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Determining Community Attitudes toward Various Aspects of the COVID-19 Pandemic Using the Social Profile Ratio Technique

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ABSTRACT

Background: Assessing the changes in public attitudes toward pandemics is crucial in adapting public health strategies to changing circumstances. This study aims to assess the community's attitude toward the COVID-19 pandemic using the Social Profile Ratio (SPR) method among different occupational groups in Ardabil province.

Methods: Employing a cross-sectional survey design, this research assessed the attitudes of 230 respondents toward the COVID-19 pandemic in June 2020. Then, the standard SPR method, along with the Index of Resolution (IR), was utilized to analyze the SPR scores, considering different aspects (prevention, control, treatment, and impacts) of the pandemic.

Results: According to the SPR values, the occupational groups had different points of view. The highest life expectancy (30 years) was attributed to employees, students, collegians, and instructors. Notably, employees and university professors had the highest SPR and IR values (9.343 and 1) for the prevention indicator. Regarding the control indicator, the unemployed and university professors had SPR and IR values of 5.36 and 0.733, respectively. The highest SPR value of 44.11 in terms of treatment was attributed to employees, while students had the highest SPR value of 10.03 in terms of impact indicator.

Conclusion: The study identified employees, university professors, and the unemployed as the most effective groups across prevention, control, treatment, and impact indicators.

1. Introduction

Throughout history, various pandemics have occurred, including smallpox, tuberculosis, cholera, and AIDS [1]. Among these, the Black Death (also known as the Black Plague) stands out as one of the most devastating, which killed 75 to 200 million people in Eurasia and Africa in the 14th century, making it possibly the deadliest pandemic in human history [2]. Coronavirus belongs to a large family of viruses that can cause respiratory infections ranging from mild colds to severe diseases such as MERS and SARS. The coronavirus emerged as COVID-19 in December 2019 in Wuhan, Hubei Province, China [3-6]. It has been found that the disease spreads among individuals who fail to take it seriously and neglect to follow the guidelines of the World Health Organization and local governments [7]. The outbreak of COVID-19 has affected all sections of society, especially vulnerable social groups, including the poor, elderly, disabled individuals, and those with underlying diseases, who are the target population for coronavirus disease. In addition, employment opportunities have been affected by limited social presence [8]. The social crisis created by the COVID-19 pandemic may also increase global inequality, deprivation, discrimination, and long-term unemployment. The economic consequences have not only had a detrimental impact on public health systems but also on trade, travel,

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food, and agriculture industries, various types of markets, and chain stores, among others [9, 10]. COVID-19 has severely affected all sections of society through increased social distancing and relationship changes. People's social lives have been influenced as many schools, universities, restaurants, and cafes have been forced to close [11]. Many festivals, religious gatherings, and social events have been canceled or postponed. Many countries have declared unprecedented quarantines and states of emergency to combat the pandemic [7, 12]. Proposed solutions to address this pandemic include active management methods and a health policy framework. Effective implementation of these policy solutions requires the full support of all stakeholders, including governments, media, NGOs, health professionals, communities, and individuals [13].

1.1 The Link between Socioeconomic/Demographic Characteristics and the Covid-19 Pandemic

Abdelhafiz *et al.* (2020) conducted a study in Egypt to investigate the knowledge, perceptions, and attitudes of people toward the COVID-19 disease. They found that the average knowledge score among participants was 16.39 out of 23, mainly obtained through social media and the Internet [14]. In the United States, Ettman *et al.* (2020) found that lower income and education levels were associated with higher levels of anxiety and depression in their study of the impact of COVID-19 on mental health [15]. In Italy, Mazza *et al.* (2020) reported that older age was associated with increased levels of anxiety and depression in their study on the impact of COVID-19 on mental health [16].

