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February 2023

Master's Degree Thesis

FACTORS AFFECTING SLEEP
QUALITY OF SHIFT NURSES IN
MONGOLIA DURING THE COVID-19
PANDEMIC

Graduate School of Chosun University

Department of Nursing

Munkhtuya Altantsetseg

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COVID-19 대유행 기간 동안 몽골 교대근무 간호사의 수면의
질에 영향을 미치는 요인

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FACTORS AFFECTING SLEEP QUALITY OF SHIFT NURSES IN MONGOLIA DURING THE COVID-19 PANDEMIC

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ABSTRACT IN ENGLISH

Factors affecting sleep quality of shift nurses in Mongolia during the COVID-19 pandemic

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Purpose: During the COVID-19 pandemic, many healthcare workers experience high psychological distress, which is reported to result in poor sleep quality. Nurses who work in shifts face more significant difficulties due to their working conditions, so attention is required. This cross-sectional study aims to identify the relationship between the Fear of COVID-19, psychological distress, and sleep quality and to determine the influencing factors of sleep quality.

Methods: The subjects of this study were 204 shift nurses working in two state central tertiary hospitals in Ulaanbaatar, Mongolia. Fear of COVID-19, post-traumatic stress disorder, psychological distress and sleep quality were measured using the Fear of COVID-19 Scale (FCV-19S), Impact of Event-6 Scale (IE-6S), Depression Anxiety Stress Scale-21 (DASS-21) and the Pittsburgh sleep quality index (PSQI), respectively. The data were analyzed using descriptive statistics, t-test, ANOVA, Pearson correlation, and multiple regression analysis using SPSS 27.0 program.

Results: As a result of the analysis, 65.2% (n=133) of subjects had a PSQI score of 5 or higher, indicating poor sleep quality (Mean=7.39±3.62). Among the shift nurses, 37.3% answered that they feared COVID-19, and 12.7% had a high level of PTSD. Depression, anxiety, and stress levels of shift nurses were moderate or higher at 52.0%, 59.3%, and 35.8%, respectively. The fear of COVID-19 ($r=.28, p<.001$), PTSD ($r=.40, p<.001$), and psychological distress ($r=.45, p<.001$) were statistically significantly correlated with sleep quality. Sleep quality was associated with direct caring for COVID-19 patients and years of working experience at the current hospital. The factor affecting sleep quality was the psychological distress.

Conclusions: This study suggests that it is necessary to prepare support strategies and policies to improve the sleep quality and psychological health of shift nurses in Mongolia, which has a relatively insufficient social infrastructure in the chaotic situation of the COVID-19 pandemic. In addition, it is necessary to develop a customized intervention program to reduce psychological distress, such as depression, anxiety, and stress; and conduct follow-up studies to evaluate its effectiveness.

Keywords: Mongolia; Nurses; Psychological distress; Shift work; Sleep quality

ABSTRACT IN KOREAN

COVID-19 대유행 기간 동안 몽골 교대근무 간호사의 수면의 질에 영향을 미치는 요인

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연구 목적: COVID-19 팬데믹 동안 많은 의료 종사자들이 높은 심리적 고통을 경험하며 이로 인해 수면의 질이 저하되는 것으로 보고되었다. 교대 근무 간호사는 근무 여건상 더 큰 어려움에 처해 있으므로 주의가 필요하다. 본 서술적 조사 연구는 COVID-19에 대해 두려움, 외상 후 스트레스, 심리적 고통, 수면의 질 사이의 관계를 확인하고 수면의 질에 영향을 미치는 요인을 파악하고자 수행하였다.

연구 방법: 본 연구의 대상자는 몽골 울란바토르에 있는 두 개의 국립 3차 병원에서 근무하는 204 명의 교대 간호사이다. 자가보고식 구조화된 설문지에는 COVID-19에 대한 두려움, 외상 후 스트레스, 심리적 고통 및 수면의 질 정도를 측정하기 위한 Fear of COVID-19 Scale, Impact of Event-6 Scale, DASS-21, Pittsburgh sleep quality index 및 측정 도구가 포함되었다. 본 수집된 자료는

기술통계, t-검정, ANOVA, Pearson 상관관계, 다중회귀분석을 SPSS 27.0 프로그램을 이용하여 분석하였다.

결과: 본 연구 대상자의 65.2% (n=133)에서 수면의 질 점수가 5 점 이상으로 좋지 않은 수면의 질을 나타내었다 (평균=7.39±3.62). 교대근무 간호사 중 37.3%는 코로나 19 에 대한 두려움이 높다고 답했고, 12.7%는 높은 수준의 외상 후 스트레스 장애가 있었다. 교대근무 간호사의 중등도 이상인 경우의 우울, 불안, 스트레스 수준은 각각 52.0%, 59.3%, 35.8% 이었다. 코로나 19 에 대한 두려움 ($r=.28, p<.001$), PTSD ($r=.40, p<.001$), 심리적 고통 ($r=.45, p<.001$)은 수면의 질과 통계적으로 유의한 상관관계가 있었다. 수면의 질은 COVID-19 환자를 직접 돌보고 현재 병원에서 수년간 근무한 경험과 관련이 있습니다. 수면의 질에 영향을 미치는 요인은 심리적 고통 정도였다.

결론: 본 연구는 COVID-19 대유행이라는 혼란스러운 상황에서 사회기반시설이 상대적으로 부족한 몽골에서 교대근무 간호사의 수면의 질과 심리적 건강을 개선하기 위한 지원전략과 정책 마련이 필요함을 시사한다. 또한 우울, 불안, 스트레스 등 심리적 고통을 줄이기 위한 맞춤형 중재 프로그램을 개발하고 그 효과를 평가하기 위한 후속 연구가 필요하다.

키워드: 몽골; 간호사; 심리적 고통; 교대근무; 수면의 질

1. INTRODUCTION

1.1 Background

The World Health Organization declared the Coronavirus Disease (COVID-19) a pandemic [1]. This pandemic has caused great concern worldwide, influencing every aspect of life and tremendously impacting human health. Healthcare workers provide professional patient care despite heavy workloads and excessive hours. Owing to job demands, they experienced incomparable physical and psychological burdens. As a result of the pandemic, healthcare workers, especially nurses, were likely to develop mental and sleep problems [2]–[5].

Poor sleep quality was observed to have a high prevalence among healthcare personnel [6], nurses [7], and shift nurses [8]. During the COVID-19 pandemic, nurses suffered more often from sleep problems than doctors, and a high prevalence of poor sleep quality was detected in 87.9% of nurses [9], [10]. Furthermore, shift nurses reported greater severity of sleep disturbances [11]. A study [12] of poor sleep quality among shift and non-shift nurses showed that healthcare night shift work increased the risk of sleep disorders. Park et al. [8] revealed that poor sleep quality was significantly higher in shift nurses than in non-shift nurses. Furthermore, in China, most of them were tertiary hospital emergency nurses [13]. Additionally, poor sleep quality was associated with hospital level, workload, shift work, and other psychological factors.

Poor sleep quality is not limited by negative consequences on a person's quality of life. Moreover, it affects medical errors, intent to leave sickness, turnover rate, and even patient dissatisfaction [14]–[16]. Nurses generally spend extended hours on patient care and are in close contact with COVID-19 patients. They were overwhelmed by their fear during the pandemic. Most nurses reported fear of being infected with COVID-19 and carrying the virus

to family members [17], [18]. Numerous studies [19]–[22] have found that the prevalence of fear of COVID-19 was 53.5% among nurses. At the same time, they face various psychological complications. Previous studies [9] have demonstrated that post-traumatic stress disorder (PTSD) and psychological distress may worsen following the COVID-19 pandemic. Mild-to-severe PTSD symptoms were detected in up to 53.8% of healthcare personnel [23] and up to 73.3% of nurses [24]. Furthermore, a study by Ching et al. [25] revealed that nurses suffered from psychological distress, such as depression (55.3%), anxiety (69.6%), and stress (20.5%).

During the COVID-19 pandemic, the demand for Mongolian healthcare services far exceeded human resources. Healthcare workers still experience longer working hours and more than usual workloads and are concerned about their health and well-being. The COVID-19 pandemic has had multiple mental and psychological side effects, such as depression, anxiety, and stress among Mongolian nursing professionals. Many nursing professionals exhibit the signs and symptoms of mental health disorders [26]. In a study by Otgonbaatar et al. [27], 65.3% of 473 nurses working in tertiary hospitals in Mongolia during the COVID-19 pandemic reported high work-related stress levels. Furthermore, nurses reported experiencing moderate-to-severe levels of depression (36.5 %), anxiety (64.6 %), and stress (23.2 %) [26]. Compared to staff physicians, Mongolian nurses were significantly more likely to experience moderate-to-severe depression, anxiety, and stress.

At the peak of the COVID-19 pandemic, nurses reported that they suffered, which required them to work more than eight hours a day due to shift work. Night-shift nurses work 16–24 hours in every shift, and the average annual working hours are more than 4-16 hours if compared with other countries [26], [27]. A study by Tsogbadrakh et al. [26] on the level of mental health among healthcare workers in Mongolia during the COVID-19 pandemic found that 67.0% of 494 nurses had insomnia. Sleep disorders, such as insomnia, increase susceptibility to depression, anxiety, and stress–2-3 times or more. Mongolian nurses are relatively young and have never experienced a sudden and rapid increase in the number of

COVID-19-infected patients who need intensive care, which is why it was found that psychological distress was more significant.

Previous studies have shown that the prevalence of PTSD symptoms and psychological distress levels among the nurse population is higher among healthcare personnel. Shift nurses are prone to sleep disorders and poor sleep quality. Numerous studies [11], [15], [28]–[30] have revealed that many factors can account for poor sleep quality among nurses. For instance, fear of COVID-19, PTSD, and psychological distress such as depression, anxiety, and stress were found to be significantly associated with poor sleep quality. The findings revealed that poor sleep quality is strongly linked to physical and psychological complications among nurses. As such, determining the factors affecting sleep quality is essential for improving quality of life. However, sleep quality and its affecting factors still need to be discovered among Mongolian shift nurses. Based on these findings, we aimed to explore the factors affecting the sleep quality of shift nurses in Mongolia and provide primary data for improving sleep quality.

1.2 Purpose

This study aimed to determine the factors affecting sleep quality in shift nurses working at state central tertiary hospitals in Mongolia during the COVID-19 pandemic. The precise purpose of this study is as below:

- 1) To identify the general characteristics, level of fear of COVID-19, post-traumatic stress disorder, psychological distress, and sleep quality, respectively.
- 2) To identify the differences between fear of COVID-19, post-traumatic stress disorder, psychological distress, and sleep quality according to the general characteristics.
- 3) To identify the relationship between fear of COVID-19, post-traumatic stress disorder, psychological distress, and sleep quality.
- 4) To investigate factors affecting sleep quality.

1.3 Definition of terms

1.3.1 Fear of COVID-19

- a) Theoretical definition: One psychological aspect of the COVID-19 pandemic is fear. It is defined unpleasant emotional state triggered by the perception of threatening stimuli [31].
- b) Operational definition: In this study, the fear of COVID-19 level was measured using the Fear of COVID-19 Scale (FCV-19S) [32], developed by Daniel Kwasi Ahorsu et al. The score was measured by translated version Mongolian with verified through content validity verification.

1.3.2 Post-traumatic stress disorder

- a) Theoretical definition: Post-traumatic stress disorder is a syndrome in which various symptoms occur after an individual see, hears, or experiences a severely traumatic event. It refers to the destructive effect of function [33].
- b) Operational definition: In this study, post-traumatic stress disorder was measured by the Impact of Event Scale-6 (IES-6) [34], developed by Siri Thoresen et al. The score was measured by translated version Mongolian with verified through content validity verification.

1.3.3 Psychological distress

- a) Theoretical definition: Psychological distress is a set of painful physical and mental symptoms related to regular mood changes for most people. Psychological distress

may indicate the onset of a major depressive disorder, anxiety disorder, or stress disorder [35].

- b) Operational definition: In this study, the level of psychological distress was measured by the Depression Anxiety Stress Scales-21 (DASS-21) [36], developed by Julie D. Henry et al. The score was measured by translated version Mongolian with verified through content validity verification.

1.3.4 Sleep Quality

- a) Theoretical definition: Sleep quality refers to the subjective state of the overall feeling of sleep-induced relaxation, depth of sleep, and sleep satisfaction [37].
- b) Operational definition: In this study, sleep quality was measured by the Pittsburgh Sleep Quality Index (PSQI) [37], developed by Daniel J. Buysse et al. The score was measured by translated version Mongolian with verified through content validity verification.

2. LITERATURE REVIEW

2.1 Fear of Covid-19

Fear of COVID-19 (FCV-19) is much greater than the fear of seasonal influenza and is likely driven by uncertainties surrounding its novel and unique features [38], [39]. Fear of COVID-19 can slowly creep into people's minds, with consequences that have not yet been fully understood [40]. Fear (43.7%) was the second most frequent mental health issue among healthcare personnel during the previous pandemic of severe acute respiratory syndrome (SARS) [41]. Most healthcare personnel have been overwhelmed by fear during the COVID-19 pandemic [42]. Previous studies have reported the level of FCV-19 among healthcare personnel at up to 91.6% [43]. The most recent systematic review and meta-analysis revealed that more than two-thirds of healthcare personnel suffered from FCV-19, ranging between 71.3% [25] to 77.1% [44] in Asia.

The previous studies found the level of FCV-19 is significantly different among medical and administrative personnel (70.6% vs 58.4%) [45] and between females and males (19.8±6.8 vs 18.7±7.2) [46]. In general, nurses spend longer in direct patient care and close contact with COVID-19 patients, and they face a range of emotions while caring for COVID-19 patients. Furthermore, the risk of contracting COVID-19 was 2.7 times higher for nurses compared to physicians [47]. As a result, they experienced higher levels of fear associated with this disease compared with other healthcare personnel, up to 53.5% as reported in some studies [21], [22].

There are multiple reasons behind the fear of COVID-19. The most commonly reported fears among nurses were being infected [17], carrying the virus home and infecting family members [18], healthcare institutions becoming overcapacity [48], and lack of Personal

Protection Equipment (PPE) [24], [49], [50]. The potential for infecting others was a significant concern among nurses and other healthcare personnel. Some nurses have even reported sleeping in their cars or hotel rooms to protect their families and prevent spread of infection [51]. The fear of infecting their own family members has been reported to be between 68.2% [52] to 94.2% [17]. The fear of COVID-19 infection can result in physical-cognitive fatigue and can potentially have adverse effects on physical and mental health. Most nurses highlighted that the way their work was organized was not conducive to rest and breaks between shifts [20]. Additionally, a study by Maryam et al. [53] revealed that healthcare personnel, after experiencing the infection of COVID-19, their perception of the profession and providing care had changed.

Mental health issues among nurses deserves more attention and dedicated research. Many nurses hide their feelings from family members and worry about sharing their feelings with their co-workers. They may hide or mask their emotions. Hence, nurse leaders should monitor and support their nurses for signs of complicated grief, such as anxiety, depressive symptoms, and post-traumatic stress disorder [51]. The importance of self-care activities to improve psychological well-being has been identified in numerous studies [51], [54], [55] of nurses working during the pandemic.

