Original Article

Predicting Resilience of Hospital Nurses Based on Workplace Psychosocial Factors

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Article Info

Abstract

Background: This study aimed to predict the resilience of hospital nurses based on workplace psychosocial factors.

Materials and Methods: This cross-sectional study was conducted among 548 nurses working at an educational hospital in Iran in 2023. Samples were selected using the census method and inclusion criteria. Data were collected using a demographic questionnaire, the Copenhagen Psychosocial Questionnaire (COPSOQ), and the Connor–Davidson Resilience Scale (CD-RISC). Data were analyzed using the Independent T-test, One-way ANOVA, Pearson, and multiple linear regression tests.

Results: The mean and standard deviation of the CD-RISC total score was 75.9 ± 5.4. Four hundred fifty-six nurses (83.2%) reported low resilience. Significant statistical relationships were observed between resilience and gender, marital status, education (t=2.679, t=2.469, t=-2.061, $P<0.05$, respectively), categorized age, and work experience. Furthermore, a statistically significant correlation was found between four psychosocial factors and the mean resilience score ($r_{factor1}=0.457$, $r_{factor2}=-0.265$, $r_{factor3}=0.197$, and $r_{factor4}=-0.349$, all with $P<0.001$). The four psychosocial factors within the hospital environment predict 31.5% (Adjusted $R^2=0.315$) of the nurse's resilience. Low resilience is reported more frequently among females, married individuals, those with lower education, older individuals, and those with more work experience.

Conclusion: Psychosocial factors predicted approximately one-third of the resilience levels among nurses. Factor 1, which includes quality of leadership, social support from supervisors, rewards, justice and respect, trust, and predictability) had the greatest impact on nurses' resilience. By identifying and addressing these factors, healthcare organizations can, through implementing psychosocial interventions, create supportive work environments that promote nurse resilience and ultimately improve overall healthcare outcomes.

Keywords: Hospitals, Nurses, Psychosocial, Resilience, Workplace

Introduction

Resilience is a human trait that enables adaptation to risk factors and promotes mental well-being [1]. It involves facing challenging situations, maintaining focus, and fostering optimism for the future [2]. Resilience is significant among nurses due to numerous job-related risks [3].

When high stress levels in the workplace are not managed, it can negatively affect people's personalities and performance [4-6]. Some professional groups, such as nurses, work in stressful environments, which, if not controlled, can lead to anxiety, depression, secondary stress, and burnout. Stress and its consequences can also lead to a decrease in resilience [7, 8]. Research has shown that a high level of resilience is associated with reduced psychological harm and improved well-being among nurses. This resilience can protect nurses from experiencing negative psychological consequences [9].

Research conducted among Iranian nurses revealed a moderate level of resilience based on the mean score [10]. Enhancing nurses' flexibility can assist in reducing emotional exhaustion, increasing work engagement, and improving performance in the face of workplace challenges [11]. Therefore, nurses must possess high levels of flexibility and resilience to thrive in their profession and effectively manage stressors within the work environment [1, 12].

A study conducted on intensive care unit nurses found a significant correlation between resilience and their ability to maintain healthy psychological characteristics and employ positive coping skills when faced with workplace challenges [11]. Alonazi et al. found that higher levels of resilience were associated with lower levels of secondary traumatic stress (STS) and higher levels of compassion satisfaction [8]. Psychologists believe personality traits, family connections, and social support can enhance resilience [13]. Thus, identifying the factors that affect resilience can increase nurses' mental well-being [12]. Enhancing workplace resilience is an important strategy for healthcare settings to implement to support nurses' mental health and well-being and reduce related risks [4]. Additionally, having high resilience can help to eliminate negative influences in the workplace [5].

Research on workplace psychosocial factors has rapidly grown worldwide, with substantial implications for the work environment [14, 15]. The work environment can impact nurses' mental health [16, 17] as psychosocial risk factors are linked to work-related stress [4, 15]. The cumulative effect of stress and job challenges is adverse to nurses, including poor physical and mental health [18]. A study among Spanish nurses revealed that a high percentage perceive significant psychosocial risk factors in their duties, with around 41% potentially experiencing mental health issues [19].