1.2 Attitudes/views toward the COVID-19 pandemic

González-Sanguino *et al.* (2020) conducted a study in Spain to investigate the impact of COVID-19 on mental health and found that levels of anxiety and depression increased over time, with significant increases occurring during the first wave of the pandemic in Spain [17]. Harper *et al.* (2021) examined changes in health beliefs and behaviors related to COVID-19 among adults in the United States. They noted that attitudes toward mask-wearing and social distancing became more positive over time [18]. The available literature indicates that income, education, and age are significant factors influencing people's attitudes toward the COVID-19 pandemic. Higher income and education levels are associated with more positive attitudes, while older adults tend to have positive attitudes toward preventative actions. Compliance with public health measures has improved over time, but anxiety and depression levels have increased, especially in the early stages of the pandemic. Over time, People's attitudes and views toward the pandemic have changed, with decreased anxiety and perceived threat levels, increased trust in government messaging, and more positive attitudes toward mask-wearing and social distancing. The SPR is a valuable tool used to assess the social aspects of communities in social sciences, health, and environmental issues [19]. The SPR provides a comprehensive perspective on the social environment of a community which allows researchers and policymakers to identify social determinants of health and develop interventions that address the root causes of health disparities [20]. The present study aimed to evaluate people's attitudes toward COVID-19, and compare the SPR and IR index among different business groups.

2. Materials and Methods

2.1 Study design and target population

During the survey in June 2020, the province's condition regarding the COVID-19 disease was in a red and alert status. The present study as a survey research type has been conducted in a cross-sectional manner. Considering the nature and aim of the study, efforts have been made to encompass a broad spectrum of opinions from individuals within the research's target population who, as members of society, can contribute to understanding the factors and effects of the pandemic [21]. In the initial determination of the sample size, the Cochran formula with a confidence level of 95 % was utilized, and subsequently, an appropriate sample size was selected based on the research objectives and constraints [22]. The statistical population in this study comprised 230 individuals who were randomly accessed online to complete the questionnaire [23, 24]. It is noteworthy that due to the unavailability of individuals during the disease outbreak and considering potential non-response, the questionnaire has been completed through an online method [25]. Additionally, regarding the limited number of individuals under the age of 18, the consent of participants for the online questionnaire was included through an optional selection in the online questionnaire. Also, some general/ demographic-related questions were included in the questionnaire to gather information about age, gender, educational status, life expectancy (Likert scale), cardiovascular disease (yes/ no options), and monthly income.

2.2 Measurement tool

The study calculated the SPR and indicators of importance, strength, position, prevention, control, treatment, and effects for interviewees through questionnaire analysis. It should be noted that the questionnaire design was based on the nature of the SPR determination method. In the initial design of the questions, the extent of content validity was confirmed based on the lack of overlap among each section of the SPR method, expert opinions, and the research objectives [26, 27]. Moreover, to determine the reliability of the questionnaire and the alignment of the questions with the real world, a survey repetition was conducted. In this study, the questionnaires were not of the Likert scale type, and the responses were based on scoring in the Salience, Issue Position, and Power sections in the SPR method [28]. Table 1 shows the questionnaire questions related to the SPR and COVID-19 indicators. Importance, power, position, knowledge, attitude, and awareness levels were also examined.

Table 1. Questionnaires for determining the SPR related to prevention, control, treatment, and impacts of COVID-19

Aspect	Indicators	Question
Prevention	Salience	To what extent is prevention and awareness of its transmission effective in preventing disease?
	Issue Position	Do you think that educational programs (mass media and cyberspace) are effective in attracting people's participation and cooperation to observe the principles of personal health?
	Power	Do you agree with changing behaviors and daily habits in preventing disease?
Control	Salience	How effective has the social distancing scheme been in reducing the spread of the virus? Do you comply?
	Issue Position	Want to plan and implement Corona Outbreak Control Plans?
	Power	Do you agree with the implementation of preventive government plans such as quarantine to control the spread of the disease?
Treatment	Salience	How important is it for you to find a vaccine or cure for covid19 disease?
	Issue Position	How effective can the health care staff be in improving patients?
	Power	To what extent can good physical condition and health affect the recovery of people with covid19 disease?
Impacts	Salience	To what extent has the prevalence of covid19 disease affected your income, livelihood, and social behavior?
	Issue Position	How much will change in the pattern of behavior and the absence of crowded places prevent the spread and negative effects of the disease?
	Power	Do you think the coronavirus will last forever and we have to adapt to it?

