**תקציר**

**רקע:** מגפת הקורונה  COVID-19פגעה בצורה נרחבת בבריאות הציבור הבינלאומית וגררה מגבלות תנועה וריחוק חברתי בכל רחבי העולם. פנדמיה מהווה משבר המלווה בהתפתחות תסמינים נפשיים כמו חרדה העלולה להשליך על האוכלוסייה הכללית בכלל ועובדי בריאות בפרט.

**מטרה:** לבחון השפעתם של גורמים אישיים, תפיסות כלפי נגיף הקורונה והתמודדות עם המגיפה על מידת החרדה בקרב האוכלוסייה הכללית ובקרב עובדי בריאות בראשית התפרצות המגיפה במדינת ישראל.

**שיטה:** במחקר חתך בדגימת כדור שלגהופץ שאלון ברשתות החברתיות. המדגם כלל696 משתתפים מהאוכלוסייה הכללית ו- 470 משתתפים בקרב עובדי הבריאות.

**תוצאות**: בקרב עובדי בריאות דווח על מידת חרדה גבוהה יותר (6.72 ±4.46) מאשר באוכלוסייה הכללית (M:6.04 ±4.22) 0.01<P. הגורמים האישיים שהסבירו 19.3% מהשונות המוסברת של מידת החרדה בקרב עובדי הבריאות כללו מגדר, מוצא אתני, שהות בבידוד ותפיסות אודות נגיף הקורונה ועמדה כלפי חשיבות הבידוד.

**מסקנות:** רמות החרדה הנמוכות יחסית מוסברות בעיתוי הפצת השאלון שנערך בשלבים הראשוניים להתפרצות נגיף הקורונה בישראל. יחד עם זאת, מידת החרדה הגבוהה בקרב עובדי הבריאות טמונה בכך שהיו שותפים בהכנות פנים ארגוניות במרכזיים הרפואיים לקראת המגיפה, וכללו, גיוס משאבים כמו מכונות הנשמה, הקצאת כוח אדם והדרכתו למיגון, משקפים הבנה מעמיקה של עובדי הבריאות על העומד להתרחש.

**Introduction**

The Coronavirus epidemic (COVID19) broke out in China in late 2019 (Lu, Stratton, & Tang, 2020), spreading to many countries around the world within a few short weeks (Zu et al., 2020). COVID19 was identified as the cause of the epidemic by the World Health Organization (World Health Organization, 2020a) and declared within three months as a pandemic (World Health Organization, 2020b). Covid-19 mainly affects the respiratory system, in most cases causing mild symptoms such as dry cough, but in some cases, it leads to severe respiratory disease, high contagion and mortality (Wang, Tang, & Wei, 2020). This reality has created a global challenge to public health security (Li et al., 2020), leading to a series of unprecedented steps including rigorous airport inspections, lockdown, border closures and cancellation of international events (Chinazzi et al., 2020).

The outbreak of an infectious disease is a time of crisis, especially when it occurs on a pandemic level, causing anxiety and uncertainty (Huang & Zhao, 2020; Roy et al., 2020). Anxiety increases when the virus infection is perceived as an imminent possibility and is linked to the adoption of new behaviors such as wearing face masks and practicing social distancing (Goodwin, Haque, Neto, & Myers, 2009; Leung, 2005). Research indicates that knowledge and clear behavior guidelines help to reduce anxiety (Rubin, Amlôt, & Wessely, 2009; Griffin, Neuwirth, Dunwoody, & Giese, 2004; Lim et al., 2020; Wray et al., 2008). Anxiety levels stemming from the outbreak of an epidemic are related to a variety of factors. studies have found that risk factors for high anxiety levels during an epidemic are being female, younger age and low educational level. (Leung, 2005(, while those in higher socioeconomic social classes and are more educated have higher levels of optimism and are more likely to adopt practices necessary to stop the virus from spreading (Zhong at al., 2020).