Attention to the factors affecting nurses' health is crucial, considering their value as human resources [3]. Adverse psychosocial factors like effort-reward imbalance, excessive commitment, high job demands, and low influence at work contribute to nurses' intention to leave and are linked to poor mental health [14]. Work schedules and relationships with supervisors and colleagues influence nurses' general health and psychosocial well-being [16]. Developing countries often face more visible psychosocial risk factors, such as insufficient resources, high workload, failure workplace standards, patients' attitudes and behavior, weak interpersonal relationships among colleagues, and inadequate management and organizational structures [15]. The results of a systematic review conducted in 2019 showed that job demands (stress, burnout, post-traumatic stress disorder, and workplace bullying) were negatively related to resilience [8, 11], while job resources (such as coping skills, self-efficacy, social support, job satisfaction, job retention, and general well-being) showed a positive relationship with resilience [11].

Based on Cooper's integrative review, it was found that most studies have focused on individual factors affecting resilience, with fewer studies examining the work environment and conditions. Therefore, addressing environmental conditions to modify and improve them is necessary to promote nurses' resilience [9]. In addition, regular evaluation and educational programs help improve a healthy workplace and promote nurses' physical and mental well-being [8].

Nurses' health is of utmost importance due to its direct impact on the quality of patient care [20]. Therefore, it is crucial to identify the agents and risk factors that jeopardize nurses' mental and social health. The nature of the work, along with various psychosocial factors such as high stress, workload pressures, and abusive behavior in the hospital setting, can negatively impact nurses' resilience. Identifying the psychosocial factors that affect the ability to cope with adverse situations and maintain flexibility. This will allow nurses to demonstrate adaptability in challenging work conditions and protect themselves against psychological disturbances. By identifying these risk factors, we can pinpoint areas of weakness and develop solutions to enhance resilience. However, there is little research on the relationship between resilience and psychosocial factors in the hospital workplace among nurses. Additionally, no studies have predicted nurses' resilience using psychosocial factors. This study aimed to predict the resilience of hospital nurses based on workplace psychosocial factors.

Materials and Methods

This study was conducted among nurses working at an educational hospital in Iran. The samples were selected through a census and entry criteria. Data were collected using demographic information questionnaires, the Copenhagen Psychosocial Questionnaire (COPSOQ), and the Connor–Davidson Resilience Scale (CD-RISC). The COPSOQ questionnaire was utilized to assess psychosocial risk factors among nurses, as it encompasses a broad range of psychological elements. The CD-RISC questionnaire was selected for its effectiveness in identifying resilient individuals from those who are not. All questionnaires were distributed online to the nurses to minimize face-to-face contact and interactions, as the study was conducted during the later stages of the COVID-19 pandemic.

The present cross-sectional study was conducted in 2023 at a university educational hospital in Iran. The sample consisted of qualified nurses selected using a census method and meeting specific inclusion criteria. The criteria included having >1 year of clinical work experience, being free from physical and mental diseases, and not taking sedative drugs. Online

questionnaires were distributed among university medical science educational hospital nurses, and out of the initial 650 nurses, 26 were excluded based on the inclusion criteria, and 76 nurses declined to participate. Eventually, 548 nurses completed the questionnaires after providing informed consent.

During February and March 2023, nurses completed the following questionnaires online. The Demographic Questionnaire consisted of items related to gender, age, height, weight, marital status, work experience, and level of education.

Copenhagen Psychosocial Questionnaire (COPSOQ): The COPSOQ questionnaire, developed by Kristensen in 2005, is one of the most comprehensive standard questionnaires covering many psychological factors (Cronbach's alpha ranging between 0.61 and 0.80) [21]. In Iran, Aminian and colleagues have validated the COPSOQ questionnaire [22]. It consists of 32 questions organized into 16 dimensions and categorized into four factors. Factor 1 includes dimensions such as quality of leadership, social support from supervisors, reward, justice and respect, trust, and predictability. Factor 2 comprises self-rated health, burnout, stress, work-family conflict, and emotional needs. Factor 3 encompasses dimensions such as the meaning of work, commitment to the workplace, influence at work, and role clarity. Lastly, Factor 4 focuses on the dimension of offensive behavior. Participants responded to the questions on a Likert scale ranging from 0 (never or very little) to 4 (always or very much). Lower scores on each factor indicate better psychosocial conditions. The reliability and validity of the Persian version of this questionnaire have been established through measures such as internal consistency, with Cronbach's alpha ranging between 0.75 and 0.89 [22, 23].