2.3 Determining of the SPR

The SPR is a tool that helps identify and summarize social issues in a community. The SPR analysis includes a dataset that describes the characteristics of both the community and individuals within the study area, considering economic activists, government and political structures, and public attitudes of the society and people studied. The purpose of calculating the SPR is to collect and summarize social issues to inform decision-making by the planning committee [28]. Developing an SPR consists of steps that are calculated for all participating individuals [19, 29]. These steps are: 1- Defining the subject or the purpose of decision-making, which should be clear and explicit. 2- Introducing people, groups, and organizations involved in decision-making. 3- Reclassification of decision-makers in such a way that participants with the same economic interests are grouped. 4- The structure of decision-making groups should reflect the distribution of power. 5- A score is considered for each participant based on the superiority of the subject, power or influence on the decision, and its importance. 6- Overall weighting is conducted for each participant based on the points of excellence, strength, and importance of the subject. The calculation of the SPR includes the following steps [19, 27, 28]: a- Defining the problem or the purpose of decision-making: The purpose of this research is to evaluate the attitudes of different groups. These groups have effective contributions in decision-making for the implementation of measurements to prevent and control the disease of COVID-19. b- Identifying the factors involved and effective in the decision-making and implementation process: In this regard, participants who have the same economic interests are grouped. Participants with the same decision-making power, especially governmental participants, people whose positions are different from the issue, or people whose decision-making power will be significantly different, are not grouped. c- Calculating the position, power, and importance of the issue for each participant: At this stage, scores are considered for the participants for each of the three indicators of position, strength, and importance. In the estimation of the position, individuals who agree are assigned scores of +3, +2, and +1, whereas neutral opinions are assigned a score of zero. Conversely, opposing opinions are assigned scores of -1, -2, and -3, with larger numbers indicating stronger expressions of opinion. The strength of participants' opinions is captured on a scale ranging from 0 to 3. A score of zero indicates no discernible strength or effect, while a score of 3 reflects a significant impact accompanied by a high level of strength. In terms of perceived importance, as assessed by participants, scores range from 0 to 3. A score of zero signifies a lack of interest or concern for the issue, whereas a score of 3 indicates that participants consider the issue a matter of utmost priority [18]. d- Calculating the weight for each participant and the entire system: The recorded scores of each participant in step 3 (position, power, and importance) with their positive and negative signs are multiplied and the weight is determined. Furthermore, after calculating the weight of each participant, the sum of the positive and negative scores of all participants is calculated separately (SPR = Total negative scores/ Total positive scores).

2.4 Determining the conflict resolution (IR)

The IR is utilized to measure the amount of conflict among decision-makers when there is a need for compromise. The index value ranges from +1 to -1, where values close to +1 indicate a high likelihood of a decision being made. If the value is close to -1, there is a high probability of the decision being excluded from the review. If the value approaches 0, the issue is likely to remain unsolved. In this study, the IR was utilized to analyze the interaction (preventive, control, treatment, and impacts) among opposing and agreeing opinions regarding various aspects of COVID-19. The IR is calculated as (IR = (sps-sns)/ TOTS), where IR is the conflict resolution index ranging from +1 to -1, sps is the sum of the positive scores of each participant, sns is the sum of the negative scores of each participant, and TOTS is the sum of sps and sns [18, 28, 29].

3. Results and Discussion

Table 2 presents key socio-demographic characteristics for the 230 participants in the current study. The participant distribution indicated a predominant representation of females, constituting 59 % of the total sample. Regarding age distribution, individuals between 21 and 30 years accounted for 45 % of the participants, while only a negligible percentage (1 %) fell within the 60-year-old category. In terms of education, the majority of the participants (65 %) possessed university degrees, with 8 % holding doctoral degrees, while 27 % had a high school education or below. Additionally, a notable portion of participants reported a monthly income below 20 million Iranian Rials. It can be stated that individuals within the age range of 21 to 30 and 31 to 40 years had greater internet access and virtual space, alongside naturally lower monthly incomes. Therefore, it can be inferred that this demographic profile represents the social profile of the studied community.

