time elapsed since recovery	≤ 1 month	19	19
	1-3 months	32	32
	> 3 months	49	49

Table 2. Descriptive indicators of research variables.

Variable	Mean	Standard Deviation (SD)	Skewness	Elongation	Mean ± SD
Basic needs	5.50	4.80	-1.11	0.73	5.50 ± 4.80
Security needs	4.17	4.70	-0.99	0.42	4.17± 4.70
Social needs	3.34	4.87	-1.01	0.24	3.34± 4.87
Esteem needs	2.66	5.33	-0.81	-0.11	2.66± 5.33
Self-actualisation needs	1.85	5.65	-0.65	-0.22	1.85 ± 5.65
Overall needs	5.50	4.80	-1.11	0.73	5.50± 4.80
Life expectancy	26.21	5.57	-0.05	-1.19	26.21± 5.57

Table 3. Regression coefficients related to the effects of Maslow's hierarchy of needs and demographic variables on life expectancy.

Variable	Non-standard Coefficient		Standard Coefficient	T-value	Significance Level	Correlation Coefficient	Coefficient of Determination	
	β-value	Standard Error	β-value					
Fixed	32.21	2.85	-	11.29	< 0.001	-	-	
Age	-0.12	0.06	-0.017	2.07	0.04	0.44	0.18	
Gender	-1.95	0.82	-0.18	2.37	0.02	0.50	0.23	
Education level	Diploma	0.27	1.03	0.02	0.26	0.80	0.57	0.30
	Tertiary	-2.01	1.28	-0.18	1.56	0.12		
Occupation	Non-healthcare employee	2.37	1.07	0.20	2.21	0.03	0.83	0.66
	Self-employed	-0.83	1.42	-0.06	0.58	0.56		
	Homemaker/unemployed	-6.25	1.93	-0.45	3.24	0.002		
	Retiree	-5.21	1.88	-0.28	2.78	0.007		
Monthly income	5-10 million tomans	-1.21	1.33	-0.11	0.91	0.36	0.84	0.67
	> 10 millions	1.88	1.49	0.12	1.27	0.21		
COVID-19 vaccine injected	1.76	1.34	0.16	1.32	0.19	0.85	0.68	
Time since recovery	1-3 months	-0.70	1.09	-0.06	0.64	0.53	0.85	0.67
	> 3 months	-0.34	1.11	-0.03	0.30	0.76		

(Table 3) contd....

Variable	Non-standard Coefficient		Standard Coefficient	T-value	Significance Level	Correlation Coefficient	Coefficient of Determination
	β-value	Standard Error	β-value				
Basic needs	0.08	0.20	0.07	0.38	0.71	0.85	0.66
Security needs	0.10	0.33	0.09	0.30	0.76		
Social needs	0.09	0.34	0.07	0.25	0.80		
Esteem needs	-0.16	0.38	-0.15	0.41	0.68		
Self-actualization needs	0.03	0.29	0.03	0.10	0.92		

Based on the results, the highest mean score from respondents concerned the basic needs level (5.50 ± 4.80), while the lowest average was related to self-actualization needs (1.85 ± 5.65). The overall score for Maslow’s needs amounted to 5.50 ± 4.80 , and the mean life expectancy score was 26.21 ± 5.57 . Given that the coefficients of skewness and elongation for all research variables were in the range [2], the research data exhibited a normal distribution (Table 2).

According to the Pearson correlation coefficient, life expectancy in the subjects has a significant positive relationship with Maslow’s hierarchy of needs in general ($r = 0.53$) and the levels of basic needs ($r = 0.53$), security needs ($r = 0.51$), social needs ($r = 0.48$), esteem needs ($r = 0.46$), and self-actualization needs ($r = 0.42$) ($P < 0.001$). Multiple linear regression was used to examine the effects of Maslow’s hierarchical levels of needs and demographic variables on life expectancy. Moreover, during coding was employed to integrate qualitative variables (gender, marital status, occupation, education level, monthly income level, COVID-19 vaccination, and recovery time) into the model. In addition, the levels of Maslow’s hierarchy of needs and age were quantitatively incorporated into this model.

