Nurses’ perceptions of social rejection, resilience and well-being during COVID-19: A national comparative study

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Abstract

Aims and Objectives: To determine the level of social rejection and well-being of nurses, whether resilience is a mediator between them and to compare nurses who worked versus did not work on COVID-19 wards.

Background: During the COVID-19 pandemic health care workers reported psychological distress and social rejection.

Methods: An online survey was sent to nursing social media groups in Israel. Respondents completed a Demographic, Social Rejection, Resilience and General Well-being questionnaire.

Results: Two hundred and forty-seven nurses responded. The majority were female with a mean age of 43.6 years. Approximately one-third were worried about infecting their family members and many agreed that their family fears that the nurse will infect them. Nurses reported their partner, family members, neighbours and the public physically distanced themselves from them. Approximately one quarter reported feeling lonely. Statistically significant differences were found between those who worked versus not work on a COVID-19 unit on general well-being, and social rejection. No differences were found in resilience scores.

Conclusions: Social rejection was felt by many nurses as shown by an inverse relationship between the closeness of the relationship and the sense of social rejection and a high level of loneliness and depression. A higher level of social rejection and lower well-being were found among nurses working on COVID-19 wards as opposed to those who did not. General well-being was found to be exceptionally low during COVID-19. Resilience did not mediate the relationship between social rejection and general well-being.

Relevance to clinical practice: Perceived social rejection might be associated with decreased well-being. The level of resilience is related to the level of well-being among nurses in general. Nurses not working in COVID-19 wards have higher levels of well-being and less social rejection compared with nurses working in these wards.

KEYWORDS
beliefs, depression, nurse, professional boundaries, psychological well-being
1 | INTRODUCTION

The SARS-CoV-2 (COVID-19/Corona) virus has infected millions of people around the world, including healthcare workers (Bandyopadhyay et al., 2020). Nurses comprise the largest percentage of healthcare workers and are those who are most present around the patient’s bedside, potentially resulting in nurses being the provider population most at risk for becoming infected with the virus. Several sources have reported nurses becoming ill and even dying from the virus (Bandyopadhyay et al., 2020; Erdem & Lucey, 2021; Papoutsi et al., 2020).

These results have possibly led the general public to fear, avoid, shun or ostracise Health Care Workers (HCWs) as possible sources of transmission of the infection (Bagcchi, 2020). Fear of contagion has also led to discrimination against HCWs. Such episodes are increasingly reported from Asia, Africa, Europe, South and Central America, and the United States (‘In the Light of Coronavirus... Don’t Discriminate against Health Care Workers’).

1.1 | Background

A population-based Canadian study found that 30% of the general public (n = 623) believed that HCW were carriers of SARS-CoV-2 (Taylor et al., 2020). At the same time, many HCWs working with COVID-19 patients believe that they may infect their families, and therefore voluntarily take extreme safeguards such as leaving their homes and families and applying rigid self-inflicted social isolation (Rose, 2020). This conflict of interest is similar to previous epidemics, where HCWs were forced to weigh serious and imminent health risks to themselves and their families against their duty to care for the sick (Singer et al., 2003).

Recent studies have shown that the COVID-19 pandemic has affected the well-being of nurses (Cabarkapa et al., 2020). General well-being as defined by Dupuy in McDowell’s (2006) book is a subjective feeling that reflects an inner personal state that includes anxiety, depression, general health, positive well-being, self-control and vitality (McDowell, 2006). Well-being can also include a social aspect, as to how satisfied a person is with their social network (McDowell, 2010). Perceived social rejection might be associated with decreased well-being.

Cabarkapa and colleagues (2020) conducted a systematic review of 55 studies to determine the psychological impact of viral epidemics on HCWs. They found that studies reported a significant impact on HCW’s well-being, including depression, anxiety, and stress-related disorders. They also reported that one of the major mental challenges to these workers was feelings of social rejection or isolation due to fears of infecting others. Those most at risk were females and nurses. A Taiwanese study examining the effect of the SARS epidemic on 753 nurses examined factors influencing medical staffs’ decisions to quit their jobs. The questionnaire consisted of seven factors. Two of the factors predicting leaving their place of employment were that working with SARS patients affected social relationships and the fear of infecting family and friends caused social isolation (Shiao et al., 2007).