Table 2. Socio-demographic characteristics of the participants (n=230)

Socio-demographic characteristics	Group	Frequency	(%)
Age (years)	14-20	40	17
	21-30	102	45
	31-40	96	30
	41-50	17	7
	51-60	2	1
Marital status	Single	130	56.50
	Married	100	43.50
Gender	Female	135	59
	Man	95	41
Education	Degree	24	10
	Diploma	38	17
	Associate Degree	21	9
	Bachelor	69	30
	master of science	59	26
	Ph.D	19	8
Monthly income (million Iranian Rials)	< 20	128	56
	20-40	58	25
	40-60	29	12
	60-80	9	4
	≥ 80	6	3
Jobs	Employee	51	22
	Collegian	42	18
	Student	33	14
	Ministry of Health Staff	5	2
	Instructor	13	6
	Services	10	4
	Ministry of Science Uni. Prof.	6	3
	Ministry of Health Uni. Prof.	2	1
	Housewife	12	5
	Seller	2	1
	Driver	1	1
	Others	35	15
	Unemployed	17	4

Table 3 shows the life expectancy of the participants since the onset of the COVID-19 disease. Among the participants, 38.5 %, 4.6 %, and 21.8 % reported average, very low, and very high life expectancy, respectively. These participants expressed a desire to enhance their living conditions during the pandemic outbreak.

Table 3. Interviewee's life expectancy from COVID-19 outbreaks in the SPR

Life expectancy	Frequency	(%)
Very little	11	4.6
Low	21	8.8
Medium	92	38.5
High	63	26.4
Very high	52	21.8

Table 4 indicates that 96.2 % of the participants did not have any pre-existing cardiovascular or respiratory disorders, whereas only 3.8 % reported having these conditions.

Table 4. The frequency and percentage of participants with cardiovascular disease in assessing the RSP to the COVID-19 disease

Frequency	Response	(%)
9	Yes	3.8
221	No	96/2

Figure 1 displays the frequency of participation by various occupations in completing the SPR questionnaire. The highest number of participants were employees and college students.

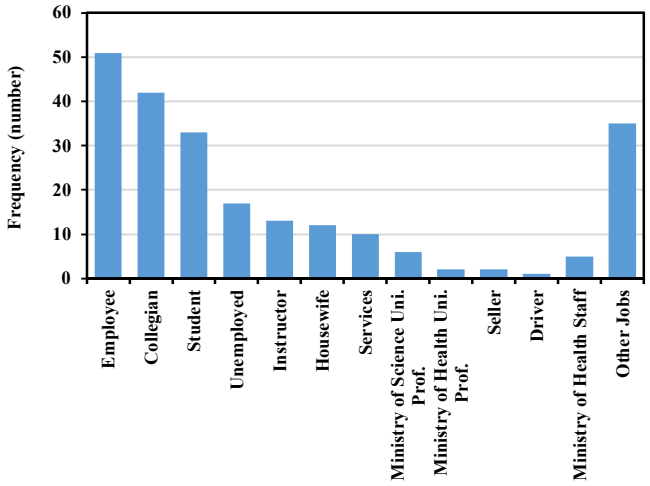

Figure 1. The level of participation of different jobs in determining the RSP to the COVID-19 disease

In Figure 2, the SPR values of prevention indicators are shown for different occupations. Based on the scores assigned to this question and the corresponding graph, it can be inferred that the score for unemployed individuals is higher than that of employees, and students have a higher score than individuals in other occupations. This suggests that implementing preventive measures has had a positive impact on increasing job opportunities and decreasing the spread of disease in public environments such as universities and government offices. Additionally, the high number of unemployed individuals highlights the financial concerns faced by this group and the shortage of job opportunities during the COVID-19 outbreak. Figure 3 shows the SPR values of the control indicator for different businesses.