The test results showed that life expectancy holds a significantly negative relationship with age ($P = 0.04$) and gender ($P = 0.02$). Indeed, life expectancy decreased significantly with age and was significantly higher in women than men. The results also revealed that life expectancy was significantly higher in non-healthcare employees and significantly lower in homemakers, unemployed people, and retirees. However, life expectancy did not exhibit a significant correlation with education level, monthly income level, COVID-19 vaccination, recovery time, and the levels of Maslow’s hierarchy of needs ($P > 0.05$) (Table 3).

4. DISCUSSION

This study explored the association between the levels of Maslow’s needs hierarchy and life expectancy in persons who recovered from COVID-19. Findings revealed that the maximum mean score of Maslow’s hierarchy of needs was associated with basic needs and the lowest mean was linked to self-actualization needs. Given the absence of a similar study, it is not feasible to compare results.

Regarding this first finding of the research, it should be postulated that COVID-19 has overshadowed all human needs at all levels, affecting social relations and activities that are the ground for the emergence and satisfaction of human needs at different levels. Fulfilling human physiological (basic) needs in the present day is meaningless without participation in society

and is entirely dependent on social activities. With its widespread prevalence and forced home quarantines, COVID-19 has indeed curtailed social activities, whereby vast numbers of individuals have lost their occupations, resulting in serious financial troubles for families and disruption of basic needs.

To continue treatment at home, moreover, some patients have had to provide medications and respiratory support devices at a substantially higher cost incurred by increased sanctions and inflation. These constraints have disrupted the families’ budget and made it exceedingly difficult to satisfy their basic needs. The fact that the highest mean score of Maslow’s hierarchy of needs in patients recovered from COVID-19 concerns the level of basic needs implies that these individuals require special attention and comprehensive support to meet the basic needs of themselves and their families.

According to Maslow, human needs follow a hierarchy wherein the most extreme needs shape the behavior of individuals at specific moments. When a person’s basic requirements are met, another set of needs emerges and drives behavior and motivation. Varying needs peak and subside successively until the end of the hierarchy of needs [18 - 20]. This justifies the first finding of our study regarding the fact that self-actualization needs to gain the lowest mean score on Maslow’s hierarchy of needs in COVID-19-recovered patients. In explaining this finding, it can be pointed out that one’s levels of needs, according to Maslow’s pyramid, are shaped by the most severe needs. When one is involved in basic needs, there would not be the opportunity to move to higher levels of Maslow’s pyramid. Therefore, engagement at the basic needs level is one of the reasons why the lowest mean score concerned the level of self-actualization needs in COVID-19-recovered patients.

Additionally, the current study demonstrates a significant positive link between life expectancy and Maslow’s hierarchy of needs in general and all levels in COVID-19-recovered patients. Life expectancy correlated with the needs levels at varying degrees, and the intensity lowered in the following order: basic needs, security needs, social needs, esteem needs, and self-actualization needs. The current study’s findings indicate that the levels of Maslow’s pyramid have a significant, direct association with the participants’ life expectancy.

Consistent with our findings, Marois *et al.* demonstrated that the psychological consequences of community health policy implementation might include increased anxiety and stress and decreased life expectancy in the general population, particularly in patients with COVID-19. Additionally, they

found that COVID-19 prevalence is inversely connected to life expectancy and that life expectancy declines as COVID-19 prevalence increases [10]. The findings of Doggleby, *et al.*'s study, also agree with ours. Their study established a relationship between life expectancy and one's function and position in society, demonstrating that individuals with varying responsibilities, needs, and positions had varying degrees of life expectancy [13].

In this regard, one may argue that the country's COVID-19 circumstances raised the cost of households impacted by this disease and amplified the unemployment problem during the COVID-19 period. Indeed, many families whose caregivers did not have full-time jobs or worked part-time prior to the outbreak of COVID-19 were compelled to stay at home and were harmed by the socioeconomic difficulties caused by the epidemic. One of COVID-19's socioeconomic consequences is a rise in community poverty, which threatens individual health [27 - 29].