Connor–Davidson Resilience Scale (CD-RISC): The CD-RISC questionnaire, developed by Connor and Davidson in 2003 (Cronbach's alpha was 0.89), can differentiate between resilient and non-resilient individuals in clinical and non-clinical populations, making it suitable for research purposes. The questionnaire consists of 25 questions that use a five-point Likert scale, ranging from 0 (completely false) to 4 (always true). It includes five subscales: personal competence, trust in intuition, acceptance of change, control, and spiritual influences. The final score, ranging from 0 to 100, is obtained by summing the scores of all the subscales for each individual. A score higher than 80 indicates high resilience. In Iran, the reliability of this questionnaire has been assessed using Cronbach's alpha method, yielding a coefficient of 0.89 [13, 24].

The normality of the data distribution was assessed using the Kolmogorov-Smirnov test, which indicated that all the data followed a normal distribution. To examine the relationship between demographic variables (gender, marital status, education, and categorized age) and occupational information (classified work experience) with mean resilience scores, the independent t-test and one-way ANOVA were performed. Pearson's correlation test was used to explore the relationship between age, work experience, psychosocial factors, and mean resilience scores. Multiple linear regressions were used to predict the influence of psychosocial factors on nurses' resilience. The dependent variable of resilience can be predicted based on four psychosocial factors in the workplace hospital setting using a multiple linear regression formula. Data analysis was conducted using SPSS version 24 software.

Results

The data analysis revealed that 71.4% of the participants in the current study were female nurses. The average age and work experience were 33.8±7.2 years and 9.4±6.9 years, respectively, with corresponding standard deviations. Table 1 presents additional demographic and occupational information, the CD-RISC sub-scale scores, and the four factors of the COPSOQ questionnaire. The mean CD-RISC total score was 75.9±5.4, with the highest score observed in the personal competence dimension. Psychosocial factor 1 obtained the highest score (Table 1).

Table 1. Descriptive statistics of demographic and occupational information, CD-RISC, and COPSOQ (N=548)

Demographic and occupational information					
Quantitative information			**Qualitative information**		
Variable	**Mean ± SD**	**Variable**	**Classification**	**Frequency**	**Percentage**
Age (yr)	33.8 ± 7.2	**Gender**	Male	157	28.6
			Female	391	71.4
Height (cm)	167.7 ± 7.4	**Marital status**	Single	205	37.4
			Married	343	62.6
Weight (kg)	71.4 ± 8.6	**Education**	Bachelor's degree	466	85.0
			Master's degree	82	15.0
Work experience (yr)	9.4 ± 6.9	**Age**	≤ 30	240	43.8
			31 – 40	174	31.7
			≥ 41	134	24.5
Age (yr) ≤ 30	27.5 ± 1.6	**Work experience**	≤10	357	65.1
31 – 40	34.1 ± 2.7		11 – 20	138	25.1
≥ 41	44.7 ± 2.7		≥ 21	53	9.6

Work experience (yr)	≤10	4.8 ± 2.3	**The number of nurses in each ward**	ICU	81	14.7
	11 – 20	16.0 ± 2.8		CCU	83	15.1
				Emergency	103	18.8
	≥ 21	22.9 ± 2.1		General	281	51.4

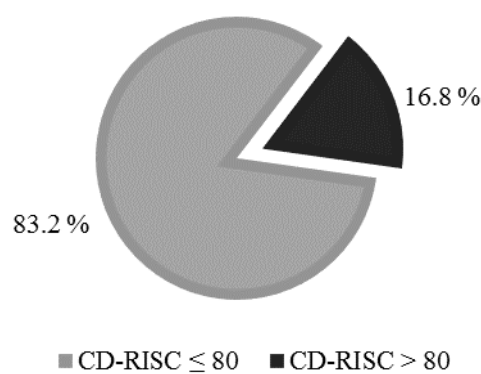| **CD-RISC and COPSOQ**					
Variable	**Classification**	**Min**	**Max**	**Mean**	**Std. deviation**
CD-RISC	Personal competence	11	31	25.1	1.8
	Trust in your own	1	27	22.9	1.8
	Accept change	8	20	17.4	2.0
	Control	0	11	6.8	1.3
	Spiritual influences	3	5	3.6	0.5
	Total	33	91	75.9	5.4
COPSOQ	Factor 1	13	36	21.8	2.9
	Factor 2	11	19	14.3	1.5
	Factor 3	9	22	17.7	2.3
	Factor 4	0	10	1.3	1.7

Fig. 1. Percentage distribution of classification of resilience levels

Fig. 1 illustrates that only 16.8% of the participants (92 nurses) reported a high level of resilience, defined as having a resilience score above 80.