Several other factors could be associated with perceived well-being. The first is admiration or support by friends and family and the public for the dedication of nurses who work with COVID-19 patients. HCWs treating patients with COVID-19 have been celebrated as ‘noble heroes’ not only due to their dedication under conditions that constituted a very real risk to their health but also due to these difficult personal sacrifices (Lipworth, 2020).

Another factor is resilience. Resilience has been defined as a positive adjustment in the face of adversity; the process of identifying or developing resources and strengths to flexibly manage stressors to gain a positive outcome, a sense of confidence/mastery, self-transcendence and self-esteem or the ability to recover from stress (Smith et al., 2008).

Resilience is identified as essential for nurses in their daily work (Tusaie, 2004). Albott and colleagues (2020) present an overview of the potential psychological stressors’ responses to the COVID-19 outbreak with resilience promoting strategies. Fear, anxiety, anger related to a threat to safety in transmitting COVID –19 to family or self was one of the stress risk factors affecting resilience (Albott et al., 2020).

Several recent studies have found that the level of resilience is related to the level of well-being among nurses in general (Kim et al., 2019; Shaw, 2020; Yu et al., 2019), and during the COVID-19 pandemic in China (Li et al., 2020).

Few if any studies were found that described differences in the perceptions of social rejection, resilience, public support/admiration and general well-being in nurses working on COVID-19 wards versus those not employed there. In addition, we did not find previous studies that determined whether resilience or public support/admiration serves as a buffer between perceptions of rejection and general well-being for those working or not working on COVID-19 wards.

Currently, information on the nursing population and the sense of social/family isolation during the COVID-19 epidemic is lacking. Therefore, this study aimed to compare nurses working on COVID-19 wards versus those not working on such wards and to determine whether resilience has any relationship in mediating social rejection and general well-being.
2 | METHODS

2.1 | Study design

This study was a cross-sectional online survey. Strobe checklist for reports of cross-sectional studies can be found in Supplementary File 1.

2.2 | Setting

The survey was distributed via social networks of nurses living throughout Israel. ‘Data collection was performed using snowball sampling; between October-December 2020 during the peak of the third wave. The digital questionnaire was distributed using social media, Facebook, LinkedIn and WHATSAPP. Surveys were initially sent to social media groups of the National Society of Intensive Care Nursing, Academic Nurses, National Clinical Nurse Instructors, National Chapter of Sigma Theta Tau, National Society of Research Nurses, three nursing schools faculty and five institutions of higher learning. Respondents were asked to pass the survey on to their colleagues.

2.3 | Participants

Participants were registered nurses living and working in Israel during the pandemic.

2.4 | Instruments

The online survey was composed of four sections: A Social rejection questionnaire, the Brief Resilience Scale (Smith et al., 2008), the General Well-being Schedule (McDowell & Newell, 1996), and a work and a personal demographic questionnaire.

2.5 | Social rejection

Social rejection: This questionnaire was developed for this study based on the current literature on health care workers stigmatism (Ramaci et al., 2020; Taylor et al., 2020). A group of administrators and research nurses in constructed the questionnaire. They decided which factors wanted to study and reviewed each item to ensure its construct validity.

The questionnaire consisted of 14, five-point, Likert-style questions. Eleven questions addressed the participant’s perception of social rejection by other HCWs, partners, family members, neighbours and the general public during the COVID-19 pandemic (Cronbach Alpha for 11 social rejection items = 0.86). Higher scores reflect higher levels of perceptions of social rejection. Another three questions described participants’ perceptions of admiration and support from the public and other HCWs (Cronbach Alpha = 0.72). These items were negatively coded when combining all of the items for the total Social Rejection Score. Cronbach Alpha for entire scale was α = 0.80.

Additional questions included two yes/no questions of whether the participant worked on a COVID-19 unit and whether they volunteered to work there. A third question, on a 10-point VAS scale, asked to what extent respondents would be willing to volunteer to return to work on a COVID-19 ward. The questionnaire underwent content validity by a panel of experienced ICU nurses, researchers and/or ICU nurses who worked on Corona wards. After the questionnaire was prepared the questionnaire was piloted on nurses active in the national society for cardiac and critical care nurses. Several minor modifications were made to wording before final distribution.

Three yes/no questions of whether the respondent worked on a COVID-19 ward or unit; whether he or she volunteered to work there, was transferred or was asked by the administration to work on a COVID-19 ward.