In the COVID-19 epidemic, the inability of low-income families with basic needs to pay for treatment is a typical phenomenon. When COVID-19 therapy is prohibitively expensive, this group's vulnerability to COVID-19 grows due to the lack of comprehensive health insurance coverage in low-income groups, as a result, we will see more problems for families with basic needs. [29, 30]. Based on current research findings, it has been determined that there is a strong correlation between life expectancy and factors related to basic needs (according to Maslow's hierarchy of needs). Therefore, it can be said that people's financial problems during the covid-19 pandemic have led to people being at the level of basic needs and have affected their life expectancy.

CONCLUSION AND RECOMMENDATIONS

Currently, meeting all five levels of Maslow's pyramid of human needs necessitates one's presence in society and is contingent on one's activities, relationships, and social interactions. The COVID-19 pandemic has wrought significant changes in human life, including increased adherence to health standards such as obligatory house isolation and social distancing. However, the coronavirus has entirely eclipsed and impacted all human needs at all levels. It has completely overshadowed the community, social interactions, and social activities that serve as the locus of emergence and fulfillment of basic (physiological) needs. On the other hand, the life of contemporary humankind is inconceivable without her/his presence in society.

Families' involvement in the COVID-19 crisis at the level of basic needs has resulted in a decline in life expectancy to the point that basic needs provision has become the primary demand of those recuperating from COVID-19. As a result, health policymakers, managers, and other relevant officials are urged to prioritize fulfilling the fundamental needs of COVID-19 patients and their families in order to enhance their life expectancy.

LIMITATIONS OF THE STUDY

This study has limitations, including:

1- Given a dearth of relevant works and studies, the

findings could not be easily compared with those of related research reports.

2- A electronic questionnaire was used to collect data for this study; as a result, some participants may have refused to provide reliable information.

3- Cross-sectional study, short study period, and small sample size. Therefore, it is suggested that future studies be conducted with other sampling methods, with a longer period of time and with a larger sample size.

4- The present study's findings are applicable to all COVID-19-recovered patients at the 22nd Bahman Hospital in Khaf city. Therefore, there are limitations to the generalizability of the current study's findings.

5- The potential psychological problems of respondents and their individual and personality characteristics at the time of data collection, which may have impacted the survey results. Notably, perfect management of this limitation was beyond the researcher's control.

6- A portion of the sample group lacked access to cell phones. The researcher completed the electronic questionnaire by calling respondents to circumvent this constraint.

7- Since this study was conducted with literate COVID-19-recovered patients, it cannot be generalized to the entire population.

AUTHORS' CONTRIBUTION

The authors contributed equally to the conceptualization and design of the study, the data analysis, and the write-up of the paper.

ETHICAL STATEMENT

In terms of ethical considerations, the present study was ethical in two respects: first, all the participants volunteered to participate in the study, and secondly, Keeping in mind the principles of confidentiality and secrecy, participants were assured that all information would remain confidential and that the results would be reported in a general manner. All procedures performed in the study involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1975 Helsinki Declaration and its later amendments or comparable ethical standards. This article reports the results of a research project approved by Mashhad University of Medical Sciences with the code of ethics (IR.MUMS.REC.1400.099).

CONSENT FOR PUBLICATION

In order to comply with ethical considerations in this research, the information of the participants was kept confidential and other people were not able to access this information. The names and surnames of the participants were not used for data collection, and data collection was done after obtaining the code of ethics from Mashhad University of Medical Sciences.

AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this study are available from the corresponding author [R.R.] upon reasonable request.

STANDARDS OF REPORTING

COREQ guideline has been followed.

FUNDING

This study was funded by Mashhad University (grant no. 4000113).

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

We are grateful to the Vice-Chancellor for Research and Technology of Mashhad University of Medical Sciences, who funded this research effort, as well as the respected officials of the 22 Bahman Khaf Hospital, participants, and all those who assisted us with this study.