Table 2 displays the average scores of resilience across various categories of demographic and occupational information. The independent t-test and one-way ANOVA examined the relationship between individual and occupational factors and resilience levels (Table 2).

The results show that males had significantly higher resilience levels than females, and unmarried individuals had significantly higher resilience levels than married individuals. Additionally, nurses with higher educational attainment displayed higher levels of resilience. Conversely, nurses with greater age and work experience exhibited lower resilience levels (Table 2).

Table 2. The resilience mean scores in different categories of demographic and occupational, and the relationship between these factors with resilience based on independent t-test and One-way ANOVA tests.

Independent t-test				
Variable	**Classification**	**CD-RISC (M±SD)**	**t**	**P-value**
Gender	Male	76.9 ± 3.9	2.679	0.008
	Female	75.5 ± 5.8		
Marital status	Single	76.7 ± 3.6	2.469	0.014
	Married	75.5 ± 6.2		
Education	Bachelor's Degree	75.7 ± 5.1	- 2.061	0.040
	Master's Degree	77.1 ± 6.5		
One way anova				
Variable	**Classification**	**CD-RISC (M±SD)**	**F**	**P-value**
Age	≤ 30	76.3 ± 4.6	4.783	0.009
	31 - 40	76.4 ± 4.3		
	≥ 41	74.7 ± 7.3		
	total	75.9 ± 5.4		
Work experience	≤ 10	76.6 ± 2.0	12.100	0.000
	11 - 20	75.3 ± 5.1		
	≥ 21	73.0 ± 10.4		
	total	75.9 ± 5.4		

Pearson's correlation test examined the association between age, nurses' work experience, workplace psychosocial factors, and the mean resilience score. The results revealed a significant negative correlation between age and work experience with resilience. Furthermore, nurses' resilience displayed a significant positive correlation with psychosocial factors 1 and 3 while showing a significant negative correlation with factors 2 and 4. The dimension of leadership quality exhibited the highest positive correlation with resilience, while the dimension of emotional demands exhibited the lowest negative correlation (Table 3).

Table 3. Correlation between age, work experience, and the psychosocial factors with mean resilience score (N=548)

Variable	r	P-value	Variable	r	P-value
Factor 1	0.457**	0.000	**Factor 3**	0.197**	0.000
Quality of leadership	0.550**	0.000	**Meaning of work**	0.125**	0.003
Social support from supervisors	0.041	0.338	**Commitment to the workplace**	0.231**	0.000
Rewards	0.183**	0.001	**Influence at work**	0.068	0.113
Justice and respect	0.020	0.647			
Trust	0.247**	0.000	**Role clarity**	0.055	0.202
Predictability	0.220**	0.000			
Factor 2	- 0.265**	0.000	**Factor 4**	- 0.349**	0.000
Self-rated health	- 0.103*	0.015	**Offensive behavior**	- 0.349**	0.000
Burnout	- 0.135**	0.002	**Demographic and Occupational**		
Stress	0.033	0.443			
Work-family conflict	0.035	0.417	**Age**	- 0.156**	0.001
Emotional demands	- 0.350**	0.000	**Work experience**	- 0.163**	0.001

* $P<0.05$ ** $P<0.01$

Table 4 displays the results of a multiple linear regression analysis investigating the influence of psychosocial factors on nurses' resilience. The data analysis revealed that all four psychosocial factors significantly affected nurses' resilience. Equation 1 represents the nurses' resilience prediction model based on psychosocial factors. According to the model, psychosocial factors can account for 31.5% of the variation in nurses' resilience levels (Adjusted $R2 = 0.315$).

Formula 1.