2.2 Post-Traumatic Stress Disorder

Post-traumatic stress disorder (PTSD) is a psychiatric disease caused by exposure to traumatic events. It is the most common post-traumatic psychological reaction [56]. It leads to symptoms of exaggerated startle response, difficulty concentrating or remembering, disturbed sleep, and an emotional condition that sometimes creates intense feelings of fear, helplessness, or horror [57], [58]. Approximately 10 percent of women and 5 percent of men experience

PTSD during their lifetime. The risk of developing PTSD varies substantially by the type of trauma [59].

Around the world, healthcare workers are more prone to be exposed to various psychological problems [60]. The impact of the novel COVID-19 pandemic on mental health has affected every segment of society [61]. Many countries lost their healthcare workers not only to COVID-19 but also to the subsequent PTSD as a result of this tragedy [28], [62], [63]. Hence, the COVID-19 pandemic has underscored the crucial need to focus on its impact on the mental health of healthcare personnel [64].

A review of PTSD symptoms during the three coronavirus outbreaks, including the current COVID-19 pandemic, reveals significant mental health issues ranging from mild to severe PTSD. These symptoms were reported to be as high as 71.5% among healthcare personnel [24], [28], [64]. During the early stage of COVID-19, a study by Lasalvia et al. [23] found that PTSD was reported in 53.8% of healthcare personnel in Italy. At the same time, in China, a study by Si et al. [65] found that 40.2% of healthcare workers met the clinical criteria for PTSD. The use of various measurement tools to evaluate PTSD among participants has contributed to the wide range of prevalence rates reported in previous studies. Nevertheless, healthcare personnel and nurses are at high risk of experiencing mental health issues [39], particularly nurses who are directly caring for patients infected with the COVID-19 virus.

Among all healthcare workers, multiple studies have explored that nurses are at an elevated risk for PTSD [66], and 94% have reported experiencing at least one symptom of PTSD [67]. Mild to severe PTSD symptoms were reported by up to 43.7% of nurses in previous pandemics [68]. During the COVID-19 pandemic, nurses were dealing with heavy physical and mental burdens. Nurses had twice the likelihood of developing PTSD symptoms, and mild to severe symptoms were detected in up to 73.3% [24].

The prevalence of PTSD was related to gender [69], length of service, average monthly income [70], irregular work shifts, hospital department [71], occupational role, and

lack of social support [69]. In the context of the hospital department, numerous studies revealed that intensive care unit (ICU) and emergency department nurses experienced more PTSD symptoms when compared with nurses of other units [67]. Mealer et al. [72], [73] reported that ICU nurses (29%) had experienced more PTSD symptoms when compared with other general nurses (14%). Many healthcare workers tend not to seek help [74], and PTSD symptoms can become long-term [39]. Untreated PTSD can result in symptoms up to ten years following the traumatic event [74]. These untreated symptoms may even lead to medical problems such as sleep difficulties [59]. PTSD is a worldwide professional concern for nurses [67]. Therefore, attention should be given to the prevalence of PTSD symptoms among nurses. As such, there is a necessity to determine psychological well-being and evaluate for PTSD symptoms among Mongolian shift nurses.

2.3 Psychological Distress

Emergencies, such as pandemics, give rise to anxiety and other negative emotions [75]. At the beginning of the SARS outbreak in 2003, multiple mental disorders emerged, including persistent depression, anxiety, and stress at rates of 37%, 46%, and 41% [41], [76], respectively. As a result of the current COVID-19 pandemic, healthcare personnel have been profoundly impacted and many have experienced mental health issues [77]. For instance, a study among healthcare personnel reported that 38.7% of the participants declined in psychological well-being [78]. Previous review studies [68], [79], [80] reported the prevalence of depression at 37%, anxiety at 41%, and stress at 37%, among healthcare personnel. Furthermore, the Ching et al. [25] study revealed one-third of healthcare personnel suffered from depression (37.5%), anxiety (39.7%), and stress (36.4%) during the COVID-19 pandemic in Asia.

Nurses are considered a group at high risk of developing occupational mental health problems [81] and are often physically and psychologically distressed [82] by the nature of their work. Thus, they are more likely to experience depression [25], anxiety [65], and stress [60] when compared to other healthcare personnel. Nurses also suffered more often from psychological symptoms such as anxiety and depression than doctors [9]. Additionally, a study by Zakeri et al. [83] found that nurses' depression, anxiety, and stress scores significantly increased during the first wave of the COVID-19 pandemic compared with before the outbreak of this disease. Numerous previous studies [84], [85] have reported rates of mental health issues among nurses, such as depression (55.3%), anxiety (69.6%), and stress (20.5%).

Researchers recently found that nurses were at more than double the risk of developing mental health issues [60], and many participants (33.4%) reported more than four psychological symptoms [86]. A significant number of nurses working at night also experienced physiological consequences (93.6%) [87]. Moreover, night shift nurses reported higher levels of depression, anxiety, and stress [88].

Another study by Meredith et al. [73] reported that nurses with higher levels of perseverance were 11% more likely to experience PTSD, ICU nurses with children were 40% less likely, and each year of experience decreased the chance to experience PTSD by 3%. Among healthcare personnel, significant risk factors associated with increased incidence of psychological distress included young age [80], hospital department, and occupational role [89]. Among nurses, shift work [90], fewer years of experience [69], marital status [91], and female gender [92] were associated with increased incidence of PTSD. During the COVID-19 pandemic, multiple studies [93]–[95] reported that female nurses had higher incidences of psychological distress, such as depression, anxiety, and stress. Furthermore, psychological distress is significantly associated with and can lead to shift work disorder [96], irregular menstrual cycles [97], gastrointestinal symptoms [98], increased risk of cardiovascular disease [97], [99], decreased cognitive performance [100], and sick leave [96].

According to nurses, psychologically distressing experiences significantly impact quality of care [101] and healthcare personnel safety [44]. Mental distress can potentially lead to a change of behavior, negatively affect a person's emotions, and affect their relationships with those around them. Therefore, attention should be paid to the prevalence of psychological distress such as depression, anxiety, and stress among nurses. Although there is a certain amount of research conducted among Mongolian nurses, there is still not enough research on the relationship between shift nurses' psychological distress and sleep quality. Hence, we aimed to study the prevalence of psychological distress such as depression, anxiety, and stress among Mongolian nurses.

2.4 Sleep Quality

The sleep quality of healthcare personnel is a growing concern worldwide. Sleep disturbance can lead to on daytime dysfunction, medical errors, increased rates of sick leave usage and turnover rate, and patient dissatisfaction [14]–[16]. Poor sleep quality was reported at high prevalence rates among healthcare personnel [6], [30]. A study by Wang et al. [102] reported that Pittsburgh Sleep Quality Index (PSQI) scores were (7.22 ± 2.62) higher among healthcare personnel. Those with poor sleep quality may have difficulty attending to their activities of daily living, which, in turn, may affect their quality of life [11].

Nurses have been reported to suffer more often from sleep problems than doctors and experience a greater severity of sleep disorders [9]. In a recent study [7] among nurses, 64.8% reported poor sleep quality. Furthermore, numerous studies [11], [103] reported that shift nurses experienced a greater severity of sleep disturbance. A study by Park et al. [8] measured sleep quality via the PSQI, and shift nurses (7.1 ± 1.8) had significantly higher reported scores

than non-shift nurses (4.4 ± 1.8) during the pandemic. Additionally, ICU nurses have also been reported to have substantially higher levels of poor sleep quality than other unit nurses [30].

Previous studies have revealed that many factors may contribute to the poor sleep quality among nurses. These may include the female gender, psychological distress such as fear of COVID-19, depression, anxiety, and stress, and other job-related factors such as excessive workloads [11], [15], [29], [30]. Researchers also reported an increased rate of adverse events as a result of sleep-related problems, such as sleep quality, among shift nurses [104]. For instance, a study by Simone et al. [10] reported that among nurses with poor sleep quality (PSQI score ≥ 5), the rate of medication errors during the last shift was as high as 76%.

Multiple studies have also demonstrated that poor sleep quality can result in various adverse consequences [13]. Poor sleep quality is associated with a higher incidence of PTSD [28]. Subjective health status and shift work related stress were essential factors influencing the level of sleep disturbance [105]. Furthermore, a study by Booker et al. [96] has explored evidence that sleep disorders caused by shift work are an essential risk factor for mental health issues. Night shift work has been shown to be associated with abnormal eating patterns [106], obesity [8], and low confidence levels [107].

Night shift nurses have been shown to have poorer sleep quality. One study showed that during the pre-pandemic period, the mean PSQI score was 5.56 among day shift nurses and 7.08 among night shift nurses [108]. Another study by Watanabe et al. [109] demonstrated that night shift nurses who were allowed a nap of ≥ 90 minutes reported less fatigue at the end of the shift. Even so, a significant number of nurses have reported inadequate break time during work hours, not enough rest between shifts, and the inability to nap while on night shift [20].

As a result of the global COVID-19 pandemic, healthcare workers were under a tremendous psychological burden which significantly impacted their sleep quality [110]. Poor sleep quality leads to adverse health outcomes and affects mental well-being. Therefore, attention should be paid to sleep quality and its determinants. Although there is some research

conducted among Mongolian nurses, there is still not enough research on the relationship between shift nurses' sleep quality and between PTSD and psychological distress. Hence, we aimed to study the factors affecting the sleep quality of shift nurses in Mongolia during the COVID-19 pandemic.

3. METHODS

3.1 Design

This study is a cross-sectional descriptive research study to identify the level of sleep quality and the factors affecting it among shift nurses in Mongolia.

3.2 Subject

The study involved shift nurses from two state central tertiary hospitals in Mongolia. The survey questionnaire was collected from nurses who voluntarily agreed to participate and understood the purpose of this study. The convenience sampling method was used to consider the ease of data collection. The sample size was calculated using the G*Power 3.1 program. A statistical significance level was set at $\alpha=0.05$, a medium effect size of 0.15, and a statistical power ($1-\beta$) of 0.90 to identify factors influencing sleep quality with a linear multiple regression model [111]. The appropriate number of subjects was calculated as 171 when considering the dropout rate of 30%. The total sampling size was defined and finalized by 222 participants. Eighteen participants' data were excluded due to insufficient responses, and 204 participants' data were finally analyzed.

3.2.1 Sampling inclusion criteria

- The nurse who works with a shift schedule
- The nurse who has work experience more than six months

3.2.2 Sampling exclusion criteria

- The nurse who is under treatment for a sleep disorder
- The nurse who does not want to participate voluntarily in the study

3.3 Measurement instrument

The study conducted a self-administered survey questionnaire among shift nurses, which included general characteristics, fear of COVID-19, post-traumatic stress disorder, psychological distress, and sleep quality.

3.3.1 General characteristics

The participants' general characteristics questionnaire was created following the literature review. The questionnaire to collect this information included 16 items. The questionnaire was used to obtain general information related to education level, working department, whether direct caring for COVID-19 patients, years of working experience, years of working experience at the current hospital, and worked hours in the past month, age, gender, place of residence, number of household members, number of children, the distance between work and home, family income, whether smoking or alcohol drinking and any treatment for a sleep disorder questions.

3.3.2 Fear of COVID-19

In this study, the fear of COVID-19 level was measured by the Fear of COVID-19 Scale (FCV-19S) [32], developed by Daniel Kwasi Ahorsu et al. It can be relied upon to assess and deal with the psychological issues emanating from COVID-19 among males, females, and

individuals of all ages. This instrument maintained five points Likert scale with seven items, which are "strongly disagree" (item score 1), "disagree" (score 2), "neither agree nor disagree" (score 3), "agree" (score 4), or "strongly agree" (score, 5). The evaluated total score was classified by normal (7-22) and severe (23-35) levels of fear from COVID-19. The higher scores indicate a more severe symptom. Cronbach's alpha was (.82), indicating a high degree of internal consistency at the time of the development of this tool [32]. In the current study, the FCV-19S instrument had a satisfactory score of internal consistency reliability of Cronbach's alpha equal to 0.90. The content validity verification result showed an acceptable score of .86.

The FCV-19S measurement tool was translated into Mongolian. The translation process followed the Translation and adaptation of instruments WHO guidelines [112]. The content validity index was used to verify translated version questionnaires [113]. In this process, four organizations' six experts (nursing professors) have participated. They were from National Central Hospital, Mongolian National Medical University, and Private University.

3.3.3 Post-traumatic stress disorder

In this study, post-traumatic stress disorder level was measured by the Impact of Event Scale-6 (IES-6) [34], developed by S. Thoresen et al. The IES-6 performs well as a brief measure of post-traumatic stress reactions in clinical and non-clinical populations. This instrument maintained five points Likert scale with six items, which is "not at all" (item score 0), "a little bit" (score, 1), "moderately" (score, 2), "quite a bit" (score, 3), or "extremely" (score, 4). The evaluated total score was classified by normal (0-13) and severe (14-24) levels of post-traumatic stress disorder. The higher scores indicate a more severe post-traumatic stress disorder reaction. Cronbach's alpha was (.80), indicating a high degree of internal consistency at the time of the development of this tool [34]. In the current study, the IES-6 instrument had a satisfactory score of internal consistency reliability of Cronbach's alpha equal to 0.92. The content validity verification result showed an acceptable score of .83.

The IES-6 measurement tool was translated into Mongolian. The translation process followed the Translation and adaptation of instruments WHO guidelines [112]. The content validity index was used to verify translated version questionnaires [113]. In this process, four organizations' six experts (nursing professors) have participated. They were from National Central Hospital, Mongolian National Medical University, and Private University.

3.3.4 Psychological distress

Psychological distress in this study was measured by the Depression Anxiety Stress Scale-21 (DASS-21) [36], developed by J. D. Henry et al. It is an independent measure of psychological distress and a validated screening instrument for patients and general populations. The instrument maintained four points Likert scale with twenty-one items, which is "did not apply to me at all" (item score 0), "applied to me some degree, of some of the time" (score 1), "applied to me to a considerable degree, or a good part of the time" (score 2), or "applied to me very much, or most of the time" (score 3). The evaluated total score was classified by normal (0-15), moderate (16-29), and severe (30-63) levels of psychological distress. The higher scores indicate a more severe symptom. Cronbach's alpha was (.93), indicating a high degree of internal consistency at the time of the development of this tool [36]. In the current study, the DASS-21 instrument had a satisfactory score of internal consistency reliability of Cronbach's alpha equal to .97.

The Mongolian version of the DASS-21 measurement tool was used from the public domain website DASS-21 [114].

3.3.5 Sleep Quality

In this study, sleep quality was measured by the Pittsburgh Sleep Quality Index (PSQI) [37], developed by Buysse et al. It is a self-reported questionnaire that evaluates subjective sleep quality and different aspects of sleep over a 1-month interval. The questions assess

factors relating to sleep quality, including estimates of sleep duration and latency and frequency and severity of specific sleep-related problems. This instrument maintained 19 items. All items are grouped into seven component scores, each weighted equally on a 0-3 scale. The seven component scores are then summed to yield a global PSQI score. The evaluated global PSQI total score was classified by good (0-4) and poor (5-21) sleep quality. The higher scores indicate worse sleep quality. Cronbach's alpha was (.83), indicating a high degree of internal consistency at the time of the development of this tool [37]. In the current study, the PSQI had a satisfactory score of internal consistency reliability of Cronbach's alpha equal to 0.82. The content validity verification result showed an acceptable score of .96.