The severity of anxiety varies among healthcare workers. COVID19 is a new disease, with severe consequences, whose clinical guidelines and prevention methods are constantly being updated. These changes are instilling confusion, fear and anxiety in the general population (Roy et al., 2020). Among health workers, anxiety may occur due to stressful work environments involving extreme physical exertion, high workloads, unstable patients and lack of protective equipment, while simultaneously dealing with concern for loved ones at home while they are on the front line with patients (Smith, Smith, Kratochvil, & Schwedhelm, 2017; Sun et al., 2020). Hence, the purpose of the present study was to examine the impact of personal factors and perceptions towards the Corona virus on anxiety levels among the general population and among healthcare workers at the outset of the pandemic’s outbreak in Israel.

**Method**

**Study Design**

A cross-sectional study was conducted where the data were collected online for one week (from March 13, 2020 to March 20, 2020). When the questionnaire was first distributed, 126 patients were diagnosed with Corona, two of whom were in moderate to severe condition and the others in mild condition. On the final day of the questionnaire, 677 patients suffered from Corona, 6 of them severely ill, 13 moderately ill and the others in mild condition. The study was reviewed and approved by the Ethics Committee of the Lev Academic Center.

**Study Sample**

Participants were recruited through snowball sampling. A questionnaire link was circulated on social networks via email, WhatsApp and Facebook focusing on social groups belonging to the healthcare professions. Participants were asked to forward the link to friends and colleagues. A total of 1,166 Hebrew speaking participants over the age of 18 with internet access participated in the survey the research population included 696 people from general population and 470 health care worker. The sample characteristics are described in Table 1.

**Data Collection**

The survey was available as a Google Form document. The beginning of the document included information about the purpose of the survey and a section related to participant consent. It was emphasized that participation in the survey was voluntary and anonymous and that it was possible to stop the survey at any stage. Data were collected and stored on Google Drive with access available only the researchers.

**Instruments**

*Socio-demographic details*: age, gender, marital status, number of children, Ethnicity, level of education, employment, residence, occupation in the health profession. In addition, Corona related information was collected, which included whether the participant was in isolation, the amount of time in isolation and the reason requiring isolation.

*Questionnaire concerning perceptions about Coronavirus*: The questionnaire was developed for the current research study. Initially, the questionnaire was validated by five experts,an Infectious Disease Physician, a Ministry of Health epidemiology nurse , an epidemiology nurse employed at a medical center, a senior manager and a social worker. The tool included 11 items, such as “the Coronavirus is a dangerous virus that can spread from person to person”; “Coronavirus is highly contagious requiring stringent isolation measures to prevent continuous infection”; “The healthcare system is working properly to prevent the outbreak of Coronavirus in Israel”.

Subjects were asked to rate their agreement on a Likert-like scale ranging from 0 (strongly disagree) to 3 (strongly agree). The Cronbach’s alpha of the questionnaire was 0.61. Principal factor analysis was subsequently performed, which demonstrated three factors that explained 49% of the variance. The Cronbach’s alpha of the factors; Perceptions and COVID-19 (α=0.59), isolation and COVID-19 (α=0.60) and Ministry of Health’s Functioning During the COVID-19 (α=0.70) .Table 1 below represents incorporation of all the variables regarding each of the factors.

*The Hospital Anxiety and Depression Scale) HADS*(: developed by Zigmond & Shait (1983), contains 7 items for self-report of anxiety, based on a 4-level Likert-like response scale ranging from 0 to 3. The score is calculated as a sum of all questionnaire details and the range of scores from 0 to 21, a high score indicating high anxiety. Cronbach’s alpha in this study was 0.85.

**Findings**

**Descriptive Statistics**

Table 2 shows that most of the participants were young Jewish women up to the age of 32, married, with no pre-existing conditions. Among healthcare workers, most of the participants worked as nurses and the vast majority worked in clinical positions.

Health workers reported higher anxiety levels than the general population and their satisfaction with the health system’s actions was lower (Table 3). Since anxiety levels among health workers was higher than the general population, we examined what factors predict healthcare worker anxiety, first using t tests and then linear regressions were performed in stages. Table 3 describes the results of the t-tests for independent samples examining differences between healthcare workers and the general population on anxiety levels and the components of the Corona virus questionnaire.