Resilience = $66.393 + [(0.669 \times \text{Factor 1}) - (0.607 \times \text{Factor 2}) + (0.266 \times \text{Factor 3}) - (0.754 \times \text{Factor 4})]$

Table 4. Prediction of the Resilience obtained from psychosocial factors based on multiple linear regression test (N=548)

	B	Beta	t	Sig	F	R	R^2	Adjusted R^2
(Constant)	66.393	-	19.842	0.00	-	-	-	-
Factor 1	0.669	0.361	9.760	0.00	-	-	-	-
Factor 2	- 0.607	- 0.171	- 4.496	0.00	-	-	-	-
Factor 3	0.266	0.115	3.050	0.02	-	-	-	-
Factor 4	- 0.754	- 0.249	- 6.781	0.00	-	-	-	-
Total	-	-	-	-	63.785	0.565	0.320	0.315

Discussion

The current study's aim was to predict hospital nurses' resilience based on workplace psychosocial factors.
Resilience levels among nurses showed a statistically significant negative relationship with age and work experience. Nurses with higher educational levels had higher levels of resilience. In line with the results of this study, Manomenidis et al. reported that among nurses in Greek hospitals, individuals with higher levels of education exhibited greater resilience [5]. Delgado et al. concluded that postgraduate education is a key protective strategy that may improve nurses' psychological well-being [4]. However, unlike the present study, Afshari et al. reported a positive correlation between resilience and age and the work experience of nurses [13]. In the present study, it seems that with increasing age, people may face a decrease in resilience for various reasons, such as increasing the probability of chronic physical diseases, family and children's issues and problems, and unwillingness to change. As mentioned previously, regarding the effect of education on improving resilience, a higher level of education may increase the level of knowledge and awareness of nurses. Studies have also reported that engaging in mental preparation techniques before starting a work shift can enhance resilience [5].
In the results examining, it was found that males had more resilience than females. Different studies have reported lower resilience levels in females than males

[23, 25, 26]. One of the reasons for this could be the relatively high level of emotions in females, which leads to them experiencing a higher level of stress in critical situations than males. Therefore, applying stress control skills can effectively increase resilience among women.

Single nurses had more resilience than married ones. The feeling of responsibility towards the family and the mental load caused by the increased responsibilities of married people compared to single people who have more freedom of action in life can be among the reasons that express the fact that married people show less resilience in doing their jobs.

The resilience examination in the present study showed that nurses with an average score of 75 had low resilience levels. Guo et al. reported low resilience levels in Chinese nurses, in alignment with the present study [27]. In addition, Delgado et al. found that Australian nurses had a mean score of 70.27 for workplace resilience [4]. Afshari et al. also reported a low resilience level, with an average score of 61 in their study among Iranian nurses working during the COVID-19 pandemic [23]. Although the resilience levels were low in other similar studies, nurses reported an even lower final resilience due to the increased workload, stress, and anxiety during COVID-19. In the present study, more than 16% of nurses had high resilience; however, in Afshari's study, this rate was reported as 12%, and the relatively better conditions in the present study were due to the decline of the COVID-19 pandemic.

Resilience among nurses had a statistically significant relationship with workplace psychosocial factors. Factor 1 (quality of leadership, social support from supervisors, reward, justice and respect, trust, predictability) and factor 3 (meaning of work, commitment to the workplace, influence at work, role clarity) represented a positive correlation. It showed a negative correlation with factor 2 (self-rated health, burnout, stress, work-family conflict, emotional needs) and factor 4 (offensive behavior), which indicate the negative aspects of workplace psychosocial factors. Therefore, improving positive job traits can increase resilience among nurses. Lin et al.'s study, in line with the present study, showed a significant relationship between psychosocial factors and resilience levels among Singaporean adults [28]. Moreover, Delgado et al. reported in their research among nurses that psychological well-being and workplace resilience had a strong positive correlation. So, having more resilience in the workplace increases positive adaptation [4].