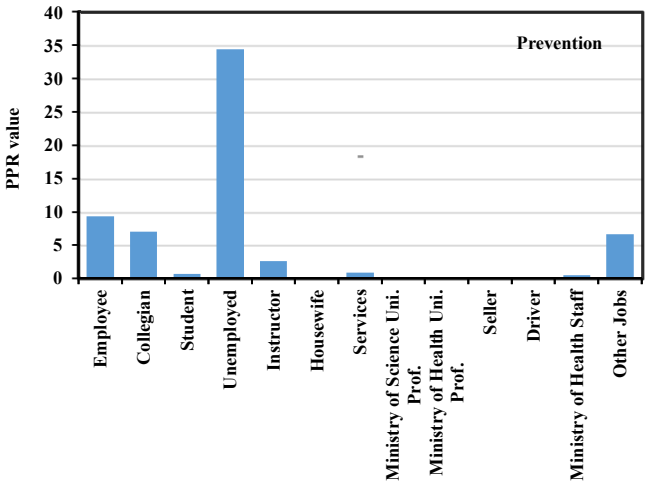

Figure 2. The SPR values for COVID-19 prevention in different jobs

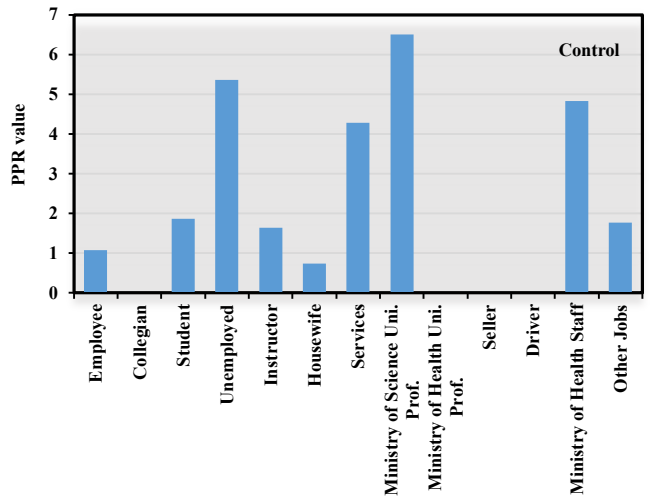

Figure 3. The SPR values for the COVID-19 control agents in different jobs

The findings indicate that the value of this indicator is higher for professors in the Ministry of Science than for unemployed individuals, professors in the Ministry of Health, and service workers. Given that professors and service workers have the most physical contact with diverse individuals and students, they hold a positive view of the implementation of control measures and social distancing. Conversely, professors in the Ministry of Health have been in close contact with patients in critical conditions since the onset of the disease and recognize the sensitivity and importance of the issue. As a result, they consider disease control and prevention strategies to be effective and the only viable solution to halt the spread of the disease. In Figure 4, the SPR values of treatment indicators are shown for different occupations. The SPR for students is higher than for other groups, emphasizing the need to find a cure for COVID-19. Individuals in various occupational groups have a high value of the treatment indicator, indicating their willingness to receive a vaccine. Government planning and control are necessary for prioritizing vulnerable individuals. The study highlights the importance of physical health in COVID-19 recovery. The Conflict Resolution Index (IR) is positive (+1) for various occupations, indicating a positive attitude toward COVID-19 measures and treatment decisions. In Figure 5, the SPR values of the causative agent indicator are shown for different occupations.