REFERENCES

- [1] Saadattalab A, Jafari M. Mediator role of spiritual happiness in the relationship between social capital and social support with resiliency in employees against COVID-19 diseases epidemic in the period of social distance. *Journal of Research in Psychological Health* 2020; 14(1): 115-29. [https://rph.khu.ac.ir/article-1-3761-fa.pdf].
- [2] Buzolits JS, Abbey A, Kittredge K, Smith AE. Managing trauma exposure and developing resilience in the midst of COVID-19. *Routledge* 2020; pp. 209-20. [http://dx.doi.org/10.4324/9781003142089-20]
- [3] Seedhouse D. The case for democracy in the COVID-19 pandemic / David Seedhouse. Thousand Oaks : SAGE 2020.
- [4] Saffarinia M. The prediction of mental health based on the anxiety and the social cohesion that caused by Coronavirus. *Quarterly Social Psychology Research* 2020; 9(36): 129-41. [https://www.socialpsychology.ir/article_105547_17142ef5624bd60d8c5c909969e1a933.pdf?lang=en].
- [5] Vismara L, Lucarelli L, Sechi C. Attachment style and mental health during the later stages of COVID-19 pandemic: the mediation role of loneliness and COVID-19 anxiety. *BMC Psychol* 2022; 10(1): 62. [http://dx.doi.org/10.1186/s40359-022-00767-y] [PMID: 35287741]
- [6] Brooks SK, Smith LE, Webster RK, et al. The impact of unplanned school closure on children's social contact: rapid evidence review. *Euro Surveill* 2020; 25(13): 2000188. [http://dx.doi.org/10.2807/1560-7917.ES.2020.25.13.2000188] [PMID: 32265006]
- [7] Shultz JM, Baingana F, Neria Y. The 2014 Ebola outbreak and mental health: current status and recommended response. *JAMA* 2015; 313(6): 567-8. [http://dx.doi.org/10.1001/jama.2014.17934] [PMID: 25532102]
- [8] Shigemura J, Ursano RJ, Morganstein JC, Kurosawa M, Benedek DM. Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: Mental health consequences and target populations. *Psychiatry Clin Neurosci* 2020; 74(4): 281-2. [http://dx.doi.org/10.1111/pcn.12988] [PMID: 32034840]
- [9] Fegert JM, Vitiello B, Plener PL, Clemens V. Challenges and burden of the Coronavirus 2019 (COVID-19) pandemic for child and adolescent mental health: a narrative review to highlight clinical and research needs in the acute phase and the long return to normality. *Child Adolesc Psychiatry Ment Health* 2020; 14(1): 20. [http://dx.doi.org/10.1186/s13034-020-00329-3] [PMID: 32419840]
- [10] Marois G, Muttarak R, Scherbov S. Assessing the potential impact of COVID-19 on life expectancy. *PLoS One* 2020; 15(9): e0238678. [http://dx.doi.org/10.1371/journal.pone.0238678] [PMID: 32941467]
- [11] Rassouli M, Yaghmaie F, Majd HA. Psychometric properties of "Hopefulness Scale for Adolescents" in Iranian institutionalized adolescents. *Payesh* 2010; 9(2): 197-204. [Health Monitor].
- [12] Moharer SG, Shirazi M, Kia S, Karami Mohajeri Z. The effect of compassion focused training on hope, life satisfaction and alexithymia of delinquent female adolescents. *Iranian J Psych Nurs* 2020; 8(3): 46-56. [http://ijpn.ir/article-1-1572-en.html].
- [13] Duggleby W, Cooper D, Penz K. Hope, self-efficacy, spiritual well-being and job satisfaction. *J Adv Nurs* 2009; 65(11): 2376-85. [http://dx.doi.org/10.1111/j.1365-2648.2009.05094.x] [PMID: 19737323]
- [14] Roser M, Ortiz-Ospina E, Ritchie H. Life Expectancy - Our World in Data. 2013.
- [15] Angelakis A, Vuorinen H, Nikolaidis C, et al. Water quality and life expectancy: Parallel courses in time. *Water* 2021; 13(6): 752. [http://dx.doi.org/10.3390/w13060752]