The PSQI measurement tool was translated into Mongolian. The translation process followed the Translation and adaptation of instruments WHO guidelines [112]. The content validity index was used to verify translated version questionnaires [113]. In this process, four organizations' six experts (nursing professors) have participated. They were from National Central Hospital, Mongolian National Medical University, and Private University.

3.4 Data collection and ethical consideration

Necessary consent was obtained by contacting Director of Nursing in advance to conduct this study. The principal investigator was not able to personally collect the survey from the respondents. Accordingly, a researcher was commissioned in Mongolia, and online education related to this research was conducted. A trained researcher presented the study to nurses at a nurse meeting at two hospitals. Consent was obtained from nurses who voluntarily agreed to participate in the study. The survey was conducted for seven days, from September to October 2022. The survey took approximately 10-15 minutes. The completed survey was placed in a sealed envelope to maintain confidentiality. After seven days, the researcher went to

each hospital and collected the research materials. There were no hypothesized adverse effects, harms, or risks to study participants.

3.5 Data analysis method

The coded data were analyzed using IBM SPSS 27.0 program. The precise analysis method of this study is as below:

- 1) The descriptive statistical analysis was performed with frequency, percentage, and standard deviation of the mean to determine the general characteristics, fear of COVID-19, post-traumatic stress disorder, psychological distress, and sleep quality.
- 2) According to the general characteristics, the differences between fear of COVID-19, post-traumatic stress disorder, psychological distress, and sleep quality were analyzed by Independent t-test and ANOVA. The Scheffé test for multiple comparisons was used to identify post-hoc significance differences.
- 3) Pearson's Correlation Coefficient test was performed to determine the relationship between fear-of COVID-19, post-traumatic stress disorder, psychological distress, and sleep quality.
- 4) Multiple regression analysis was used to determine the predicting factors for sleep quality.

4. RESULTS

4.1 General characteristics

A total of 204 shift nurses participated in this study. The bachelor's degree was 72.1% (147) at the education level. The participants were in the following units: specialty unit 50.0% (102), inpatient department 43.1% (88), and outpatient department 6.9% (14). Most participants, 64.7% (132), were detected direct caring for COVID-19 patients. The clinical working experience average was 13.39 ± 10.07 years. The average working experience at the current hospital was 11.74 ± 8.91 years. Of the participants' 18.2% (37) were detected working more than 50 hours a week in the past month.

Among participants, the average age was 37.21 ± 10.0 years, and 92.2% (188) were female. The participants were in the following place of residence: apartments 46.6% (95), houses 28.9% (59), yurts 13.2% (27), and others 11.3% (23). The majority, 53.4% (109) of participants, were detected spending time to reach their home more than one hour from work. The participants' household member average was 3.84 ± 1.42 , and the number of children average was 1.30 ± 1.23 , respectively. The family income average was $1,605 \pm 732$ mnt. Most participants, 92.6% (189) and 91.2% (186) were answering for did not smoke and did not drink alcohol, respectively [Table 1].

[Table 1] General characteristics

(N=204)

Category	Item	n(%)	M±SD	Min ~ Max
Education level (degree)	Diploma	42(20.6)		
	Bachelor	147(72.1)		
	Master's and above	15(7.3)		
Working department	Outpatient ward	14(6.9)		
	Inpatient ward	88(43.1)		
	Specialty unit*	102(50.0)		
Direct caring for COVID-19 patients	Yes	132(64.7)		
	No	72(35.3)		
Year of working experience	≤9	96(47.0)	13.39±10.07	1.0 ~ 38.0
	10-19	54(26.5)		
	≥20	54(26.5)		
Year of working experience at the current hospital	≤9	108(52.9)	11.74±8.91	1.0 ~ 36.7
	10-19	55(27.0)		
	≥20	41(20.1)		
Worked hours in the past month (hours/week)	≤40	119(58.3)		
	41-50	48(23.5)		
	≥51	37(18.2)		
Age (years)	22-29	55(27.0)	37.21±10.0	22 ~ 57
	30-39	60(29.4)		
	40-49	63(30.9)		
	≥50	26(12.7)		
Gender	Female	188(92.2)		
	Male	16(7.8)		
Place of residence	Yurt	27(13.2)		
	House	59(28.9)		
	Apartment	95(46.6)		
	Other*	23(11.3)		

Distance between home and work (minutes)	<30	25(12.3)		
	30-59	70(34.3)		
	≥60	109(53.4)		
Household member	Living alone	12(5.9)	3.84±1.42	1 ~ 8
	Not living alone	192(94.1)		
Number of children	No child	70(34.3)	1.30±1.23	0 ~ 5
	≥1 child	134(65.7)		
Family income (MNT)**	<1,500	82(40.2)	1,605±732	600 ~ 7,850
	≥1,500	119(58.3)		
	Not answered	3(1.5)		
Smoking	Yes	15(7.4)		
	No	189(92.6)		
Alcohol use	Yes	18(8.8)		
	No	186(91.2)		

M: Mean; SD: Standard deviation

*Specialty unit: including Emergency room, Intensive care unit and Operation room

**MNT: Mongolian Tugrug (1,500 MNT = 448.69 USD)

4.2 The level of fear of COVID-19, post-traumatic stress disorder, psychological distress and sleep quality

The fear of COVID-19, post-traumatic stress disorder, psychological distress, and sleep quality were measured by four kinds of measurement tools with continuous variables.

Fear of COVID-19 average score was measured at 19.77 ± 6.64 . As a result, 37.3% (76) of the shift nurses were identified with severe fear of COVID-19. The post-traumatic stress disorder average score was measured at 7.50 ± 5.22 . In the surveys, 12.7% (26) of the respondents were detected with a significant post-traumatic stress disorder. The level of psychological distress was evaluated by DASS-21 instrument, it included level of depression, anxiety, and stress levels. The prevalence of having moderate to severe levels of depression, anxiety, and stress was 52% (106), 59.3% (121), and 35.8% (73) amongst shift nurses. The total psychological distress average score was measured at 17.65 ± 14.39 . Moderate to severe levels of psychological distress were measured at 51.5% (105) prevalence.

The sleep quality average score was measured at 7.39 ± 3.62 . Among 204 participants in this study, 65.2% (133) participants were detected with poor sleep quality [Table 2].

[Table 2] The level of fear of COVID-19, post-traumatic stress disorder, psychological distress and sleep quality

(N=204)

Variable		n(%)	M±SD	Min ~ Max
Fear of COVID-19			19.77±6.64	7 ~ 35
	Normal (7-22)	128(62.7)		
	Severe (23-35)	76(37.3)		
Post-traumatic stress disorder			7.50±5.22	0 ~ 23
	Normal (0-13)	178(87.3)		
	Severe (14-24)	26(12.7)		
Psychological distress				
Depression			5.34±4.84	0 ~ 21
	Normal (0-4)	98(48.0)		
	Moderate (5-9)	69(33.8)		
	Severe (10-21)	37(18.2)		
Anxiety			5.94±5.08	0 ~ 21
	Normal (0-3)	83(40.7)		
	Moderate (4-7)	53(26.0)		
	Severe (8-21)	68(33.3)		
Stress			6.37±5.01	0 ~ 21
	Normal (0-7)	131(64.2)		
	Moderate (8-12)	48(23.5)		
	Severe (13-21)	25(12.3)		
Total score of DASS-21*			17.65±14.39	0 ~ 63
	Normal (0-15)	99(48.5)		
	Moderate (16-29)	66(32.4)		
	Severe (30-63)	39(19.1)		
Sleep Quality			7.39±3.62	0 ~ 19
	Good (0-4)	71(34.8)		
	Poor (5-19)	133(65.2)		

M: Mean; SD: Standard deviation

*Total score of DASS-21: depression, anxiety, and stress total score measured by DASS-21 instrument

4.3 The level of fear of COVID-19 according to the general characteristics

Among the participants, the fear of COVID-19 was measured according to the general characteristics. In the analysis of the Independent t-test, the fear of COVID-19 level was detected as statistically significant with direct caring for COVID-19 patients ($t=2.49, p=.013$). As a result of the ANOVA test, the fear of COVID-19 has identified statistically significant differences in the distance between home to work ($F=5.72, p=.004$).

In the analysis of the Scheffé test, on-duty shift nurses with direct caring for COVID-19 patients was evaluated with more fear than shift nurses who do not care directly for COVID-19 patients. The shift nurses who take a long time from home to work was evaluated with higher levels of fear than nurses who take less time [Table 3].

[Table 3] The level of fear of COVID-19 according to the general characteristics

(N=204)

Category	Item	n(%)	Fear of COVID-19		
			M±SD	t/F	(p) Scheffé test
Education level (degree)	Diploma	42(20.6)	20.12±6.97	.08	.926
	Bachelor	147(72.1)	19.67±6.71		
	Master's and above	15(7.4)	19.87±5.20		
Working department	Outpatient ward	14(6.9)	18.07±7.61	1.15	.319
	Inpatient ward	88(43.1)	19.31±6.35		
	Specialty unit*	102(50.0)	20.41±6.73		
Direct caring for COVID-19 patients	Yes	132(64.7)	20.62±6.46	2.49	.013
	No	72(35.3)	18.22±6.73		
Year of working experience	≤9	96(47.0)	20.20±6.37	1.72	.182
	10-19	54(26.5)	20.44±7.21		
	≥20	54(26.5)	18.35±6.43		
Year of working experience at the current hospital	≤9	108(52.9)	20.13±6.48	1.56	.213
	10-19	55(27.0)	20.29±6.97		
	≥20	41(20.1)	18.15±6.51		
Worked hours in the past month (hours/week)	≤40	119(58.3)	19.77±6.73	.84	.435
	41-50	48(23.5)	18.96±6.98		
	≥51	37(18.2)	20.84±5.85		
Age (years)	22-29	55(27.0)	19.93±6.47	1.61	.188
	30-39	60(29.4)	20.12±6.83		
	40-49	63(30.9)	20.40±6.29		
	≥50	26(12.7)	17.15±7.13		
Gender	Female	188(92.2)	19.89±6.80	.88	.381
	Male	16(7.8)	18.38±4.24		
Place of residence	Yurt	27(13.2)	19.63±7.66	.89	.447
	House	59(28.9)	20.61±6.13		
	Apartment	95(46.6)	19.04±6.64		
	Other	23(11.3)	20.83±6.69		

Distance between home and work (minutes)	<30 ^a	25(12.3)	16.64±7.17	5.72	.004
	30-59 ^b	70(34.3)	18.89±6.12		(a<b<c)
	≥60 ^c	109(53.4)	21.06±6.56		
Household member	Living alone	12(5.9)	18.83±6.91	-.51	.614
	Not living alone	192(94.1)	19.83±6.64		
Number of children	No child	70(34.3)	19.75±7.02	.08	.933
	≥1 child	134(65.7)	19.83±5.89		
Family income (MNT)**	<1,500	82(40.2)	20.26±6.63	1.23	.219
	≥1,500	119(58.3)	19.09±6.64		
Smoking	Yes	15(7.4)	18.53±7.19	-.75	.454
	No	189(92.6)	19.87±6.60		
Alcohol use	Yes	18(8.8)	19.22±6.43	-.37	.713
	No	186(91.2)	19.83±6.67		

M: Mean; SD: Standard deviation

*Specialty unit: including Emergency room, Intensive care unit and Operation room

**MNT: Mongolian Tugrug (1,500 MNT = 448.69 USD)

4.4 The level of post-traumatic stress disorder according to the general characteristics

The level of post-traumatic stress disorder was measured by Independent t-test and ANOVA test. However, the level of post-traumatic stress disorder in this study, no significant difference was found according to the general characteristics [Table 4].

[Table 4] The level of post-traumatic stress disorder according to the general characteristics

(N=204)

Category	Item	n(%)	Post-traumatic stress disorder		
			M±SD	t/F	(p)
Education level (degree)	Diploma	42(20.6)	6.33±5.27	1.55	.215
	Bachelor	147(72.1)	7.71±5.32		
	Master's and above	15(7.4)	8.67±3.49		
Working department	Outpatient ward	14(6.9)	6.57±5.61	.49	.616
	Inpatient ward	88(43.1)	7.27±5.23		
	Specialty unit*	102(50.0)	7.80±5.18		
Direct caring for COVID-19 patients	Yes	132(64.7)	7.99±5.07	1.85	.065
	No	72(35.3)	6.58±5.39		
Year of working experience	≤9	96(47.0)	8.10±5.22	1.93	.149
	10-19	54(26.5)	7.54±5.38		
	≥20	54(26.5)	6.37±4.95		
Year of working experience at the current hospital	≤9	108(52.9)	7.93±5.24	2.35	.098
	10-19	55(27.0)	7.82±5.59		
	≥20	41(20.1)	5.93±4.40		
Worked hours in the past month (hours/week)	≤40	119(58.3)	7.47±5.20	.02	.980
	41-50	48(23.5)	7.44±5.55		
	≥51	37(18.2)	7.65±4.95		
Age (years)	22-29	55(27.0)	8.27±5.35	1.41	.242
	30-39	60(29.4)	7.48±5.18		
	40-49	63(30.9)	7.56±4.74		
	≥50	26(12.7)	5.73±5.97		
Gender	Female	188(92.2)	7.53±5.24	.29	.769
	Male	16(7.8)	7.13±5.10		
Place of residence	Yurt	27(13.2)	6.44±5.30	1.05	.374
	House	59(28.9)	8.27±5.57		
	Apartment	95(46.6)	7.16±4.91		
	Other	23(11.3)	8.13±5.43		

Distance between home and work (minutes)	<30	25(12.3)	6.20±4.69	2.48	.087
	30-59	70(34.3)	6.81±4.94		
	≥60	109(53.4)	8.23±5.43		
Household member	Living alone	12(5.9)	7.33±4.81	-.11	.912
	Not living alone	192(94.1)	7.51±5.25		
Number of children	No child	70(34.3)	7.60±5.24	.39	.701
	≥1 child	134(65.7)	7.30±5.21		
Family income (MNT)**	<1,500	82(40.2)	7.94±5.23	1.29	.198
	≥1,500	119(58.3)	6.98±5.17		
Smoking	Yes	15(7.4)	7.33±4.59	-.12	.901
	No	189(92.6)	7.51±5.27		
Alcohol use	Yes	18(8.8)	5.72±4.18	-1.51	.132
	No	186(91.2)	7.67±5.28		

M: Mean; SD: Standard deviation

*Specialty unit: including Emergency room, Intensive care unit and Operation room

**MNT: Mongolian Tugrug (1,500 MNT = 448.69 USD)

4.5 The level of psychological distress according to the general characteristics

The level of psychological distress was measured according to the general characteristics. This study evaluated the psychological distress level by Depression, Anxiety, and Stress Scale-21 [36]. According to the evaluation, the psychological distress level included depression, anxiety, and stress levels.