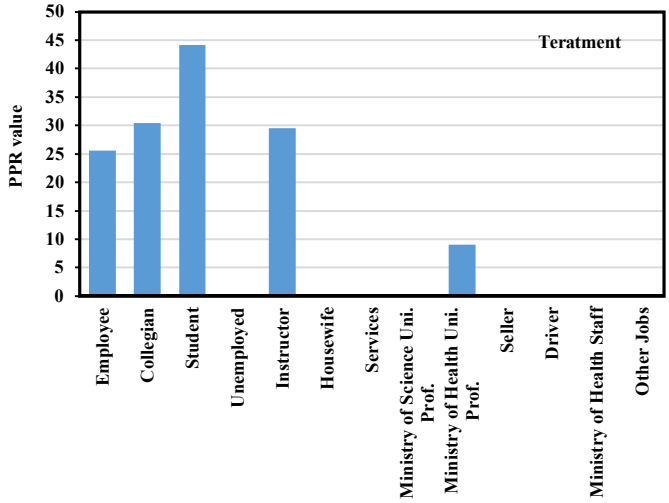

Figure 4. The SPR values for the COVID-19 treatment of different jobs

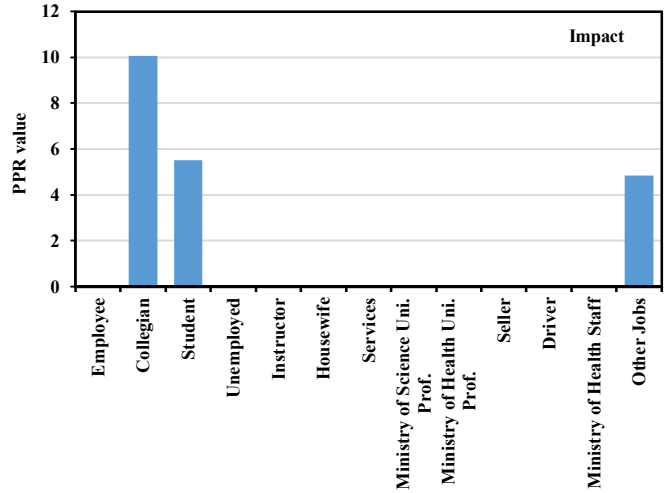

Figure 5. The SPR values for the COVID-19 impact on different jobs

Based on the scores assigned to these questions and the corresponding graph, it appears that the SPR is higher for college students than for other groups, indicating the significance of this issue for college students who are more concerned about their future and health. The COVID-19 pandemic has affected the way these groups were taught, with most classes being held virtually. As the disease spread, some jobs were lost or performed remotely. The higher SPR score for other occupations highlights the importance of this issue for individuals whose livelihoods have been adversely

affected. The IR is positive for all groups, indicating their awareness of the impact of COVID-19 on various aspects of social and individual life. The SPR and IR were utilized to assess the approach and attitudes of different groups toward resolving the pandemic and the management measures implemented by the Ministry of Health and executive bodies. The attitudes of various business groups toward COVID-19 were analyzed to determine the importance, position, and power of the participants concerning prevention, control, treatment, and impacts. Table 5 presents the values of these indicators, SPR, and IR for different occupational groups in the study. The findings reveal that participants have positive knowledge, awareness, and attitudes toward preventive measures for COVID-19, which is crucial in limiting the spread of the disease. Mass media and virtual platforms played a vital role in disseminating this information, resulting in increased participation and changed behaviors and habits to prevent the spread of the virus. Table 5 indicates that the IR for the group of housewives and professors in the Ministry of Science is +1, demonstrating a positive approach and high acceptance of the issue among this group. If preventive or control measures are implemented, these groups are likely to have the highest acceptance and participation in executive decisions of the Ministry of Health. The IR value is zero for service jobs, drivers, and professors in the Ministry of Health, while it is negative for students and staff in the Ministry of Health. Thus, this group is likely to have the most opposition to the implementation of Ministry of Health actions. Based on the table, it appears that college students have a higher SPR score than other groups, indicating the significance of the issue for them. Conversely, university professors in the Ministry of Health have a lower SPR score, suggesting that they may not view the issue as important. In terms of the IR, the values are positive for most groups, indicating their awareness and positive approach toward the issue. However, the IR is negative for the staff of the Ministry of Health, suggesting that they may not be open to implementing actions to address the problem. In this regard, Movahed *et al.* (2023) investigated health literacy's association with the social influences of COVID-19 among police force employees in Iran. Their study revealed a noteworthy relationship between health literacy and the impact of COVID-19 on social influences among employees, indicating the potential effectiveness of educational interventions targeting health literacy in addressing these influences [11]. Also, Hosseinzadeh *et al.* (2023) through a review of the social consequences of the COVID-19 pandemic found that the pandemic crisis led to significant societal upheaval, unprecedented lifestyle changes, and considerable disruptions in social interactions, emphasizing the need for focused policies to support vulnerable groups in the crisis [5]. The current study has been conducted in a specific province, Ardabil, which might limit the generalizability of the findings to other regions or diverse demographic groups within the country. Also, the survey was conducted in June 2020, representing a snapshot of attitudes at that particular time, potentially lacking the assessment of evolving attitudes over time as the pandemic progressed. Thirdly, the study primarily focused on attitudes within different occupational groups, potentially overlooking other influential factors such as geographical, cultural, or socioeconomic variations that could significantly impact attitudes toward the pandemic. Additionally, while the SPR method provided valuable insights, its scope might not fully capture the multifaceted nature of attitudes and perceptions toward the pandemic.