- [16] Aburto JM, Schöley J, Kashnitsky I, et al. Quantifying impacts of the COVID-19 pandemic through life-expectancy losses: a population-level study of 29 countries. *Int J Epidemiol* 2022; 51(1): 63-74. [http://dx.doi.org/10.1093/ije/dyab207] [PMID: 34564730]
- [17] Navy SL. Theory of Human Motivation—Abraham Maslow. In: *Science Education in Theory and Practice, An Introductory Guide to Learning Theory*. 2020; pp. 17-28. [http://dx.doi.org/10.1007/978-3-030-43620-9_2]
- [18] Keshtkaran A, Kharazmi A, Yoosefi S. A study on incentive needs for nursing staffs in selected teaching hospitals of universities of medical sciences according Maslow's needs hierarchy (2007). *J Health Admini* 2006; 9(24): 45-50. [http://jha.iuims.ac.ir/article-1-312-en.html].
- [19] Arshi S, Sadeghi H, Seifnejad S, Salemsafi P, Biriya M. A study of maslow hierarchical needs among staff of ardabil university of medical sciences and their satisfaction, 2002. *J Ardabil Uni Med Sci* 2005; 5(2): 160-6. [http://jarums.arums.ac.ir/article-1-603-en.html].
- [20] Mirzamohammadi M, Zahedi Z. Meeting maslow's need hierarchy and job satisfaction of educational managers. *Teaching and Learning Research* 2007; 4(2): 25-31. [https://tlr.shahed.ac.ir/article_2119_37730cb75e163171c7bdddcb2d5d618a0.pdf?lang=en].
- [21] Brown K, Cullen C. Maslow's hierarchy of needs used to measure motivation for religious behaviour. *Ment Health Relig Cult* 2006; 9(1): 99-108. [http://dx.doi.org/10.1080/13694670500071695]
- [22] Pfeiffer JW, Jones JE. The annual handbook for group facilitators. *University Associates Publishers* 1973.
- [23] Hopper E. Maslow's hierarchy of needs explained. *ThoughtCo. ThoughtCo* 2020; 24: 1-3. [http://www.christianworldmedia.com/client/docs/603_1585079540_17.pdf].
- [24] Snyder CR, Harris C, Anderson JR, et al. The will and the ways: Development and validation of an individual-differences measure of hope. *J Pers Soc Psychol* 1991; 60(4): 570-85. [http://dx.doi.org/10.1037/0022-3514.60.4.570] [PMID: 2037968]
- [25] Sadeghi Z, Hamzehpoor T. The Relationship Between Life Expectancy And Death Anxiety And Mental Health Of Devotees Spouses City Branch. 2016. Available from: https://www.sid.ir/paper/828129/fa#downloadbottom
- [26] Kermani Z, Khodapanahi M, Heidari M. Psychometrics features of the Snyder Hope Scale. 2011. Available from: https://apsy.sbu.ac.ir/article_95512_284950ca5053fefe222b4d58230be56b.pdf
- [27] Ray D, Subramanian S. India's lockdown: An interim report The Impact of COVID-19 on India and the Global Order: A Multidisciplinary Approach. *Springer* 2022; pp. 11-61.
- [28] Grima S, Kizilkaya M, Rupeika-Apoga R, Románova I, Dalli Gonzi R, Jakovljevic M. A country pandemic risk exposure measurement model. *Risk Manag Health Policy* 2020; 13: 2067-77. [http://dx.doi.org/10.2147/RMHP.S270553] [PMID: 33116987]
- [29] Asaadi M, Daliri H. Evaluating the effect of poverty and economic inequality on the corona pandemic in iran and the world. *Mudriyyat-i Salamat* 2021; 24(2): 20-32. [http://dx.doi.org/10.52547/jha.24.2.20]. [http://dx.doi.org/10.52547/jha.24.2.20]
- [30] Kola L, Kohrt BA, Hanlon C, et al. COVID-19 mental health impact and responses in low-income and middle-income countries: reimagining global mental health. *Lancet Psychiatry* 2021; 8(6): 535-50. [http://dx.doi.org/10.1016/S2215-0366(21)00025-0] [PMID: 33639109]