As a result of the ANOVA test, the level of psychological distress was detected as statistically significant differences in years of working experience ($F=5.09, p=.007$) and years of working experience at the current hospital ($F=5.2, p=.006$). The level of psychological distress was detected as a statistically significant difference in the age group ($F=4.19, p=.007$).

In the analysis of the Scheffé test, fewer years of working experienced shift nurses was evaluated with higher psychological distress than higher years of experienced shift nurses. Furthermore, young age participants had higher psychological distress than older ones. Additionally, shift nurses who take a long time from home to work was evaluated with higher anxiety levels than nurses who take less time [Table 5].

[Table 5] The level of psychological distress according to the general characteristics

(N=204)

Variable		Depression		Anxiety		Stress		Total	
		M±SD	t/F(p) Scheffé test	M±SD	t/F(p) Scheffé test	M±SD	t/F(p) Scheffé test	M±SD	t/F (p) Scheffé test
Education level (degree)	Diploma	4.71±4.79	.49(.614)	5.38±5.00	.40(.671)	5.71±4.86	.82(.441)	15.81±14.13	.58(.56)
	Bachelor	5.47±4.88		6.03±5.09		6.44±5.02		17.93±14.46	
	Master's and above	5.87±4.77		6.60±5.38		7.60±5.34		20.07±14.75	
Working department	Outpatient ward	5.79±5.39	.35(.705)	6.00±5.65	.18(.835)	6.36±6.03	.77(.463)	18.14±16.65	.41(.662)
	Inpatient ward	5.02±4.44		5.69±4.46		5.89±4.44		16.60±12.70	
	Specialty unit*	5.56±5.12		6.14±5.52		6.79 ± 5.33		18.49±15.49	
Direct caring for COVID-19 patients	Yes	5.81±4.88	1.87(.062)	6.46±5.10	2.02(.045)	6.77±4.96	1.52(.13)	19.04±14.40	1.87(.062)
	No	4.49±4.69		4.97±4.92		5.65±5.05		15.11±14.11	
Year of working experience	≤9 ^a	6.18±4.87	4.87(.009)	6.69±5.11	4.88(.009)	7.09±5.02	4.46(.013)	19.96±14.41	5.09(.007)
	10-19 ^b	5.54±5.32	a>b>c	6.41±5.50	a, b>c	6.80±5.39	a>b>c	18.74±15.65	a>b>c
	≥20 ^c	3.67±3.84		4.13±4.15		4.67±4.22		12.46±11.72	
Year of working experience at the current hospital	≤9 ^a	6.11±4.68	5.54(.005)	6.66±4.93	4.72(.01)	7.01±4.92	4.26(.015)	19.78±14.00	5.20(.006)
	10-19 ^b	5.42±5.35	a, b>c	6.07±5.53	a>b>c	6.60±5.30	a>b>c	18.09±15.46	a, b>c
	≥20 ^c	3.22±3.95		3.85±4.29		4.39±4.43		11.46±12.32	

Worked hours in the past month (hours/week)	≤40	4.87±4.57	1.64(.196)	5.41±4.68	1.57(.21)	5.98±4.61	1.05(.353)	16.26±13.39	1.49(.227)
	41-50	6.33±5.74		6.81±6.05		7.21±6.13		20.35±17.34	
	≥51	5.59±4.31		6.49±4.85		6.54±4.62		18.62±13.03	
Age (years)	22-29 ^a	6.42±4.91	4.49(.004)	6.35±5.19	3.19(.025)	7.11±5.15	4.29(.006)	19.87±14.71	4.19(.007)
	30-39 ^b	5.23±4.79	a, b, c > d	6.20±5.11	a, b, c > d	6.60±4.96	a, b, c > d	18.03±14.29	a, b, c > d
	40-49 ^c	5.73±5.13		6.49±5.34		6.83±4.99		19.05±14.96	
	≥50 ^d	2.38±2.57		3.12±3.02		3.19±3.76		8.69±8.78	
Gender	Female	5.31±4.88	-.35(.727)	5.86±5.10	-.72(.474)	6.38±5.04	.10(.919)	17.55±14.45	-.34(.738)
	Male	5.75±4.52		6.81±4.86		6.25±4.74		18.81±13.97	
Place of residence	Yurt	5.26±5.35	.44(.727)	5.22±5.02	.49(.693)	6.22±5.26	.14(.938)	16.70±14.9	.28(.842)
	House	5.17±4.80		5.93±5.20		6.63±5.04		17.73±14.37	
	Apartment	5.21±4.76		5.89±5.02		6.18±5.01		17.28±14.38	
	Other	6.43±4.82		6.96±5.23		6.70±4.91		20.09±14.57	
Distance between home and work (minutes)	<30 ^a	3.68±4.55	1.69(.187)	4.32±4.79	1.56(.212)	4.04±4.47	3.15(.045)	12.04±13.43	2.21(.112)
	30-59 ^b	5.59±5.03		6.39±5.04		6.71±4.99	a<b, c	18.69±14.57	
	≥60 ^c	5.57±4.75		6.02±5.13		6.69±5.04		18.28±14.32	
Household member	Living alone	5.58±4.68	-.18(.86)	5.33±5.26	-.42(.673)	6.42±4.25	-.03(.975)	17.33±13.68	-.08(.937)
	Not living alone	5.33±4.86		5.97±5.08		6.37±5.06		17.67±14.46	
Number of children	No child	5.10±4.75	-.97(.332)	6.04±5.07	.42(.674)	6.25±4.98	-.49(.62)	17.40±14.26	-.35(.726)
	≥1 child	5.80±5.02		5.73±5.13		6.61±5.09		18.14±14.72	

Family income (MNT)**	<1,500	5.66±5.13	.99(.32)	6.30±5.15	1.14(.256)	6.66±5.17	.83(.409)	18.61±14.87	1.03(.306)
	≥1,500	4.96±4.37		5.48±4.92		6.06±4.74		16.50±13.54	
Smoking	Yes	3.53±3.52	-1.51(.133)	5.13±4.98	-.64(.526)	5.13±4.37	-.99(.321)	13.80±12.16	-1.08(.283)
	No	5.49±4.91		6.00±5.09		6.47±5.05		17.96±14.53	
Alcohol use	Yes	3.33±3.95	-1.85(.065)	4.17±4.12	-1.55(.122)	4.22±4.09	-1.92(.057)	11.72±11.69	-1.84(.067)
	No	5.54±4.88		6.11±5.14		6.58±5.05		18.23±14.52	

M: Mean; SD: Standard deviation

*Specialty unit: including Emergency room, Intensive care unit and Operation room

**MNT: Mongolian Tugrug (1,500 MNT = 448.69 USD)

4.6 Sleep quality according to the general characteristics

The sleep quality was measured according to the general characteristics. In the analysis of the Independent t-test, the sleep quality was detected as a statistically significant difference in the direct caring for COVID-19 patients ($t=2.62, p=.01$). As a result of the ANOVA test, the sleep quality was detected as a statistically significant difference in the year of working experience at the current hospital ($F=3.19, p=.043$).

The shift nurses who were direct caring for COVID-19 patients ($M=7.87\pm 3.73$) was evaluated with poorer sleep quality than nurses who did not care for COVID-19 patients ($M=6.50\pm 3.25$). Among the participants, fewer years of working experienced shift nurses was evaluated with poorer sleep quality than higher years of experienced ones [Table 6].

[Table 6] The level of the sleep quality according to the general characteristics

(N=204)

Category	Item	n(%)	Sleep quality		
			M±SD	t/F	(p) Scheffé test
Education level (degree)	Diploma	42(20.6)	6.43±3.66	2.12	.122
	Bachelor	147(72.1)	7.57±3.66		
	Master's and above	15(7.4)	8.27±2.65		
Working department	Outpatient ward	14(6.9)	7.29±3.89	.01	.993
	Inpatient ward	88(43.1)	7.41±3.29		
	Specialty unit*	102(50.0)	7.38±3.88		
Direct caring for COVID-19 patients	Yes	132(64.7)	7.87±3.73	2.62	.01
	No	72(35.3)	6.50±3.25		
Year of working experience	≤9	96(47.0)	7.56±3.30	1.62	.201
	10-19	54(26.5)	7.81±4.17		
	≥20	54(26.5)	6.65±3.54		
Year of working experience at the current hospital	≤9 ^a	108(52.9)	7.41±3.32	3.19	.043 (a, b>c)
	10-19 ^b	55(27.0)	8.16±4.04		
	≥20 ^c	41(20.1)	6.29±3.60		
Worked hours in the past month (hours/week)	≤40	119(58.3)	7.43±3.49	2.39	.095
	41-50	48(23.5)	6.58±4.03		
	≥51	37(18.2)	8.3±3.34		
Age (years)	22-29	55(27.0)	7.31±2.94	1.08	.36
	30-39	60(29.4)	7.87±3.66		
	40-49	63(30.9)	7.43±3.97		
	≥50	26(12.7)	6.35±3.92		
Gender	Female	188(92.2)	7.30±3.63	-1.21	.228
	Male	16(7.8)	8.44±3.42		
Place of residence	Yurt	27(13.2)	7.04±4.13	1.03	.38
	House	59(28.9)	7.59±3.14		
	Apartment	95(46.6)	7.62±3.29		
	Other	23(11.3)	6.26±3.29		

Distance between home and work (minutes)	<30	25(12.3)	6.12±3.35	1.75	.176
	30-59	70(34.3)	7.56±4.07		
	≥60	109(53.4)	7.57±3.34		
Household member	Living alone	12(5.9)	5.92±2.64	-1.45	.148
	Not living alone	192(94.1)	7.48±3.66		
Number of children	No child	70(34.3)	7.46±3.72	.37	.712
	≥1 child	134(65.7)	7.26±3.44		
Family income (MNT)**	<1,500	82(40.2)	7.57±3.81	.95	.342
	≥1,500	119(58.3)	7.07±3.37		
Smoking	Yes	15(7.4)	7.39±4.18	.61	.546
	No	189(92.6)	7.43±3.58		
Alcohol use	Yes	18(8.8)	6.61±3.09	-.95	.343
	No	186(91.2)	7.46±3.67		

M: Mean; SD: Standard deviation

*Specialty unit: including Emergency room, Intensive care unit and Operation room

**MNT: Mongolian Tugrug (1,500 MNT = 448.69 USD)

4.7 The relationships between fear of COVID-19, post-traumatic stress disorder, psychological distress, and sleep quality

The correlation analysis was used to detect the relationships between fear of COVID-19, post-traumatic stress disorder, psychological distress, and sleep quality. The poor sleep quality was positively related to the fear of COVID-19 ($r=.28, p<.001$), post-traumatic stress disorder ($r=.40, p<.001$), and psychological distress ($r=.45, p<.001$), respectively [Table 7].

[Table 7] The relationships between fear of COVID-19, post-traumatic stress disorder, psychological distress, and sleep quality

(N=204)

	Fear of COVID-19	Post-traumatic stress disorder	Psychological distress	Sleep quality
	<i>r(p)</i>			
Fear of COVID-19	1			
Post-traumatic stress disorder	.46(<.001)	1		
Psychological distress	.39(<.001)	.64(<.001)	1	
Sleep quality	.28(<.001)	.40(<.001)	.45(<.001)	1

4.8 Factors affecting sleep quality

Multiple linear regression analysis was used to identify factors that affect shift nurses' sleep quality, and the analysis results are shown in Table 8. As satisfaction with the basic assumptions of regression analysis, linearity and equal variance of the model were confirmed by the result of the residual analysis. The standardized residuals were checked to see if distribution error terms could be expected. As a result, it confirmed that there weren't values greater than 3 in absolute value.

In the regression test, auto-correlation between the error terms using Durbin-Watson, there was no autocorrelation at 1.888, close to 2. The tolerance limit was 0.54 to 0.91, which was not more than 0.1. The variance inflation factor (VIF) was 1.109 to 1.853, which was detected as less than 10. As a result, all variables were identified as having no multicollinearity problem. The maximum value of Cook's distance to examine outliers was .069, which did not exceed 1.0.

Direct caring for COVID-19 patients, year of working experience at the current hospital, fear of COVID-19, PTSD, and psychological distress were analyzed as factors affecting poor sleep quality. The factor that influenced sleep quality was detected psychological distress ($\beta=.301, p<.001$) and explaining 23.8 % of the variance [Table 8].

[Table 8] Factors affecting sleep quality

(N=204)

Variable	B	SE	β	t	p
(Constant)	5.765	1.182		4.877	<.001
Direct caring for COVID-19 patients	-.861	.492	-.114	-1.75	.082
Year of working experience at the current hospital	-.007	.024	-.019	-.294	.769
Fear of COVID-19	.037	.039	.067	.941	.348
Post-traumatic stress disorder	.109	.059	.157	1.861	.064
Psychological distress	.076	.021	.301	3.629	<.001

R²=.238, Adj.R²=.218, F=12.35 (p<.001),
Durbin-Watson=1.888

SE: Standard error

5. DISCUSSION

This study aimed to identify the relationship between fear of COVID-19, PTSD, psychological distress, and sleep quality and to determine the factors influencing sleep quality among shift nurses working in state central tertiary hospitals in Ulaanbaatar, Mongolia, particularly during the COVID-19 pandemic. The average sleep quality level of Mongolian shift nurses was 7.39 ± 3.62 points, and 65.2% with a cut-off point of 5 points or more responded that they were experiencing poor sleep quality. A previous study [115] measured the prevalence of insomnia in 31.8% of Mongolian shift nurses prior to the COVID-19 pandemic. In another country, Maqbali et al. [116] found that the prevalence of poor sleep quality was detected at (58.8%) with an average score of 7.04 ± 1.59 among nurses. The sleep quality of the subjects in this study was similar to or somewhat worse than the results of previous studies. This study found that direct care for patients with COVID-19 and the length of their current working experience in hospitals were associated with poor sleep quality among Mongolian shift nurses. Several previous studies have reported that poor sleep quality levels are related to work experience, caring for patients with COVID-19, shift work cycles, whether many patients are treated at night, and long working hours per week [13], [116]–[118]. These results imply that the direct care of patients with COVID-19 or poor shift work-related environments may affect their sleep quality. Poor sleep quality, such as lack of sleep or regularity, negatively affects the physical and psychological health of nurses. Moreover, it affects safe nursing practices, resulting in poor patient outcomes. Therefore, nursing administrators and managers need to identify the factors that affect the sleep quality of shift nurses and make efforts to improve their shift work environment. Although many previous studies have actively intervened by evaluating the quality of sleep for nurses and improving it through various interventions, studies on Mongolian shift nurses have rarely been conducted. More attention

should be paid to the sleep health of shift nurses working in Mongolia, where the social infrastructure is relatively poor compared to other developed countries.