Non-Jewish, participants holding clinical positions, who work full-time, below the age 32, live alone and were not in isolation, reported higher levels of anxiety (Table 4).

A linear-regression analysis was then performed, where the first step included socio-demographic variables found to significantly correlate (gender, nominal age, Ethnicity, clinical position and employment) with anxiety Table 5 below presents the results of the regression analysis. Thesame regression analysis was performed on the study’s general population participants just report final step.

**Discussion**

The purpose of the current study was to examine the influence of personal factors and perceptions of the corona virus on the level of anxiety among health workers and the general population at the beginning of the outbreak of the pandemic in the State of Israel. Results indicate that the degree of anxiety among the participants was relatively low, but the health workers reported higher anxiety. The results may be explained by the timing of the data collection, during the initial stages of the Corona virus outbreak in Israel. The fact that the number of verified patients was low and that there were no deaths possibly explains the low anxiety levels and that the consequences of the disease were perceived as being very severe. In addition, the Ministry of Health guidelines for the general population focused on specific details such as restrictions on those returning from foreign countries and on events with large numbers of people (over 5,000 people).

In addition, the public is required to enter isolation if exposed to verified Corona patients, according to the findings of the epidemiological investigations conducted by the Ministry of Health (Ministry of Health, Israel 3.2020). These actions may have led to a sentiment that the disease is under control and the details provided by the Ministry of Health on the locations visited by verified patients serves to reduce fear surrounding contagion. Furthermore, the disparity between the state of Israel and reports in the world that reflected a different and difficult situation, for example in Italy, was reported in early March that about 10 percent of contractors needed ventilation and intensiv

e care and 20% of medical staff contracted during their treatment of patients (Remuzzi, & Remuzzi).

Moreover, although Israel was relatively in control of the epidemic compared to other countries, publications of the dire situation in various countries around the world, such as Italy and Spain, resulted in increasing anxiety among healthcare workers, fueling fear of the most pessimistic outcomes. In early March, it was reported that about 10% of those infected in Italy required life support respirators and hospitalization and 20% of medical personnel contracted Covid-19 (Remuzzi, & Remuzzi, 2020), and in Spain that over 1,000 new cases were reported daily (Legido-Quigley et al., 2020).

The announcement by the World Health Organization that COVID-19 was a pandemic (World Health Organization, 2020b) influenced the degree of anxiety of the research participants.

 Health workers scored higher anxiety levels compared to the general population. This result might be explained by the increased knowledge of healthcare workers related to the consequences of the disease as well as health workers were partners in the medical organizational preparation for the pandemic. These preparations included increasing resources, both physical and human resources, able to care for ventilated and infected patients. In addition, health workers expressed lower levels of support

בחלק השלישי של שאלון המחקר (Ministry of Health’s Functioning During the covid-19)

 for the health care system as compared to the general population with respect to its handling of the pandemic. Healthcare professionals understood the potentially limited of the healthcare system at that point in time to cope with the pandemic if it were to hit the country full force, as occurred in other countries such as Italy (Remuzzi, & Remuzzi, 2020).

. The personal characteristics that contributed to understanding the degree of anxiety among healthcare workers indicated that women in minority groups reported a higher level of anxiety. These findings coincide with other studies (Leung et al., 2005; Rubin et al., 2009). It is possible that the women feel less supported during stressful situations, possibly leading to higher levels of anxiety similarly to the research (Othman, 2020).

Minorities working in the health care system were also more concerned about their family members when they were at the forefront of work in medical centers and were unable to support their family members and to mediate the Ministry of Health guidelines. In this context, it should be noted that during the research period, the Arabic language guidelines were not yet applied. It can be further assumed that the fear of catching up with their families also increased the anxiety among those workers.

Health workers belonging to minority groups were also concerned for their families while they were on the front line in medical centers and were unable to support their families and to communicate to them the guidelines of the Ministry of Health. In this context, it should be noted that during the research period, the guidelines were not made accessible in the Arabic language. It can be further assumed that the fear of infecting family members also contributed to the anxiety among minority healthcare workers.