Table 5. The SPR and IR values for prevention, control, treatment, and impacts of different occupational groups

Jobs	Prevention (Indicators)		Control (Indicators)		Treatment (Indicators)		Impacts (Indicators)	
	SPR	IR	SPR	IR	SPR	IR	SPR	IR
Employee	9.34	0.80	1.07	0.03	25.56	0.92	0.00	1.00
Collegian	7.00	0.75	0.00	0.15	30.38	0.93	10.0	0.81
Student	0.69	- 0.17	1.86	0.30	44.11	0.95	5.52	0.69
Unemployed	34.50	0.94	5.36	0.68	0.00	1.00	0.00	1.00
Instructor	2.62	0.44	1.63	0.24	29.50	0.93	0.00	1.00
Housewife	0.00	1.00	0.73	- 0.15	0.00	1.00	0.00	1.00
Services	0.89	- 0.05	4.28	0.62	0.00	1.00	0.00	1.00
Ministry of Science Uni. Prof.	0.00	1.00	6.50	0.73	0.00	1.00	0.00	1.00
Ministry of Health Uni. Prof.	0.00	0.00	0.00	- 1.00	9.00	0.80	0.00	0.00
Seller	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Driver	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
Ministry of Health Staff	0.50	- 0.33	4.83	0.65	0.00	1.00	0.00	1.00
Other jobs	6.66	0.73	1.76	0.27	0.00	1.00	4.83	0.93

Conclusion

Infectious diseases and pandemics are periodic phenomena which pose many challenges to society. The effects of these pandemics are often severe, and may negatively affect people's lives in different dimensions. Therefore, this study tried to evaluate the awareness and attitude of different groups of people toward prevention, control, treatment, and impacts of COVID-19 disease in the Ardabil province through the SPR approach. In the present study, different occupational groups, especially collegians, had a level of awareness and a positive attitude toward preventative

measures such as social distancing and compliance with personal hygiene principles. They considered mass media and virtual environment training appropriate. The control of the COVID-19 disease was of high importance for university professors and unemployed people. They were more willing to participate in governmental control measures such as quarantine and planning. The treatment of the COVID-19 disease is the most important for students. The study's findings suggest the need for tailored education and awareness campaigns to target different business groups. The results also highlight the importance of higher education in promoting a better understanding of the pandemic and its impacts. The study's identification of the most effective groups in prevention, control, treatment, and impact indicators can inform targeted interventions to improve public health outcomes during the pandemic and for future potential outbreaks, including new strains such as Omicron. Although the government has taken important measures to restrict the spread of the virus, further efforts are necessary to safeguard the most economically affected groups from the disease. Continued monitoring and evaluation of public attitudes and behaviors is crucial in adapting public health strategies to changing circumstances. Future research directions could focus on the effectiveness of tailored education and awareness campaigns for different public groups and age ranges to increase positive attitudes toward disease prevention and control measures. Additionally, the research could investigate the impact of social media and other communication channels in promoting a better understanding of infectious diseases and their effects on mental health. This research could investigate the effectiveness of current prevention and control measures in mitigating the spread of new strains and the need for additional interventions to address the challenges posed by emerging variants.

Authors' Contributions

Fatemeh Kateb: Data analysis; data visualization; interpretation of the results; study conception and design. Fahimeh Mirchooli: Data analysis; first draft preparation; study conception and design. Raoof Mostafazadeh: Supervision; conceptualization; data analysis; final editing; study conception and design.

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Conflicts of Interest

The authors declare that they have no competing interests.

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Ethical considerations

There were no ethical considerations to be considered in this research.

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