In this study, 37.3% of shift nurses reported high fear of COVID-19, with an average score of 19.77 ± 6.64 . In a recent review study [44] on fear of COVID-19, 77.1% of the participants responded that they had high fear. The results of this study are relatively low compared with those of previous studies. The review paper reported that the level of these nurses' psychological variables had a large variance. This difference can be attributed to the socioeconomic and environmental characteristics of the country or region where the study was conducted or the characteristics of the pandemic that changed over time. In the review study [44], it seems that there was such a difference because data were collected during the first nine months of the COVID-19 pandemic. In this study, shift nurses' fear of COVID-19 was related to whether they directly cared for patients with COVID-19 and the distance between home and work. Previous studies [19], [21], [119] have reported that shift work, attendance in COVID-19-related education, direct care for COVID-19 patients, level of social support, and psychological distress are associated with fear of COVID-19. It was found that fear of COVID-19 was higher for the subjects of this study if it took them more than 30 minutes to get home from the hospital where they worked. In addition, 53.4% reported taking more than an hour. In Ulaanbaatar, the capital of Mongolia, public transportation such as buses and taxis are mainly used, but traffic jams are severe owing to underdevelopment. As a result, the time to use public transportation increases, and contact with people is very frequent. However, in October 2021, legal rules and regulations related to the COVID-19 pandemic began to loosen in Mongolia [120]. Regulations on preventive activities such as mask-wearing obligations and proper distancing in public places have gradually loosened. While the general public lives under looser guidelines, shift nurses working in hospitals still have abundant contact with COVID patients. Since the time required to reach home was still long, and there was much contact with the public, it is thought that the fear of Corona 19 was even higher.

In this study, the prevalence of PTSD was 12.7%, with an average score of 7.50 ± 5.22 . Previous studies [24], [121] have revealed that the prevalence of PTSD was 22.2% among ICU nurses and 73.3% among critical nurses providing patient care during the early phase of the pandemic. The results of this study are relatively low compared with those of previous studies. The factors associated with PTSD were not measured in this study according to their general characteristics. Lee et al. [122] demonstrated that nurses' secondary traumatic stress and mental illness are associated with fear of COVID-19. Ruth et al. [123] revealed moderate levels of posttraumatic growth; a positive psychological change observed in approximately one in five participants during the COVID-19 pandemic. The wide variability in the prevalence of PTSD is because specific measures are taken to contain the spread of the disease [124]. It is expected to be higher if shift nurses have been directly infected with COVID-19, experienced serious complications, cared for seriously ill patients, or experienced a patient's death. In addition, the difference in PTSD levels will be large depending on the case of the nurse's family, close relatives, or friends who have been infected with COVID-19 or experienced death due to it. However, this study did not consider the characteristics of the subjects.

The prevalence of psychological distress was 51.5%, with an average score of 17.65 ± 14.39 . Psychological distress measured moderate-to-severe levels of depression (52%), anxiety (59.3%), and stress (35.8%). A previous study [26] measured mild-to-severe levels of depression (36.5%), anxiety (64.6%), and stress (23.2%) among Mongolian frontline nurses. The results of this study are similar to those of previous studies. The psychological distress most verbalized by the nurses was depression, anxiety, and stress during the COVID-19 pandemic [125]. As a result of a higher level of psychological distress, it might also negatively affect shift nurses' psychological well-being. In a previous study [116], nurses' psychological distress was found to be associated with sleep quality. This pandemic may affect them psychologically because of their lack of preparedness and social support for this novel disease.

It is essential to develop psychological interventions and implement social support programs for nurses.

In this study, shift nurses' psychological distress levels were associated with years of work experience, age, and distance between home and work. In previous studies, psychological distress was associated with fewer years of experience, working on night shifts, caring for COVID-19 patients, lack of training, and young age among nurses and healthcare personnel [69], [80], [84]. In line with previous studies, younger and less experienced shift nurses had higher levels of psychological distress in this study. Psychological distress among nurses, such as work-related stress, has significantly increased during the pandemic. In this study, the majority (41.7%) of the participants reported working (≥ 40 hrs/week) long hours. These results suggest that differentiated interventions should be planned by considering the work experience or work environment of shift nurses. New nurses with less work experience or relatively young nurses have a higher risk of being exposed to psychological distress; therefore, more attention should be paid to them. In addition, to provide administrative support for nurses with increased work in special circumstances, such as the COVID-19 pandemic, a close review of average working hours and conditions should be performed.

Psychological distress was associated with nurses' fear of COVID-19, PTSD, and sleep quality. Multiple regression analysis revealed that the level of psychological distress was a factor that affected the sleep quality of shift nurses. A similar result was reported by Mohammed et al. [116], Zhi et al. [126], and Dong et al. [127] among nurses during the COVID-19 pandemic. Previous studies conducted before the pandemic showed that poor sleep quality was associated with age, sex, years of experience, facing COVID-19 patients, shift work, many patients in charge at night, and long work hours per week among nurses [13], [116]–[118]. Furthermore, several researchers [11], [15], [28]–[30] have suggested that poor sleep quality is associated with fear of COVID-19, PTSD, and psychological distress, such as depression, anxiety, and stress among nurses during the pandemic. Unlike previous studies, this

study found that fear of COVID-19 and PTSD did not affect sleep quality among Mongolian nurses. These results can be interpreted as the fact that various sleep quality predictor variables exist and Mongolian shift nurses' reality and differences in occupational and health conditions from nurses in other countries. In addition, the comparability between Mongolian shift nurses and determining the cause of psychological distress is not easy because of insufficient previous studies. Furthermore, an accurate determination of the causal relationship between psychological distress and poor sleep quality is not possible. This may be the result of a cross-sectional study conducted using a survey questionnaire. Therefore, a longitudinal and qualitative study is required to measure the prevalence of and changes in psychological distress and poor sleep quality.

Consistent with these findings, it is necessary to reduce psychological distress to improve sleep quality. Kim et al. [128] demonstrated the effectiveness of cognitive-behavioral stress management programs for nurses and found that reducing psychological stress, changing mood states positively, and improving ways of coping with stress effectively. Implementing a cognitive-behavioral stress management program on psychological stress and sleep quality among shift nurses is suggested. In addition, Chiang et al. [129] found that hospital nurses' work schedule characteristics are associated with lifestyle patterns, dietary behavior, sleep patterns, and perceived stress. Implementing a proper schedule and role management is essential for decreasing job-related stress. Hence, high-workload unit nurses need to rotate with other unit nurses, and night-shift nurses need to perform day-shift work. Work rotation might help recover from sleep disturbance and have positive consequences for learning by working in different units. In addition, a previous study by Kazuhiro et al. [109] demonstrated that shift nurses taking 90 mins naps showed lower drowsiness and less fatigue at the end of the night shift. It can include assessing the workload and organizing work breaks during night shifts. Efforts to improve sleep quality through customized intervention programs that reduce psychological distress for shift nurses and flexible work environment adjustments in the

context of a new infectious disease pandemic can be expected to positively impact patient outcomes and shift nurse health.

6. CONCLUSIONS AND SUGGESTION

This study aimed to identify the factors affecting the sleep quality of 204 shift nurses in Mongolia, particularly during the COVID-19 pandemic. The level of fear of COVID-19, PTSD, and high levels of poor sleep quality and psychological distress were detected in this study. Psychological distress has been identified as a factor affecting sleep quality.

This study had several limitations. First, because this study was conducted in two central state hospitals in Ulaanbaatar city, Mongolia, it cannot be generalized to all Mongolian nurses. Second, because the data collection for this study was conducted in the later phase of the COVID-19 pandemic rather than in the early phase, it is expected that there will be differences due to the time period used for analysis. It is difficult to identify longitudinal changes over time when the data are collected from a cross-sectional perspective. In the future, it will be necessary to conduct a longitudinal study to confirm the changes in sleep quality and related variables over time as new infectious diseases spread. Despite these limitations, this study prepared basic data for planning a customized intervention program to improve these by identifying fear of COVID-19, PTSD, psychological distress, sleep quality level, and influencing factors among Mongolian shift nurses.

In particular, in the era of the epidemic of new infectious diseases, including COVID-19, it is more difficult to manage the mental health of nurses working shifts because they are exposed to unexpected situations and environments related to the infection. Therefore, active management is required to improve sleep quality, which affects physical and mental health. Based on the limitations and suggestions of this study, it is necessary to decrease psychological distress related to sleep quality. First, it is necessary to develop a cognitive-behavioral intervention program to improve the psychological distress and sleep quality of shift nurses and evaluate its effectiveness. Efforts should continue to improve psychological well-being in the

long term by assessing the risk factors for psychological distress and providing essential psychological support.

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APPENDIX

1. Study statement

СУДАЛГААНЫ ТАНИЛЦУУЛГА

■ Судалгааны сэдэв /Монгол/

Ковид-19 цар тахлын үед Монгол Улсын гуравдугаар шатлалын эмнэлэгт ажиллаж буй ээлжийн сувилагчийн нойрны чанарт нөлөөлж буй хүчин зүйлсийн судлах нь

■ Study title /English/

Factors affecting sleep quality of shift nurses in Mongolia during the COVID-19 pandemic

■ Судлаач, хамтран судлаачийн овог, нэр, албан тушаал

Албан тушаал	Овог нэр	Байгууллага	Албан тушаал
Судлаач	Алтанцэцэг Мөнхтуяа	Чусонь Их Сургууль, Сувилахуйн Тэнхим	Магистрант
Хамтран судлаач			
Хамтран судлаач			
Судалгааны ахлах			

※ Таныг бидний судалгаанд оролцоно уу хэмээн энэхүү хүсэлтийг илгээж байна. Та судалгаанд оролцох эсэхээ шийдэхийн өмнө доорх агуулгыг анхааралтай уншиж танилцана уу. Энэхүү судалгаа нь таны сайн дурын оролцооны үндсэн дээр хийгдэх бөгөөд судалгааны талаар шаардлагатай мэдээлэл болон асуух зүйлсээ судлаачаас чөлөөтэй лавлаж асууна уу. Шаардлагатай мэдээллээ хангалттай авсан гэж үзвэл судалгаанд оролцохыг зөвшөөрсөн гарын үсгээ зурж, он сар өдрөө тэмдэглэнэ үү. Зөвхөн шаардлагатай тохиолдолд судлаач гарын үсгээ зурж баталгаажсан зөвшөөрлийн хуудасны хувилбарыг судалгаа бүрэн хийгдэж дууссаны дараа таны цахим хаяг руу илгээж болно.

1. Судалгааны зорилго

Энэхүү судалгааны зорилго нь ковид-19 цар тахлын үед Монгол Улсын гуравдугаар шатлалын төв эмнэлэгт ажиллаж буй сувилагч нарын нойрны чанарт нөлөөлж буй хүчин зүйлсийг тодорхойлоход оршино.

2. Судалгаанд оролцогчийн тоо болон судалгаанд хамрагдах хугацаа

- Судалгааг явуулах хугацаа нь Чусонь Их Сургуулийн Ёс Зүйн Хорооны зөвшөөрөл олгогдсоноос хойш 1 жилийн хугацаанд хийж гүйцэтгэнэ.
- Судалгаанд нийтдээ 222 сувилагчийг хамруулах ба судалгааны асуумжийг бөглөхөд ойролцоогоор 15 минут зарцуулагдана.

3. Судалгаанд оролцогч нарт хийгдэх шинжилгээ болон журам

- Байхгүй

4. Туршилтын болон хяналтын бүлэгт санамсаргүй түүврийн аргаар хуваарилах эсэх болон магадлал

- Байхгүй

5. Судалгаанд оролцогч нарын анхаарах зүйлс

- Судалгаанд хамрагдахын өмнө судалгааны танилцуулга, зөвшөөрлийн хуудастай сайтар танилцах
- Энэхүү судалгаанд зөвхөн өөрийн сайн дураар оролцохыг зөвшөөрсөн оролцогч нар хамрагдах
- Оролцогч нь судалгааны асуумжийг дуустал, бүрэн гүйцэт бөглөх бөгөөд ойролцоогоор 15 минут зарцуулагдана.
- Судалгааг бөглөж дууссаны дараа, асуумжтай хамт тараагдсан дугтуйнд хийж битүүмжлэн томилогдсон судлаачид хүлээлгэж өгнө.

6. Судалгаанд оролцогч нарт хүлээгдэж буй ашиг болон санхүүгийн урамшуулал

- Та энэхүү судалгаанд оролцсоноор Монголын гуравдугаар шатлалын сувилагч нарын нойрны чанарт Ковид-19-ийн айдас, сэтгэл зүйн хямралд нөлөөлж буй хүчин зүйлсийг судлахад хувь нэмрээ оруулах болно.
- Мөн энэхүү судалгаанд хамрагдсанаар ямар нэгэн мөнгөн болон санхүүгийн урамшуулал байхгүй боловч гарын бэлгийг(ойролцоогоор Солонгос улсын мөнгөн дүнгээр 1,000вонтой тэнцэх) судалгаанд оролцсоны дараа урамшуулал болгон авах болно.

7. Судалгаанд оролцогч нарт үүсэх эрсдэл болон тааламжгүй нөлөөлөл

- Асуумж судалгааг бөглөхтэй холбоотойгоор үүсэх эрсдэл байхгүй хэдий ч зарим хүмүүст судалгааны агуулга, чиг хандлагаас хамаараад таагүй мэдрэмж төрж болох ба хүссэн үедээ судалгааг бөглөхөө/оролцохоо зогсоож болно. Судалгаанд оролцох явцад үүсэж болох эрсдэлт хүчин зүйлийн талаар асуух зүйл байвал судлаачтай холбоо барина уу.
- Судалгааг үргэлжлүүлэхээс татгалзсан тохиолдолд танд ямар нэгэн торгууль, шийтгэл ногдуулахгүй.

8. Судалгаанд хамрагдах үед хохирол учирсан тохиолдолд оролцогчдод олгох нөхөн олговор болон эмчилгээ

- Байхгүй

9. Судалгаанд хамрагдахын тулд оролцогчоос гарах зардал

- Энэхүү судалгаанд хамрагдахын тулд оролцогчоос ямар нэгэн зардал гарахгүй.

10. Судалгаанд оролцогч нарын сонгож болон бусад зүйл

- Байхгүй

11. Судалгаанд хамрагдах таны шийдвэр нь сайн дурын үндсэн дээр байх ба судалгааны явцад хэдийд ч судалгааг үргэлжлүүлэхээс татгалзаж болно.

- Энэхүү судалгаанд хамрагдахын тулд судлаачаас хангалттай хэмжээний мэдээллийг авсан байх бөгөөд судалгаанд сайн дураараа оролцох. Хэрэв та судалгааг үргэлжлүүлэхээс татгалзсан тохиолдолд танд ямар нэгэн торгууль, шийтгэл ногдуулахгүй, мөн та заавал оролцох албагүй. Нэмэлтээр дурдахад, судалгаанд оролцохоор зөвшөөрлийн гарын үсэг зурсан ч, шалтгаан тоочилгүй хүссэн үедээ судалгааг үргэлжлүүлэхээс татгалзаж болно.

12. Таны хувийн мэдээлэл нууцлагдах бөгөөд энэхүү судалгааны судлаач нараас өөр хүн мэдээллийг авах боломжгүй.