Research limitations include the method of sampling, snowball sampling, and of data collection ­­­­­­(online questionnaires), leading to a biased sample that might not represent the study populations. In addition, the survey was conducted one time only, when the outbreak was relatively new. Recommendations for continued research include repeating the survey with other populations and conducting a longitudinal study to examine changes over time.

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**Table 1: Analysis of factors with Varimax rotation: perceptions COVID-19 questionnaire**

|  |  |  |
| --- | --- | --- |
| Num | Item | Factor Loadings  |
| PerceptionsandCOVID-19 | Isolation and COVID-19 | Ministry of Health’s Functioning During the COVID-19 |
| 2 | COVID-19 complications | **.646** | .267 | -0.08 |
| 9 | Society's perception towards people exiting isolation | **.633** | .029 | .112 |
| 8 | Society's perception towards people in isolation | **.618** | -.163 | -.044 |
| 5 | Perception of treatment | **.579** | -.058 | .172 |
| 4 | Risks associated ith isolation | **.553** | .245 | -.002 |
| 6 | Disease exacerbation signs | .407 | -.008 | .277 |
| 3 | Tools for reducing contagion | .006 | **.769** | .098 |
| 7 | Mandatory isolation for confirmed COVID-19 patients | -.037 | **.703** | .090 |
| 1 | Means of Contagion | .144 | **.697** | .088 |
| 10 | Preventative measures of Ministry of Health’s against the virus outbreak  | .061 | .117 | **.850** |
| 11 | Advocacy activity of the health system | .013 | .167 | **.841** |

**Table 2: Descriptive variables for study participants**

|  |  |  |  |
| --- | --- | --- | --- |
| Healthcare Workers(N-470) | General Population(N-696) | Values | Variable |
| 126 (26.8) | 215 (30.9) | Men | Gender |
| 344 (73.2) | 481 (69.1) | Women |
| 198 (42.1) | 386 (55.5) | Below age 32 | Age  |
| 272 (57.9) | 310 (44.5) | Above age 32 |
| 148 (31.5) | 266 (38.2) | Single | Marital status |
| 322 (68.5) | 430 (61.8) | In relationship |
| 278 (59.1) | 545 (78.3) | Jewish | Ethnicity |
| 192 (40.9) | 151 (21.7) | Non-Jewish ((Muslim/Christian/ Druze) |
| 410 (87.2) | 618 (88.8) | Yes | Comorbidity |
| 60 (12.8) | 78 (11.2) | No |
| 75 (16) | 79 (11.4) | Yes | Smoking |
| 395 (84) | 617 (88.6) | No |
| 55 (11.7) | 102 (14.7/) | Yes | Isolation |
| 415 (88.3) | 594 (85.3) | No |
|  | 50 (10.6) | Doctor | Role (n=470) |
| 291 (61.9) | Nurse |
| 69 (14.7) | Para-medical |
| 34 (7.2) | Senior- management |
| 26 (5.5) | Administrative |
| 410 (87.2) | Clinical | Clinical position(N-470) |
| 60 (12.8) | Non-clinical |

**Table 3: “t” tests for independent samples for examining differences between the general population and health workers**

|  |  |  |
| --- | --- | --- |
| t | Average (standard deviation) | Variable |
|  | Healthcare Workers | General Population |  |
| -2.63\*\* | 6.72 (4.47) | 6.04 (4.22) | Anxiety (0-21) |
| 1.28 | 1.65 (0.38) | 1.67 (0.35) | Perceptions of the covid-19 (0-3) |
| -1.68 | 2.64 (0.46) | 2.59 (0.45) | Isolation and the covid-19 (0-3) |
| 2.19\* | 2.02 (0.74) | 2.11 (0.70) | Ministry of Health’s Functioning During the covid-19 pandemic (0-3) |
| -1.43 | 36.00 (11.6) | 34.8 (14.4) | Age (year) |