2.6 | Resilience questionnaire

The Brief Resilience Scale (Smith et al., 2008) is a six-item, five-point, Likert scale measuring the ability to recover or bounce back from stress. Higher scores reflect higher levels of resilience Internal consistency and test-retest reliability were found to be acceptable as well as its concurrent and discriminant predictive validity (Smith et al., 2008).

2.7 | General Well-being Schedule

This questionnaire was originally designed by Dupuy and reported by McDowell and Newell (1996). The instrument contains 14 items on a six-point Likert scale as well as four questions on a scale from 0 to 10. The questionnaire includes both positive and negative questions and a higher score reflects a more positive sense of general well-being. The instrument is divided into six dimensions including anxiety, depression, general health, positive well-being, self-control and vitality. The authors describe cutoff points: where scores of 0–60 describe severe distress, 61–72 is moderate distress and 73–110 reflects positive well-being. McDowell and Newell (1996) report appropriate levels of reliability and validity for the tool.

2.8 | Work and personal characteristics

Work and personal characteristics questionnaire included questions related to age, sex, family status, religion (a measure of ethnicity in Israel), number of children, years of experience as a registered nurse, regular ward of employment, percentage of employment, level of nursing education and type of post-basic certification, if relevant.
2.9 | Data analysis

Descriptive statistics (mean, median, standard deviations and frequencies) were analysed to describe the sample as well as responses to the study instruments. Independent sample t-tests and Analyses of Variance were used to determine differences between groups. Pearson Product Moment Correlations analysed associations between interval level data. A regression model was built to determine whether resilience served as a mediator variable between social isolation and general well-being.

2.10 | Ethical considerations

This research received Ethical approval. The online data form was anonymous and access to the data was available only to the researchers. A short paragraph at the beginning of the questionnaire specified that completion of the questionnaire implied consent to participate and that the participant was free to cease questionnaire completion at any time.

3 | RESULTS

A total of 247 nurses completed the questionnaire. The majority were female (n = 207, 83.8%), with a mean age of 43.6 (SD = 10.2). Most were married (n = 184, 78.0%) and Jewish (n = 186, 79.8%). Half of the participants (n = 125, 54.4%) had two or three children. Respondents worked a mean of 18.1 (SD = 11.4) years as a nurse with the vast majority having completed post-basic certification (n = 192, 80.7%). Post-basic certification is obtained when a registered nurse completes a 1–2 year course that includes theoretical and clinical content in a specialty clinical area such as Intensive Care, Midwifery or Oncology, whose curriculum is designated by the Ministry of Health.

All of the participants were graduates of an academic degree. (Table 1). Almost half of the sample reported that they worked on a COVID-19 unit (n = 110, 45.6%). Only 64 of them (26.9% of the total sample) reported that they volunteered to work there approximately half (n = 104, 42.7%) strongly agreed (scores of 7–10 on a 10 point scale, M = 5.99, SD = 3.3), that they would volunteer to return to work on a COVID-19 ward if asked.

Concerning social rejection, scores ranged from 1 to 5, with higher scores reflecting higher perceptions of rejection by the respondent. Approximately one-third of the respondents reported being worried about infecting their family members (n = 95, 38.4%, M = 2.98 out of 5, SD = 1.4) and many nurses agreed that their family fears that the nurse will infect them (n = 104, 43.3%, M = 3.11 out of 5, SD = 1.5). Nurses reported feeling that their partner (n = 13, 5.3%, M = 1.19 out of 5, SD = 1.1) family members (n = 27, 11.0%, M = 1.8 out of 5, SD = 1.3), neighbours (n = 50, 20.4%, M = 2.09 out of 5, SD = 1.4) and the public (n = 81, 32.9%) physically distance themselves from them. Approximately one quarter reported feeling lonely (n = 45, 22.6%). On the other hand, some nurses felt admiration of the public (n = 60, 24.4%) and recruited strength from them (n = 49, 20.2%). (Table 2).