- Таны өгсөн мэдээлэл нь нууц бөгөөд нийтэд нээлттэй биш юм. Зөвшөөрлийн хуудсанд гарын үсэг зурснаар та судлаачид таны мэдээллийг шууд ашиглах зөвшөөрлийг олгож байгаа бөгөөд судалгааны үр дүнг нийтлэхэд таны хувийн мэдээллийг нууцлах болно.
- Энэхүү судалгааг Чосун их сургуулийн IRB хорооноос зөвшөөрөл авсны дараа судалгаа явагдаж байгаа болно. Судалгаанд оролцогч нь 2 долоо хоногийн дотор бөглөсөн судалгааны асуумжийг судлаачид хүлээлгэн өгөх боломжтой.
- Цуглуулсан өгөгдлийг компьютер дээр кодлон, судалгааны боловсруулалт хийнэ. Энэхүү өгөгдлийг 3 жилийн хугацаанд хадгалагдаж, удирдах бөгөөд хувийн нууцыг хамгаалах дүрэм, журмын дагуу хийж гүйцэтгэнэ.
- Судалгаанд оролцогчдын бөглөсөн асуумж хуудсыг судалгаа бүрэн гүйцэт дууссаны дараа цоожтой шүүгээнд хадгалж, 3 жилийн дараа устгана.
- Судалгаанд оролцохоос татгалзсан тохиолдолд, тухайн субъектийн холбогдох мэдээллийг нэн даруй баримтжуулан устгаж, судалгааны нууцлалыг (нууцлалыг хадгалах) алдагдуулахгүйгээр дүрэм журмын хүрээнд үйл ажиллагааг явуулна.
- Энэхүү судалгаа нь холбогдох дүрэм журамд заасны дагуу судалгааны сэдвийн нууцлалыг зөрчихгүй явуулах ба тодорхой зөвшөөрөл бүхий хүмүүс (жишээ нь, Чосун их сургуулийн IRB хорооны гишүүн, судлаач) судалгааны сэдвүүдийн бүртгэлд хандах боломжтой.

13. Судалгаатай холбоотой шинэ мэдээлэл цуглуулсан тохиолдолд судалгаанд оролцогч нарт мэдээлэл хүргэнэ.

- Судалгааны явцад, хэрэв бид судалгаанд оролцогч нарын сайн-сайхан байдал (эрүүл байх)-д нөлөөтэй мэдээллийг илрүүлбэл оролцогч нарт мэдээлэл хүргэнэ.

14. Судалгаанд хамрагдахыг хязгаарлах шалтгаан

- Дараах тохиолдолд таны зөвшөөрөлгүйгээр судалгаанд оролцохыг хязгаарлаж болно.

Үүнд:

- Судлаачийн зааварчилгааг дагаж, мөрдөөгүй тохиолдолд

15. Чосун Их Сургуулийн Ёс Зүйн Хороотой холбоо барих хаяг

Энэхүү судалгаанд Чосонь Их Сургуулийн Ёс Зүйн Хорооны зөвшөөрөл авах бөгөөд

хэрэв асууж тодруулах зүйл гарвал дараах хаягаар холбогдоно уу (нэрээ нууцалж болно).
IRB Committee of Chosun University Tel: 062-230-7640~3, Email: irb@chosun.ac.kr

СУДАЛГААНЫ ТАНИЛЦУУЛГА

Дугаар: _____

Сайн байна уу?

БНСУ-ын Чусонь Их Сургуулийн төгсөлтийн дараах сургуулийн Сувилахуйн Тэнхимийн магистрант А.Мөнхтуяа миний бие энэхүү судалгааг явуулж байгаа бөгөөд үнэтэй цагаа зарцуулан судалгаанд хамрагдаж буй явдалд тань гүнээ талархаж байна.

Энэхүү судалгаа нь Монгол Улсын гуравдугаар шатлалын эмнэлэгт ажиллаж буй ээлжийн сувилагч нарын нойрны чанарт нөлөөлж буй хүчин зүйлсийг тодорхойлох ба мөн ковид-19-өөс айх айдас, гэмтлийн дараах эмгэг, сэтгэл зүйн хямралын түвшинг тодорхойлж, тэдгээрийн хамаарлыг судлах судалгаа болно. Судалгааны үр дүнгээр сувилагч нарын нойрны чанарт нөлөөлж буй хүчин зүйлсийн нөлөөллийг судлах замаар сэтгэл зүйн хямралыг бууруулах, нойрны чанарыг сайжруулах цаашдын авах арга хэмжээнд хувь нэмэр оруулахад оршино.

Дараах асуумж судалгаанд хариулахад ойролцоогоор 15 минут зарцуулагдана. Асуултанд хариулахад зөв эсвэл буруу хариулт гэж байхгүй бөгөөд та өөрийн мэдээллээ зөв, шударгаар хариулахад болно. Судалгааны асуумжинд хариулж дууссаны дараа таны нууцлалыг хадгалах үүднээс өгөгдсөн дугтуйнд хийж, битүүмжлэн өгнө үү. Хариулт бүрэн гүйцэт эсэхийг судалгаа цуглуулж буй судлаач хянаж авах ба таны хариултыг нууцалж, энэхүү материалыг уг судалгааны ажлаас өөр зорилгоор ашиглахгүй гэдгийг амлаж байна.

2022 оны 9 дүгээр сар

Судлаач: Алтанцэцэг овогтой Мөнхтуяа

Судалгааг авсан: Э.Сувд-Эрдэнэ

СУДАЛГААНД ОРОЛЦОХ ЗӨВШӨӨРЛИЙН ХУУДАС

Судалгааны нэр (Монгол хэлээр): Ковид-19 цар тахлын үед Монгол Улсын гуравдугаар шатлалын эмнэлэгт ажиллаж буй ээлжийн сувилагчийн нойрны чанарт нөөлөлж буй хүчин зүйлсийг судлах нь

Би дээрх судалгааны талаар тайлбар авч, судалгааны танилцуулгыг уншиж, судалгааны агуулгыг бүрэн ойлгосон болно.

Би энэхүү судалгаан хамрагдсанаар учирч болох эрсдэл (сул тал) болон ашиг тусыг (ашиг) сонсож, бүрэн ойлгосон.

Би энэ судалгаанд сайн дураараа оролцохыг зөвшөөрч байна.

Би ямар ч үед судалгаанд оролцохоос татгалзах, мөн хүссэн үедээ судалгааг үргэлжлүүлэхээс татгалзаж болох бөгөөд энэ шийдвэр нь надад ямар нэгэн байдлаар хохирол учруулахгүй гэдгийг ойлгож байна.

Энэхүү зөвшөөрлийн маягтанд гарын үсэг зурснаар, судлаач нь одоогийн хууль тогтоомжоор зөвшөөрөгдсөн хэм хэмжээний хүрээнд миний хувийн мэдээллийг цуглуулж, боловсруулахыг зөвшөөрч байна.

Би судлаачид хүсэлт гаргасан тохиолдолд энэхүү зөвшөөрлийн хуудсын хуулбарыг авах боломжтой гэдгийг ойлгож байна.

Судалгаанд оролцогч (Нэр): _____ (Гар/үсэг): _____

_____ он/ _____ сар/ _____ өдөр

2. Survey questionnaire

СУДАЛГААНЫ АСУУМЖ

утасны/д:									
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Та өөрт тохирох хариултыг ✓ сонгоно уу.

Ерөнхий асуумж

- 1) Таны нас: _____
- 2) Хүйс:
 - ① Эмэгтэй
 - ② Эрэгтэй
 - ③ Бусад
- 3) Оршин сууж буй газар:
 - ① Гэр
 - ② Байшин
 - ③ Орон сууц
 - ④ Бусад: /түрээс гэх мэт/ _____
- 4) Та гэртээ хэдүүлээ амьдардаг вэ?
 - ① Ганцаараа амьдардаг
 - ② _____ хүнтэй (гишүүн) хамт амьдардаг
- 5) Та 0-18 насны хүүхэдтэй юу?
 - ① Тийм -> _____ хүүхэдтэй
 - ② Үгүй
- 6) Ажил гэрийн хооронд явахдаа хэр зэрэг хугацаа зарцуулдаг вэ?
 - ① 30 минутаас доош
 - ② 30-60 минут
 - ③ 1-2 цаг
 - ④ 2 цагаас дээш
- 7) Таны боловсролын зэрэг юу вэ?
 - ① Диплом
 - ② Бакалавр
 - ③ Магистр болон түүнээс дээш
- 8) Таны одоо ажиллаж буй тасаг нэгж:
 - ① Амбулаторийн тасаг
 - ② Хэвтэн эмчлүүлэх тасаг
 - ③ Эрчимт эмчилгээний тасаг

- ④ Яаралтай тусламжийн тасаг
 - ⑤ Мэс заслын тасаг
 - ⑥ Бусад: _____
- 9) Ковид-19-ийн халдвар авсан эмчлүүлэгчдэд тусламж үйлчилгээ үзүүлдэг үү?
- ① Тийм -> өдөрт _____ тооны эмчлүүлэгч
 - ② Үгүй
- 10) Таны сувилагчаар ажилласан ажлын туршлага: _____ жил _____ сар
- 11) Тус эмнэлэгт ажилласан ажлын туршлага: _____ жил _____ сар
- 12) Таны өмнөх сард ажилласан нийт ажлын цаг: _____ цаг _____ минут
- 13) Танай гэр бүлийн өрхийн нийт орлого: _____ төгрөг
- 14) Та тамхи татдаг уу?
- ① Тийм -> өдөрт _____ ширхэг
 - ② Үгүй
- 15) Та архи уудаг уу?
- ① Тийм -> сард _____ удаа
 - ② Үгүй
- 16) Та нойрны асуудалтай холбоотойгоор эмчилгээ хийлгэж байгаа юу?
- ① Тийм /бол хугацаа гэх мэтийг тодорхойлбол: _____
 - ② Үгүй

Та өөрт тохирох хариултыг ✓ сонгоно уу.

N	Ковид-19-өөс айх айдсыг үнэлэх асуумж (FCV-19S)	огт санал нийлэхгүй	санал нийлэхгүй	аль нь ч биш	санал нийлнэ	үнэхээр санал нийлнэ
1	Би ковид-19-өөс маш их айж байна.	①	②	③	④	⑤
2	Би ковид-19-ийн талаар бодоход тухгүй болдог.	①	②	③	④	⑤
3	Ковид-19-ийн талаар бодоход миний гар хүйт дааж хөлөрдөг.	①	②	③	④	⑤
4	Би ковид-19-ийн улмаас амиа алдах вий гэдгээс айж байна.	①	②	③	④	⑤
5	Олон нийтийн мэдээллийн хэрэгслээр ковид-19-ийн тухай мэдээ, мэдээллийг үзэж байхдаа би санаа зовох эсвэл сэтгэл түгшдэг.	①	②	③	④	⑤
6	Би ковид-19-ийн халдвар авахаас санаа зовоод унтаж чаддаггүй.	①	②	③	④	⑤
7	Би ковид-19-ийн халдвар авсан байх гэж бодохоор зүрхний цохилт ихсэх эсвэл зүрх дэлсдэг.	①	②	③	④	⑤

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N	Сэтгэл зүйн гэмтлээс үүсэх нөлөөг илрүүлэх асуумж (IES-6)	Огт үгүй	Бага зэрэг	Дунд зэрэг	Их	Маш их
1	Бодохгүй байа гэсэн ч тэр(тухайн үйл явдал) тухай байнга боддог.	◎	①	②	③	④
2	Би тухайн үйл явдал тохиолдоно гээд үргэлж анхаарал сэрэмжтэй байдаг.	◎	①	②	③	④
3	Бусад зүйлс ч намайг тэр(тухайн үйл явдал) тухай бодоход хүргэдэг.	◎	①	②	③	④
4	Би тэр(тухайн үйл явдал) талаар маш их бодсоор байгаагаа мэдсэн ч бодлоо зогсоож чаддаггүй.	◎	①	②	③	④
5	Би тэр(тухайн үйл явдал) тухай бодохгүй байхыг хичээдэг.	◎	①	②	③	④
6	Би төвлөрч чаддаггүй.	◎	①	②	③	④

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Тодорхойлолтыг уншаад өнгөрсөн 7 хоногийн хугацаанд танд хамгийн их тохиолдсон нэг тоог дугуйлна уу, Зөв ба буруу хариулт гэж байхгүй тул их цаг зарцуулахгүй хариулна уу.

N	Сэтгэлийн хямрал, Сэтгэлийн түгшүүр, Стрессийн хэмжүүр (DASS-21)	Надад тохиолдоогүй	Надад заримдаа буюу бага хэмжээгээр тохиолдсон	Надад тодорхой хэмжээгээр буюу тодорхой хугацаанд тохиолдсон	Надад маш олон тохиолдсон буюу ихэвчлэн тохиолддог
1	Тайвширч чадахгүй байгаага олж мэдсэн.	○	①	②	③
2	Ам хатахыг мэдэрсэн.	○	①	②	③
3	Бүх зүйлээс ямар нэг эерэг мэдрэмж авч чадахгүй буй мэт санагдсан.	○	①	②	③
4	Амьсгалахад төвөгтэй болж байсан (ялангуяа хэт их амьсгаадах, биеийн ачаалал аваагүй байхад амьсгаадах).	○	①	②	③
5	Санаачлага гарган аливаа зүйлийг хийх ажиллахад хэцүү байсан.	○	①	②	③
6	Би нөхцөл байдалд хэт хариу урвал үзүүлэх хандлагатай байсан.	○	①	②	③
7	Би салгалж чичирч байсан (жишээ нь гар).	○	①	②	③
8	Би их хэмжээний мэдрэлийн хүч зарцуулж байгаага мэдэрч байсан.	○	①	②	③
9	Өөрийгөө эвгүй байдалд оруулах, сандарч самгардаж магадгүй нөхцөл байдлын тухай санаа зовж байсан.	○	①	②	③
10	Надад хүсэн хүлээх зүйл юу ч байхгүй мэт мэдрэгдэж байсан.	○	①	②	③
11	Өөрийнхөө хямарсан, түгшсэн байгааг олж мэдэж байсан.	○	①	②	③
12	Тайвшрахад хэцүү байгаага мэдэрч байсан.	○	①	②	③
13	Би уруу царайтай, гутарсан байгаага мэдэрч байсан.	○	①	②	③
14	Би хийж байсан юмаа дуусгахад саад болсон зүйлийг тэвчиж чадаагүй.	○	①	②	③
15	Би учраа олохгүй байдалд ороход ойр байгааг мэдэрч байсан.	○	①	②	③
16	Би ямар нэгэн зүйлд урам зоригтой байх боломжгүй байсан.	○	①	②	③
17	Би хүн шиг үнэ цэнэтэй биш мэт мэдэрч байсан.	○	①	②	③
18	Би хэтэрхий түргэн ууртай болсон.	○	①	②	③
19	Биеийн ачаалал аваагүй боловч зүрх дэлсэхийг мэдэрч байсан (зүрхний агшилт түргэссэн эсвэл зүрх зогссон мэт мэдрэгдэх)	○	①	②	③
20	Ямар нэг тодорхой шалтгаангүйгээр айдас хүрч байсан.	○	①	②	③
21	Амьдрал утгагүй мэт мэдрэгдсэн	○	①	②	③

ПИТТСБУРГИЙН НОЙРНЫ ЧАНАРЫН ИНДЕКС (PSQI)

Зааварчилгаа: Дараах асуултууд нь таны сүүлийн 1 сарын хугацааны хэвийн унтах дадал зуршилтай холбоотой юм. Хариултууд нь өнгөрсөн нэг сарын таны ихэнх өдөр болон шөнө-д хамгийн үнэн, зөв/тохирох хариултыг тодорхойлно уу. Та асуултуудыг сайтар уншиж бөглөнө үү. Та өөрт тохирох хариултыг √ сонгоно уу.