\*p<0.05 \*\*p<.001

**Table 4: t-tests for independent samples examining differences on anxiety levels based on demographic characteristics for the general population and for healthcare workers**

|  |  |  |  |
| --- | --- | --- | --- |
| Healthcare Workers | General Population | Values | Variable |
| t/f | standard deviation | Mean | t/f | standard deviation | Mean |
| -4.48\*\* | 3.48 | 5.15 | -5.07\*\* | 3.86 | 4.84 | Men | Gender |
| 4.59 | 7.17 | 4.26 | 6.57 | Women |
| 4.59\*\* | 4.62 | 7.70 | 1.61 | 4.35 | 6.27 | Below age 32 | Age (nominal) |
| 4.08 | 5.84 | 4.03 | 5.75 | Above age 32 |
| 4.06\*\* | 4.67 | 7.83 | 2.17\* | 4.35 | 6.48 | Single | Marital status |
| 4.18 | 6.07 | 5.76 | 4.10 | In relationship |
| -2.03\* | 4.43 | 6.25 | -0.35 | 4.02 | 5.74 | Full | Employment |
| 4.21 | 7.15 | 4.20 | 5.86 | Not full |
| -6.05\*\* | 1.01 | 5.64 | -4.43\*\* | 4.14 | 5.67 | Jewish | Ethnicity |
| 4.57 | 8.06 | 4.25 | 7.37 | Non- Jewish (Muslim/Christian/ Druze) |
| 0.00 | 4.40 | 6.63 | 0.64 | 4.30 | 6.07 | Yes | Comorbidity |
| 4.50 | 6.62 | 3.50 | 5.75 | No |
| 1.28 | 4.76 | 7.23 | 1.20 | 4.35 | 6.58 | Yes | Smoking |
| 4.34 | 6.51 | 4.20 | 5.97 | No |
| -3.61\*\* | 3.75 | 4.63 | -2.13\* | 3.86 | 5.22 | Yes | Isolation |
| 4.43 | 6.89 | 4.26 | 6.18 | No |
| 2.44\* | 4.45 | 6.82 | No relevant | Clinical | Clinical position |
| 3.93 | 5.33 | Non-clinical |

\*p<0.05 \*\*p<.001

**Table 5: Results of linear regression predicting anxiety among health workers**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| R2 | t | β | B | Variable | Step |
| 0.142 | 5.01\*\* | 0.24 | 2.42 | Gender | 1 |
| 0.47 | -0.02 | -.206 | Employment |
| 4.52\*\* | 0.24 | 2.23 | Ethnicity |
| -0.64 | -0.03 | -.312 | Age (nominal) |
| -1.74 | -0.08 | -.81 | Marital status |
| 0.90 | -0.00 | -0.06 | Clinical position |
| 0.155 | 4.75\*\* | 0.23 | 2.25 | Gender | 2 |
| 0.52 | -0.02 | 0.22 | Employment |
| 3.69\*\* | 0.20 | 1.88 | Ethnicity |
| -0.93 | -0.05 | -0.45 | Age (nominal) |
| -1.96 | -0.09 | -0.91 | Marital status |
| -0.20 | -0.01 | -0.12 | Clinical position |
| 2.54\* | 0.11 | 1.69 | Isolation |
| 0.193 | 4.63\*\* | 0.22 | 2.17 | Gender | 3 |
| 0.54 | -0.02 | 0.23 | Employment |
| 2.97\*\* | 0.17 | 1.50 | Ethnicity |
| -0.69 | -0.03 | -0.33 | Age (nominal) |
| -2.39\* | -0.11 | -1.09 | Marital status |
| -0.19 | 0.00 | -0.11 | Clinical position |
| 2.49\* | 0.11 | 1.55 | Isolation |
| 2.07\* | 0.09 | 1.00 | perceptions of Coronavirus |
| 4.03\*\* | 0.19 | 1.71 | Isolation and Coronavirus |
| -1.68 | -0.07 | -0.44 | Ministry of Health’s  |

\*p<0.05 \*\*p<.001