Resilience scores have a possible range of 6–30, with higher scores reflecting higher levels of resilience. The mean resilience score was 17.9 (Median = 18.0, SD = 3.2), with a mean item score of 3.0 (SD = 0.53) out of a possible 5 points. Most reported having to take time to get over difficult events (n = 129, 53.1%) while at the

### Table 1: Demographic and work characteristics

| Variable                        | n   | %    |
|---------------------------------|-----|------|
| Gender                          |     |      |
| Male                            | 40  | 16.2%|
| Female                          | 207 | 83.8%|
| Age                             |     |      |
| 25–35                           | 59  | 24.1%|
| 36–45                           | 87  | 35.5%|
| 46–55                           | 59  | 24.1%|
| 56–64                           | 40  | 16.3%|
| Missing                         | 2   |      |
| Family status                   |     |      |
| Single                          | 31  | 13.1%|
| Married                         | 184 | 78.0%|
| Divorced/separated              | 17  | 7.2% |
| Widowed                         | 4   | 1.7% |
| Missing                         | 11  |      |
| Religion                        |     |      |
| Jewish                          | 186 | 79.8%|
| Muslim                          | 27  | 11.6%|
| Christian                       | 13  | 5.6% |
| Druze                           | 2   | 0.9% |
| Other                           | 5   | 2.1% |
| Missing                         | 14  |      |
| Professional Years of Experience|     |      |
| 0–10                            | 76  | 31.8%|
| 11–20                           | 68  | 28.4%|
| 21–30                           | 55  | 23.0%|
| 31–43                           | 40  | 16.7%|
| Missing                         | 8   |      |
| Educational Level               |     |      |
| BA                              | 127 | 54.5%|
| MA                              | 104 | 44.6%|
| PhD                             | 2   | 0.9% |
| Missing                         | 14  |      |
| Post-basic certification        |     |      |
| Yes                             | 192 | 77.7%|
| No                              | 46  | 18.6%|
| Missing                         | 9   |      |
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same time reporting being able to quickly return to oneself \( (n = 142, 68.4\%) \) (Table 3).

Total general well-being scores have a possible range of 0–110. The mean total general well-being score was 56.2 (SD = 6.1). Approximately half-reported being in very low or low spirits or feeling ‘up and down’ \( (n = 112, 45.7\%) \). Most reported being extremely, very much or quite a bit depressed \( (n = 174, 71.0\%) \), worn out \( (n = 133, 54.2\%) \), while at the same time being able to live their lives fully \( (n = 159, 65.5\%) \) (Table 4).

Statistically significant differences were found between those who worked to a COVID-19 unit versus those that did not, on general well-being \( ([t(223) = 2.010, p = 0.046], yes: M = 55.14 (6.4) no: M = 56.85 (5.9)) \) and social rejection \( ([t(141) = 1.04, p = .001], yes: M = 2.52 (0.75) no: M = 2.12 (0.67)) \). No differences were found in resilience scores. When comparing those who volunteered with those who did not volunteer, no statistically significant differences were found on general well-being, social rejection or resilience scores.

### Table 2 Social rejection scores

| Item                                                                 | M (SD) | Not at All n (%) | Rarely n (%) | Sometimes n (%) | Often n (%) | Always n (%) | Not Relevant n (%) |
|----------------------------------------------------------------------|--------|------------------|--------------|-----------------|-------------|--------------|-------------------|
| 1. I am afraid that due to my work in the hospital there is a chance that I will infect my family (missing:0) | 3.0 (1.4) | 36 (14.6) | 49 (19.8) | 59 (23.9) | 51 (20.6) | 44 (17.8) | 8 (3.2) |
| 2. My partner physically distances from me at home from fear of becoming infected (missing:1) | 1.2 (1.1) | 131 (53.3) | 21 (8.5) | 22 (8.9) | 11 (4.5) | 1 (0.8) | 59 (24.0) |
| 3. My family fears that I will care for corona patients and infect them (missing:1) | 3.1 (1.5) | 45 (18.3) | 41 (16.7) | 53 (21.5) | 42 (17.1) | 62 (25.2) | 3 (1.2) |
| 4. My family physically distances themselves from me when I am with them (missing:1) | 1.8 (1.3) | 112 (45.5) | 45 (18.2) | 41 (16.7) | 16 (6.5) | 11 (4.5) | 21 (8.5) |
| 5. My friends and neighbours physically distance themselves from me when I am with them (missing:2) | 2.1 (1.4) | 87 (35.5) | 53 (21.6) | 34 (13.9) | 33 (13.5) | 17 (6.9) | 21 (8.6) |
| 6. I feel admired among people outside of the hospital who are around me because I am a healthcare worker during the pandemic (missing:1) | 3.2 (1.5) | 51 (20.7) | 64 (26.0) | 59 (24.0) | 31 (12.6) | 29 (11.8) | 12 (4.9) |
| 7. People out of the hospital treat me differently and distance from me when they hear that I work at a hospital (missing:1) | 2.7 (1.4) | 53 (21.5) | 29 (11.8) | 69 (28.0) | 58 (23.6) | 23 (9.3) | 14 (5.7) |
| 8. I feel lonely because I work in a hospital during corona (missing:4) | 2.1 (1.5) | 101 (41.6) | 27 (11.1) | 37 (15.2) | 39 (16.0) | 16 (6.6) | 23 (9.5) |
| 9. I am afraid to tell my family about the risk that I am exposed to at work (missing:3) | 2.2 (1.5) | 104 (42.6) | 28 (11.5) | 42 (17.2) | 32 (13.1) | 25 (10.2) | 13 (5.3) |
| 10. I am afraid to tell neighbours/ friends that I work at a hospital (missing:3) | 1.4 (1.3) | 131 (53.7) | 19 (7.8) | 26 (10.7) | 15 (6.1) | 9 (3.7) | 44 (18.0) |
| 11. People around me after work hours strengthen me about my work at a hospital during the pandemic (missing:4) | 3.4 (1.5) | 67 (27.6) | 67 (27.6) | 50 (20.6) | 25 (10.3) | 24 (9.9) | 10 (4.1) |
| 12. Staff from other units distance from me when they hear that I care for corona patients (missing:0) | 1.6 (1.3) | 58 (37.9) | 29 (19.0) | 21 (13.7) | 12 (7.8) | 4 (2.6) | 29 (19.0) |