1. Өнгөрсөн нэг сарын хугацаанд, та ихэвчлэн шөнө хэдэн цагт орондоо орсон бэ?
ОРОНДОО ОРСОН ЦАГ _____
2. Өнгөрсөн нэг сарын хугацаанд, та орой бүр орондоо орсны дараа нойрсоход хэдий хугацаа (хэдэн минут) зарцуулсан бэ?
ХУГАЦААГ МИНУТААР _____
3. Өнгөрсөн нэг сарын хугацаанд, та өглөө ихэнхидээ хэдэн цагт боссон бэ?
БОССОН ЦАГ _____
4. Өнгөрсөн нэг сарын хугацаанд, та шөнө яг хэдэн цаг унтсан бэ? (Энэ нь таны орондоо өнгөрүүлсэн цагнаас өөр)
НЭГ ШӨНӨ УНТСАН ЦАГ _____

Доорх асуултанд хариулахдаа өөрт тохирох хамгийн зөв, нэг хариултыг сонгоно уу. Бүх асуултанд хариулна уу.

5. Өнгөрсөн нэг сарын хугацаанд, унтахад асуудал хэр олон удаа танд тулгарч байсан бэ, учир нь ...
 - a) 30 минутын дотор унтаж чаддаггүй

<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	---	--	--
 - b) Шөнө дунд эсвэл өглөө эрт сэрдэг

<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	---	--	--
 - c) 00-ын өрөө орохоор босох хэрэгтэй болдог

<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	---	--	--
 - d) Чөлөөтэй амьсгалж чаддаггүй

<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	---	--	--
 - e) Ханиах эсвэл чанга хурхирдаг

<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	---	--	--
 - f) Хэт их даардаг

<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	---	--	--
 - g) Хэт их халууцдаг

<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	---	--	--
 - h) Хар дарж зүүдэлдэг

<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	---	--	--
 - i) Өвдөлт мэдэрдэг

<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	---	--	--
 - j) Өөр шалтгаан(ууд) байвал тодорхойлж бичнэ үү: _____

Энэхүү шалтгаанаас болоод өнгөрсөн нэг сарын хугацаанд танд унтахад асуудал хэр олон удаа тулгарч байсан бэ?

- | | | | | |
|--|--|---|--|--|
| | <input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй | <input type="checkbox"/> Долоо хоногт 1-ээс бага удаа | <input type="checkbox"/> Долоо хоногт 1-2 удаа | <input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа |
|--|--|---|--|--|
6. Та өнгөрсөн нэг сарын нойрны чанараа ерөнхийд нь хэрхэн үнэлэх вэ?

<input type="checkbox"/> Маш сайн	<input type="checkbox"/> Сайн	<input type="checkbox"/> Муу	<input type="checkbox"/> Маш муу
-----------------------------------	-------------------------------	------------------------------	----------------------------------
 7. Та сүүлийн нэг сард, унтахын тулд хэр олон удаа эм уусан бэ? (эмчийн жороор олгодог эм эсвэл эмчийн жор шаардлагагүй эм)

	<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	--	---	--	--
 8. Өнгөрсөн нэг сарын хугацаанд машин жолоодох, хоол идэх эсвэл ямар нэгэн нийтийн арга хэмжээнд оролцож байхдаа сэрүүн байхад хэр хэцүү байсан бэ?

	<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	--	---	--	--
 9. Өнгөрсөн нэг сарын хугацаанд, ажлаа амжуулахын тулд хангалттай хэмжээний урам зоригтой байх нь бэрхшээлтэй байсан уу?

	<input type="checkbox"/> Ямар ч асуудалгүй	<input type="checkbox"/> Маш бага зэргийн асуудал	<input type="checkbox"/> Ямар нэг хэмжээгээр асуудал	<input type="checkbox"/> Маш том асуудал
--	--	---	--	--
 10. Та нэг оронд эсвэл өрөөндөө хүнтэй хамт унтдаг уу?
 - Нэг оронд эсвэл өрөөнд хамт унтдаг хүн байхгүй
 - Хажуугийн өрөөнд хүн унтдаг
 - Нэг өрөөнд хүн унтдагч ч нэг оронд хамт унтдаггүй
 - Нэг оронд хүнтэй хамт унтдаг

Хэрвээ та орондоо эсвэл өрөөндөө хамтрагчтай бол, өнгөрсөн нэг сарын турш доорх зүйлс хэр олон удаа танд тохиолдсоныг хамтрагчаасаа асууж бөглөнө үү.

- a. Чангаар хурхирах

	<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	--	---	--	--
 - b. Унтаж байхдаа амьсгалаа удаан түгждэг үү? (амьсгал хооронд удаан завсарлах)

	<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	--	---	--	--
 - c. Унтаж байхдаа хөл татваганах эсвэл салганах

	<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	--	---	--	--
 - d. Унтаж байхдаа чиг баримжаа алдах эсвэл ухаан санаа самуурах тохиолдол

	<input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй	<input type="checkbox"/> Долоо хоногт 1-ээс бага удаа	<input type="checkbox"/> Долоо хоногт 1-2 удаа	<input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа
--	--	---	--	--
 - e. Унтаж байх үеийн тайван бус байдалтай холбоотой өөр зүйлс байгаа бол бичнэ үү.
-
- | | | | | |
|--|--|---|--|--|
| | <input type="checkbox"/> Өнгөрсөн сарын хугацаанд огт тохиолдоогүй | <input type="checkbox"/> Долоо хоногт 1-ээс бага удаа | <input type="checkbox"/> Долоо хоногт 1-2 удаа | <input type="checkbox"/> Долоо хоногт 3 ба түүнээс дээш удаа |
|--|--|---|--|--|

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Судалгаанд хамрагдсан танд чин сэтгэлээсээ талархлаа!

SURVEY QUESTIONNAIRE

Please √ answer the question.

ID number:									
------------	--	--	--	--	--	--	--	--	--

General characteristics

1. Age: _____

2. Gender

- ① Female
- ② Male
- ③ Other

3. Place of residence

- ① Ger (yurt)
- ② House
- ③ Apartment
- ④ Other: /renting etc./ _____

4. What is your number of household member?

- ① Living alone
- ② Living with: _____ number of members

5. Do you have children? (0-18years old)

- ① Yes: _____ number of children
- ② No

6. How long it takes between home and work?

- ① Below 30mins
- ② 30-60mins
- ③ 1-2hours
- ④ Above 2hours

7. What is your education level?

- ① Diploma
- ② Bachelor
- ③ Master's degree and above

8. What is your current working department?

- ① OPD (Outpatient Department)
- ② IPD (Inpatient Department)
- ③ ICU (Intensive Care Unit)
- ④ ER (Emergency Room)
- ⑤ OR (Operation Room)
- ⑥ Other: _____

9. Are you directly taking care for COVID-19 patients or not?

- ① Yes -> _____ number of patients per day
- ② No

10. How many years of experience as a nurse? _____ years _____ months

11. How many years of experience at current hospital? _____ years _____ months

12. What was your total working hours in previous month? _____ hour _____ minutes

13. What is your family total income? _____ MNT

14. Are you smoking cigarettes?

- ① Yes -> _____ cigarettes per day
- ② No

15. Are you drinking alcohol?

- ① Yes -> _____ times per month
- ② No

16. Are you taking any medication or under treatment for sleeping disorder?

- ① Yes /please describe for how long etc.: _____
- ② No

Please answer the question with \surd check symbol.

N	Fear of COVID-19(FCV-19S)	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
1	I am most afraid of coronavirus-19.	①	②	③	④	⑤
2	It makes me uncomfortable to think about coronavirus-19.	①	②	③	④	⑤
3	My hands become clammy when I think about coronavirus-19.	①	②	③	④	⑤
4	I am afraid of losing my life because of coronavirus-19.	①	②	③	④	⑤
5	When watching news and stories about coronavirus-19 on social media, I become nervous or anxious.	①	②	③	④	⑤
6	I cannot sleep because I'm worrying about getting coronavirus-19.	①	②	③	④	⑤
7	My heart races or palpitates when I think about getting coronavirus-19.	①	②	③	④	⑤

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N	Impact of Event Scale (IES-6)	not at all	a little bit	moderately	quite a bit	extremely
1	I thought about it when I didn't mean to.	⊙	①	②	③	④
2	I felt watchful or on-guard.	⊙	①	②	③	④
3	Other things kept making me think about it.	⊙	①	②	③	④
4	I was aware that I still had lot of feelings about it, but I didn't deal with them.	⊙	①	②	③	④
5	I tried not to think about it.	⊙	①	②	③	④
6	I had trouble concentrating.	⊙	①	②	③	④

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Please read each statement and circle a number 1, 2, 3 or 4 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

N	The Depression Anxiety Stress Scale (DASS-21)	Did not apply to me at all	Applied to me to some degree, or some of the time	Applied to me to a considerable degree, or a good part of time	Applied to me very much, or most of the time
1	I found it hard to wind down ^(s)	○	①	②	③
2	I was aware of dryness of my mouth ^(a)	○	①	②	③
3	I couldn't seem to experience any positive feeling at all ^(d)	○	①	②	③
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion) ^(a)	○	①	②	③
5	I found it difficult to work up the initiative to do things ^(d)	○	①	②	③
6	I tended to over-react to situations ^(s)	○	①	②	③
7	I experienced trembling (eg, in the hands) ^(a)	○	①	②	③
8	I felt that I was using a lot of nervous energy ^(s)	○	①	②	③
9	I was worried about situations in which I might panic and make a fool of myself ^(a)	○	①	②	③
10	I felt that I had nothing to look forward to ^(d)	○	①	②	③
11	I found myself getting agitated ^(s)	○	①	②	③
12	I found it difficult to relax ^(s)	○	①	②	③
13	I felt down-hearted and blue ^(d)	○	①	②	③
14	I was intolerant of anything that kept me from getting on with what I was doing ^(s)	○	①	②	③
15	I felt I was close to panic ^(a)	○	①	②	③
16	I was unable to become enthusiastic about anything ^(d)	○	①	②	③
17	I felt I wasn't worth much as a person ^(d)	○	①	②	③
18	I felt that I was rather touchy ^(s)	○	①	②	③
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat) ^(a)	○	①	②	③
20	I felt scared without any good reason ^(a)	○	①	②	③
21	I felt that life was meaningless ^(d)	○	①	②	③

THE PITTSBURGH SLEEP QUALITY INDEX (PSQI)

Instructions: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer the questions.

1. During the past month, when have you usually gone to bed at night?
BED TIME _____
2. During the past month, how long (in minutes) has it usually take you to fall asleep each night?
NUMBER OF MINUTES _____
3. During the past month, what time have you usually gotten up in the morning?
GETTING UP TIME _____
4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spend in bed.)
HOURS OF SLEEP PER NIGHTH _____

For each of the remaining questions, check the one best response. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you...

a) Cannot get to sleep within 30 minutes	<input type="checkbox"/> Not during the past month	<input type="checkbox"/> Less than once a week	<input type="checkbox"/> Once or twice a week	<input type="checkbox"/> Three or more times a week
b) Wake up in the middle of the night or early morning	<input type="checkbox"/> Not during the past month	<input type="checkbox"/> Less than once a week	<input type="checkbox"/> Once or twice a week	<input type="checkbox"/> Three or more times a week
c) Have to get up to use the bathroom	<input type="checkbox"/> Not during the past month	<input type="checkbox"/> Less than once a week	<input type="checkbox"/> Once or twice a week	<input type="checkbox"/> Three or more times a week
d) Cannot breathe comfortably	<input type="checkbox"/> Not during the past month	<input type="checkbox"/> Less than once a week	<input type="checkbox"/> Once or twice a week	<input type="checkbox"/> Three or more times a week
e) Cough or snore loudly	<input type="checkbox"/> Not during the past month	<input type="checkbox"/> Less than once a week	<input type="checkbox"/> Once or twice a week	<input type="checkbox"/> Three or more times a week
f) Feel too cold	<input type="checkbox"/> Not during the past month	<input type="checkbox"/> Less than once a week	<input type="checkbox"/> Once or twice a week	<input type="checkbox"/> Three or more times a week
g) Feel too hot	<input type="checkbox"/> Not during the past month	<input type="checkbox"/> Less than once a week	<input type="checkbox"/> Once or twice a week	<input type="checkbox"/> Three or more times a week
h) Had bad dreams	<input type="checkbox"/> Not during the past month	<input type="checkbox"/> Less than once a week	<input type="checkbox"/> Once or twice a week	<input type="checkbox"/> Three or more times a week
i) Have pain	<input type="checkbox"/> Not during the past month	<input type="checkbox"/> Less than once a week	<input type="checkbox"/> Once or twice a week	<input type="checkbox"/> Three or more times a week
j) Other reason(s), please describe: _____				

How often during the past month have you had trouble sleeping because of this?

- Not during the past month | Less than once a week | Once or twice a week | Three or more times a week
6. During the past month, how would you rate your sleep quality overall?
 - Very good
 - Fairly good
 - Fairly bad
 - Very bad
 7. During the past month, how often have you taken medicine to help you sleep (prescribed or “over the counter”)?
 - Not during the past month | Less than once a week | Once or twice a week | Three or more times a week
 8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?
 - Not during the past month | Less than once a week | Once or twice a week | Three or more times a week
 9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?
 - No problem at all
 - Only a very slight problem
 - Somewhat of a problem
 - A very big problem
 10. Do you have a bed partner or roommate?
 - No bed partner or roommate
 - Partner/roommate in other room
 - Partner in same room, but not same bed
 - Partner in same bed

If you have a roommate or bed partner, ask him/her how often in the past month you have had...

- a. Loud snoring
 - Not during the past month | Less than once a week | Once or twice a week | Three or more times a week
- b. Long pauses between breaths while asleep
 - Not during the past month | Less than once a week | Once or twice a week | Three or more times a week
- c. Legs twitching or jerking while you sleep
 - Not during the past month | Less than once a week | Once or twice a week | Three or more times a week
- d. Episodes of disorientation or confusion during sleep
 - Not during the past month | Less than once a week | Once or twice a week | Three or more times a week
- e. Other restlessness while you sleep; please describe _____

-
- Not during the past month | Less than once a week | Once or twice a week | Three or more times a week

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Thank you very much for participating in the survey!