Clear expectations for tasks, supervisors prioritizing nurses' job satisfaction, suitable work planning, managers' addressing nurses' work issues, showing appreciation, fair treatment in the workplace, involving nurses in decision-making and planning, providing necessary information for tasks, and resolving workplace disputes fairly are all key elements in factor

1 for improving resilience. Through transformational leadership and support, nurse leaders implement strategies to enhance job satisfaction and create a positive work environment for nurses. Consequently, nurse managers' leadership impacts organizational resilience and nurses' job engagement [29]. The influence of nurses in performing duties, giving a sense of value to the important work of care, and a clear goal in the assigned work are also among the items of factor 3 of the psychological questionnaire that can contribute to the psycho-social positive state in the work environment and enhance resilience [22, 30]. Moreover, research has shown that transformational leadership (TL) plays a significant role in reducing burnout among nurses by mediating resilience and role clarity [31]. Additionally, factors such as self-efficacy and work engagement can increase resilience. Therefore, nurses can improve their job engagement and personal satisfaction by enhancing their resilience and self-efficacy [32].

Being in uncomfortable emotional situations at work, experiencing the negative impact of work on people's private lives and energy, wasting time spent at work, health threats from work, feelings of job burnout, mental fatigue, stress, irritability, workplace threats, pressure, and bullying are among the factors (factor 2 and 4) that can with the increase of mental tensions lead to a decrease in the resilience of nurses in the work environment. Therefore, efforts should be made to reduce their negative effects as much as possible by identifying these influencing factors [22, 30]. In a study conducted by Hetzel-Riggin et al., it was found that resilience plays a partial mediating role in the relationship between work-related stress and burnout [33]. Experiencing offensive behavior in the workplace from nurses can lead to increased anxiety, decreased resilience, and, ultimately, higher levels of burnout. Therefore, improving resilience levels and promoting positive coping styles can help mitigate the negative effects of such behaviors in the workplace [34].

The highest positive correlation between resilience and quality of leadership dimensions was obtained. The lowest negative correlation was also observed between resilience level and emotional demands. Leadership is a notable factor in creating a healthy workplace that improves the recruitment and retention of nurses. Leadership quality depends on the importance given to superiors for job satisfaction and proper planning. So, it can be concluded that better supervisor planning can increase satisfaction and resilience among nurses. Being in an emotionally distressing situation due to the nature of their work can also harm the resilience of nurses.

Using multiple linear regressions, the impact of psychosocial factors on resilience among nurses showed that four psychosocial factors had statistically significant effects on resilience. These factors predicted 31.5% resilience. Thus, improving the positive

influencing factors and reducing the factors with negative psychosocial impacts in the hospital workplace increase at least one-third of resilience among nurses. Predicting the resilience level of nurses helps supervisors identify resilient people to employ them in emergency and special departments. Due to the lack of research conducted in the prediction field thus far, it is not comparable with other studies.

A meta-analysis found that resilience training improved nurses' resilience scores and was associated with stress, depression, anxiety, and burnout scores [35]. Resilience can be increased with training and practice [36]. Also, by improving workplace positive psychosocial factors, we can witness an increase in the resilience of nurses.

One of the limitations of the present study was the lack of in-person visits to the hospital due to the COVID-19 pandemic. It is suggested that data be collected in person in future studies. Also, cultural and social contexts that may affect resilience differ in different parts of the country. The present study limited access to other hospitals in the country. Therefore, it is recommended that samples from several provinces be collected and compared in future studies.

Conclusion

Based on the results, Psychosocial factors significantly impacted nurses' resilience. Psychosocial factors predicted for 31.5% of nurses' resilience. It is recommended that managers and supervisors appropriately plans to reduce negative factors such as job burnout, stress, work-family conflict, emotional demands, and offensive behavior to increase nurses' resilience. These findings can guide the implementation of psychosocial interventions to enhance nurses' resilience.

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Conflict of interest

None declared.

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Ethical Considerations

Participant information was kept confidential. All participants voluntarily participated in the study.

Ethical approval

It should be noted that this article was approved by the Research Assistant of Medical Sciences under IR.QUMS.REC.1401.328 and contract number 28.20.24074.

Authors' Contributions

Seyvan Sobhani: provided research idea, collected data and analyzed, prepared the draft original writing and editing the manuscript. The authors have read and agree to publish this manuscript. Sara Tabanfar: provided research idea, collected data and analyzed, prepared the draft original writing and editing the manuscript. The authors have read and agree to publish this manuscript. Sakineh Varmazyar: supervised data collection, analysis and verified the methodology, prepared the draft original writing and editing the manuscript. The authors have read and agree to publish this manuscript.

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