For Nurses working on corona units:

| Item                                                                 | M (SD) | Not at All n (%) | Rarely n (%) | Sometimes n (%) | Often n (%) | Always n (%) | Not Relevant n (%) |
|----------------------------------------------------------------------|--------|------------------|--------------|-----------------|-------------|--------------|-------------------|
| 13. Staff from other units compliment me for my work on a corona unit \( (n = 153) \) | 2.8 (1.7) | 27 (17.6) | 36 (23.5) | 34 (22.2) | 15 (9.8) | 17 (11.1) | 24 (15.7) |
| 14. People around me distance themselves from my family because I care for corona patients \( (n = 153) \) | 1.5 (1.3) | 65 (42.5) | 23 (15.0) | 21 (13.7) | 7 (4.6) | 5 (3.3) | 32 (20.9) |
Weak statistically significant correlations were found between general well-being and resilience \( (r = .13, p < .05) \) and between social rejection and resilience \( (r = .275, p < .01) \).

A regression analysis using social rejection, resilience and an interaction variable (product of social rejection and resilience) as predictors and general well-being as the criterion variable was conducted. The \( R^2 \) of the model was .019, \( F(3,129) = .84, p = .475 \), with none of the predictors statistically significantly contributing to the model (Table 5).

Resilience was not found to be a statistically moderating variable between social rejection and general well-being.

### DISCUSSION

During the COVID-19 pandemic, HCWs have been the dominant ‘soldiers’ fighting on the frontlines of this pandemic outbreak. Although the public praised and acknowledge them, this study demonstrated that HCWs felt physical rejection by the public. Our study indicated an inverse relationship between the closeness of the relationship to the nurse and the sense of social rejection as shown by an almost three-fold increase in feelings of social rejection between family members and the public. Nurses around the globe were reported as experiencing similar negative feelings during the
COVID-19 pandemic (Bagcchi, 2020). Similar results were found in Taiwan during the SARS outbreak, where 32% of the nurses felt that people are avoiding them. This was one of the reasons for their considering leaving their jobs (Shiao et al., 2007).

Although nurses felt less social rejection from their families, they were worried that they might infect them and thought their families were afraid of being infected. Maslow’s hierarchy of needs supports this finding. In his theory, safety is the second stage and is basic to human survival. At this level, the security of the body, employment, health and family safety is essential for a person to achieve their full potential (Maslow, 1943). The potential of being infected during nurses’ work was a threat and appeal to their security.

Social rejection was also demonstrated by our findings that almost one-fourth of the nurses felt lonely during the pandemic, and about half did not feel the public and friends appreciated their work. Moreover, a higher level of social rejection was found among nurses working on COVID-19 wards as opposed to those who did not. This finding is supported by a recent systematic review from 2002 to 2020 of the psychological impact of the pandemic outbreak on HCWs, where social isolation or rejection was demonstrated during the SARS outbreak, where HCWs felt distancing behaviour from their own families and discrimination from the public. Social isolation, a concept similar to social rejection, was found to mediate between working with SARS patients and psychological stress. Almost half of the HCWs felt stigmatisation and almost one-third felt ostracised by family members (Cabarkapa et al., 2020).

General well-being was found to be exceptionally low during COVID-19. The level of the general well-being of nurses found in this study was low and demonstrated severe distress. General well-being was significantly lower for nurses who worked on a COVID-19 ward than those who did not. This difference was found despite the fact that nurses who work on COVID-19 wards are more heavily protected against infection and more secure using the special personal protective equipment (PPE) compared to those who work outside of these COVID-19 units (Shreffler et al., 2020). Others have described the psychological impact of the pandemic on well-being, especially among HCWs. Stress, anxiety and depressive symptoms have been consistently reported and found to affect well-being (Marton et al., 2020; Vizheh et al., 2020). Others have also found that healthcare providers at the front line demonstrated more severe psychological symptoms than other HCWs (Vizheh et al., 2020). The well-being scores of HCWs in this study were lower than that found in the general Danish population, (a mean of 62 compared with 56 in this study) (Sønderskov et al., 2020).

Although we hypothesised that resilience might serve, as a mediator variable for general well-being and social rejection, our study did not support this assumption. We did not find resilience as a mediator of well-being even when comparing those who volunteered with those who did not volunteer. However, others found higher resilience as a strategy to protect personal stressors at the pandemic. Higher resilience was related to lower stress anxiety sleep and disturbance and fatigue for all HCWs (Huffman et al., 2020; Labrague & De Los Santos, 2020).

### 5 | CONCLUSIONS

The majority of nurses believed that their families were afraid that the nurse would infect them. Not only do nurses feel alone and unsupported while working with COVID-19 patients, they perceive that their major support system, their family, is afraid of being close to them. Nurses also perceived that working with COVID-19 patients, distances them from their partners, family members and the public. The sense of social rejection working with COVID-19 patients leaves nurses feeling lonely and unsupported, a heavy price to pay for being a professional. It is no wonder that nurses in this sample felt very low, extremely depressed and had low levels of general well-being.

#### 5.1 | Limitations

The investigators had very little control over study participant recruitment using a snowball-sampling methodology. Therefore, it is difficult to generalise our results to the entire Israeli nurse population. The time period in which the study took place was at the peak of the third wave. This also might have some effect on the study results. Nurses might have been too tired to participate in the study and there were many parallel studies ongoing at the same time, thereby decreasing the potential numbers of participants and affecting the generalisability of the findings. During the first wave, feelings of loneliness, rejection and low general well-being might have been different.

### 6 | RELEVANCE TO CLINICAL PRACTICE

- Perceived social rejection might be associated with decreased well-being.

| TABLE 5 | Regression analysis of Resilience as a moderator variable between Social Rejection and General Wellbeing Coefficientsa |
|----------|------------------------------------------------------------------------------------------------------|
| B        | Std. Error | Beta | t      | Sig.  |
| 1 (Constant) | 53.557 | 9.775 | 5.479 | 0.000 |
| Interaction resilience and social rejection | 0.448 | 1.390 | 0.195 | 0.322 | 0.748 |
| Mean Resilience | 0.817 | 3.112 | 0.064 | 0.263 | 0.793 |
| Mean social rejection score | −1.448 | 4.510 | −0.162 | −0.321 | 0.749 |

*aDependent Variable: recoded GWB total score.*
The level of resilience is related to the level of well-being among nurses in general

Nurses not working in COVID-19 wards have higher levels of well-being and less social rejection compared with nurses working in these wards

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CONFLICT OF INTEREST

None.

AUTHOR CONTRIBUTIONS

Authors JB, FDG, LY, SA, ILA, OK, all substantial contributed to conception and design and acquisition of data, and analysis and interpretation of data: JB and FDG drafted the manuscript. Authors JB, FDG, LY, SA, ILA, OK, all provided final approval of the version to be published. Each author participated completely in the work and take public responsibility for appropriate portions of the content. Authors JB, FDG, LY, SA, ILA, OK, all agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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