3. IRB Committee's approval

심의 승인서

연구책임자 (수신자)	성 명		소 속	직 위
	알탕체첵 몽흐토야		대학원 간호학과	석사
IRB No.	2-1041055-AB-N-01-2022-49			
연구 과제명	국 문	COVID-19 팬데믹 동안 몽골에서의 교대근무 간호사의 수면의 질에 영향을 미치는 요인		
	영 문	Factors affecting sleep quality of shift nurses in Mongolia during the COVID-19 pandemic		
심의종류	조건부(신속) → 조건부(신속) → 승인	심의일자	2022. 9. 20	
연구종류	<input checked="" type="checkbox"/> 인간대상연구		<input type="checkbox"/> 인체유래물 연구	
연구방법	<input type="checkbox"/> 실험/대조군 연구	<input type="checkbox"/> 코호트 연구	<input checked="" type="checkbox"/> 설문조사	
	<input type="checkbox"/> 면담조사	<input type="checkbox"/> 행동관찰	<input type="checkbox"/> 기타	
연구기간	2022년 9월 23일 ~ 2023년 9월 22일			
승인일(최초)	2022년 9월 23일			
연구승인기간	2022년 9월 23일 ~ 2023년 9월 22일			
심의의견				

- ※ 조선대학교 기관생명윤리위원회는 생명윤리 및 안전에 관한 법률과 관련 법규를 준수합니다.
- ※ 본 통보서에 기재된 사항은 조선대학교 기관생명윤리위원회에 기록된 내용과 일치함을 증명합니다.
- ※ 본 연구와 이해관계가 있는 위원이 있을 경우 해당 위원은 배제하였습니다.
- ※ 승인받은 설명문과 동의서는 기관생명윤리위원회 날인 후 사용해야 합니다.

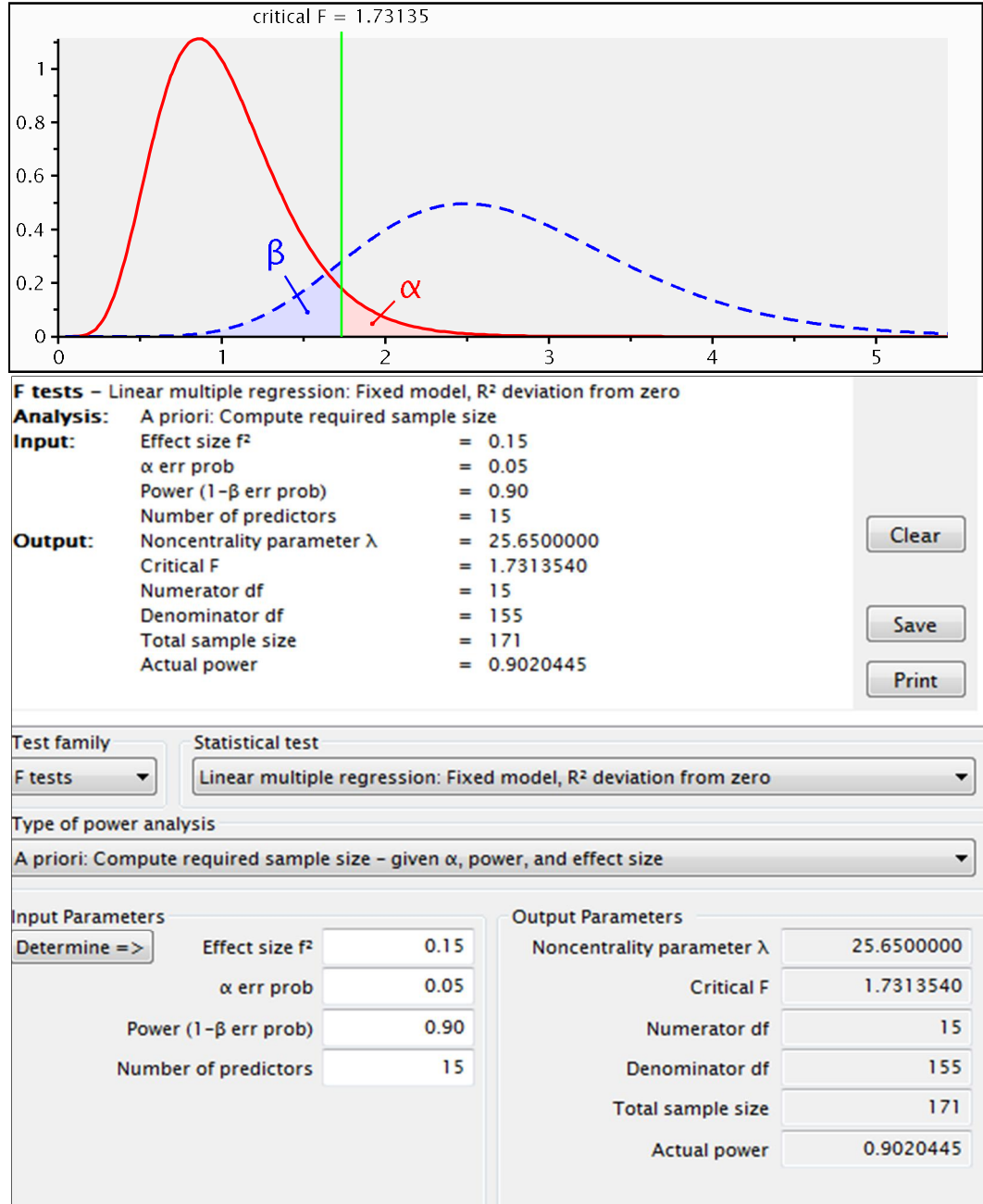
2022년 9월 23일

조선대학교 기관생명윤리위원회 위원장 (인)



4. Result table of sampling size calculation

Result table for calculating the number of samples using G*power 3.1.9.7 Program



5. Authorization for use of measurement tools

Request to use for measurement instrument: FCV-19 scale

Respected Mark D Griffiths

I, Munkhtuya Altantsetseg, am a graduate student from College of Medical at Chosun University in Korea. Currently, I am writing my master's dissertation, entitled "Factors affecting sleep quality of clinical nurses working at tertiary level hospitals in Mongolia during the COVID-19 pandemic", which will describe factors (fear of COVID-19 etc.) impacting sleep quality.

I am writing this letter to request you to kindly allow me to use the Fear of COVID-19 Scale (FCV-19S) questionnaire instrument in my research study. I would like to use and print your survey under the following conditions:

- I will use the surveys only for my research study and will not sell or use it with any compensated or curriculum development activities.

Our subjects are Mongolian nurses as mentioned above, the scale will be translated into Mongolian language. The Translation process will be handled by a clinical experienced nurse, who is fluent in English language.

If for some reason you do not own the copyright for the scale, I would appreciate any information you can provide concerning the proper person or company with whom I should inquire.

Thank you for your time and consideration of this request. I eagerly await your positive response.

Best regards,

A. Munkhtuya

Master Science of Nursing

Department of Nursing, Graduate School of Chosun University

No permission is needed to use the scale. It is in the public domain. Good luck with your research

Dr Mark Griffiths

Distinguished Professor of Behavioural Addiction

Request to use for measurement instrument: IE-6 scale

Respected Siri Thoresen

I, Munkhtuya Altantsetseg, am a graduate student from College of Medical at Chosun University in Korea. Currently, I am writing my master's dissertation, entitled "Factors affecting sleep quality of clinical nurses working at tertiary level hospitals in Mongolia during the COVID-19 pandemic", which will describe factors(posttraumatic stress reactions etc.) impacting sleep quality.

I am writing this letter to request you to kindly allow me to use the Impact of Event Scale-6 (IES-6) questionnaire instrument in my research study. I would like to use and print your survey under the following conditions:

- I will use the surveys only for my research study and will not sell or use it with any compensated or curriculum development activities.

Our subjects are Mongolian nurses as mentioned above, the scale will be translated into Mongolian language. The Translation process will be handled by a clinical experienced nurse, who is fluent in English language.

If for some reason you do not own the copyright for the scale, I would appreciate any information you can provide concerning the proper person or company with whom I should inquire.

Thank you for your time and consideration of this request. I eagerly await your positive response.

Best regards,

A.Munkhtuya

Master Science of Nursing

Department of Nursing, Graduate School of Chosun University

Dear Munkhtuya Altantsetseg,

The Impact of Event Scale-6 is freely available, and no permission is needed to use the scale. The same is the case for the original IES and the IES-R.

Good luck with your work,

kind regards,

Siri

Siri Thoresen

Norwegian Centre for Violence and Traumatic Stress Studies

Request to use for measurement instrument: DASS-21 scale

Respected Lovibond

I, Munkhtuya Altantsetseg, am a graduate student from College of Medical at Chosun University in Korea. Currently, I am writing my master's dissertation, entitled "Factors affecting sleep quality of clinical nurses working at tertiary level hospitals in Mongolia during the COVID-19 pandemic", which will describe factors(depression, anxiety, stress etc.) impacting sleep quality.

I am writing this letter to request you to kindly allow me to use the Depression Anxiety Stress Scale - 21 (DASS-21) questionnaire instrument 'Mongolian version' in my research study. I would like to use and print your survey under the following conditions:

- I will use the surveys only for my research study and will not sell or use it with any compensated or curriculum development activities.

If for some reason you do not own the copyright for the scale, I would appreciate any information you can provide concerning the proper person or company with whom I should inquire.

Thank you for your time and consideration of this request. I eagerly await your positive response.

Best regards,

A.Munkhtuya

Master Science of Nursing

Department of Nursing, Graduate School of Chosun University

Dear Munkhtuya,

You are welcome to use the DASS in your research. You can download the questionnaires (including a Mongolian translation) and scoring key from the DASS website www.nsv.unsw.edu.au/dass/. Please also see the FAQ page on the website for further information.

Best regards,

Peter Lovibond

Request to use for measurement instrument: PSQI

Respected Daniel J. Buysse

I, Munkhtuya Altantsetseg, am a graduate student from College of Medical at Chosun University in Korea. Currently, I am writing my master's dissertation, entitled "Factors affecting sleep quality of clinical nurses working at tertiary level hospitals in Mongolia during the COVID-19 pandemic", which will describe factors impacting sleep quality.

I am writing this letter to request you to kindly allow me to use The Pittsburg Sleep Quality Index (PSQI) questionnaire instrument in my research study. I would like to use and print your survey under the following conditions:

- I will use the surveys only for my research study and will not sell or use it with any compensated or curriculum development activities.

Our subjects are Mongolian nurses as mentioned above, the scale will be translated into Mongolian language. The Translation process will be handled by a clinical experienced nurse, who is fluent in English language.

If for some reason you do not own the copyright for the scale, I would appreciate any information you can provide concerning the proper person or company with whom I should inquire.

Thank you for your time and consideration of this request. I eagerly await your positive response.

Best regards,

A. Munkhtuya

Master Science of Nursing

Department of Nursing, Graduate School of Chosun University

Sent on behalf of Carolyn Weber

Research use of the PSQI:

Dear Munkhtuya Altantsetseg,

Thank you for your interest in our PSQI instrument. I can give you permission to use the PSQI **only** in non-commercially funded research or education or the product or service you are testing is not a commercial product or is in development by a commercial entity. It cannot be used for patient care either. If your use does **not** fall under those conditions, you can use the survey according to the following provisions:

This copyright in this form is owned by the University of Pittsburgh and may be reprinted without charge **only** for non-commercial research and educational purposes. You may not make changes or modifications of this form without prior written permission from the University of Pittsburgh. If you would like to use this instrument for commercial purposes or for commercially sponsored research, please contact the Innovation Institute at the University of Pittsburgh at 412-383-7669 for licensing information.

Our university has instituted a new policy for foreign licensing entities. There are additional clauses that are added to these agreements. Due to this added language, the agreement now needs routed through several departments at the university for review and approval first before final execution of the agreement.

The information is found on the Sleep Medicine Institute of the University of Pittsburgh as <https://www.sleep.pitt.edu/instruments/>.

All publications, presentations, reports, or developments resulting from or relative to the use of this material shall be referenced as follows: The Pittsburgh Sleep Quality Index: A New Instrument for Psychiatric Practice and Research (Authors Daniel J. Buysse, Charles F. Reynolds III, Timothy H. Monk, Susan R. Berman, and David J. Kupfer, © University of Pittsburgh 1989)

There would need to be a separate agreement if you were going to use an electronic delivery of the survey format. We do not have the PSQI available in an electronic format, that will need to be explored by the research institution licensee. This process will take additional time if used in this fashion as we need to do a formal license agreement. Attached is the license agreement for the electronic use of the PSQI. If there is a third party vendor who codes the survey instrument, they will also need to acknowledge and sign the agreement. Mobile apps are acceptable only if distributed to a select patient population and not widely available on the mobile app sites for general download. These mobile apps will need to be removed from the site after the study. This will be expressly monitored for violations.

I will also need the **researcher and someone who has signatory authority for your institution sign this agreement.** This signatory person is generally not a faculty member or dean, but rather someone who has the authority to bind the institution to the terms of the agreement. It is usually someone in your Office of Research or Technology Transfer Office. We do not accept electronic or digital signatures. We require the original signed copy to be scanned, pdf'd and then emailed back to us for final execution. We cannot accept electronic or digital signatures. You will need to sign in ink, scan, pdf and then email the signed agreement back to the university. We will accept DocuSign signatures.

Translations are distributed through an agreement that we have with MAPI Research Trust. The website (<https://enprovide.mapi-trust.org/>) will indicate what languages they have on file. You will need to work with them to obtain any necessary translations. They will collect the proper user agreement. I do not know if they have the required translation on file. You will need to contact them for that information.

If the translations are unavailable, MAPI will be able to provide them for a cost. You will need to contact them for the exact price. If you translate yourself, there may be repercussions to your study in that the translations must be done in a validated linguistic manner which MAPI provides to us. If the translation is not done correctly, the results may not be valid. All translations are property of the University of Pittsburgh. They are considered derivative works of the original work. I have attached a template translation agreement which needs to be completed if you do the translation yourself.

For research and/or educational purposes, Pitt does not require a signed license agreement as long as you comply with the above provisions. MAPI, however, does and you need to send it directly to them as per their instructions.

If you have any questions, please feel free to email me for additional information.

Thank you,

Carolyn

*Carolyn J. Weber, MBA
Licensing Associate*

6. Content Validity Index

Respected Experts,

I, Munkhtuya Altantsetseg, am a graduate student from College of Medical at Chosun University in Korea. Currently, I am writing my master's dissertation, entitled "Factors affecting sleep quality of clinical nurses working at tertiary level hospitals in Mongolia during the COVID-19 pandemic", which will describe factors impacting sleep quality.

We received the official approval from the owner of the instruments. Our subjects are Mongolian nurses as mentioned above, the 3 scales were needed to translate into Mongolian language. We followed the guideline and instruction of WHO-Process of translation and adaptation of instruments. Those instruments are:

1. Fear of COVID-19 Scale (FCV-19) (English version - translated into Mongolian language) (7 items)
2. Impact of Event Scale (IES-6) (English version - translated into Mongolian language) (6 items)
3. DASS-21 (Mongolian version) (21 items)
4. The Pittsburgh Sleep Quality Index (PSQI) (English version - translated into Mongolian language) (10 items)

We need your expert judgement on the degree of relevance of each item to the measured domains. Your review should be based on the definition and relevant terminologies that are provided to you. Please be as objective and constructive as possible in your review and use the following rating scale. (please find the attached files)

I am writing this letter to request you to kindly cooperate with our study Content Validity Index experts' judgement. Thank you for your time and consideration of this request. I eagerly await your positive response.

Best regards,
A.Munkhtuya

7. Research participating institution approval

Research Participating Institution Approval

Судалгаанд оролцох байгууллагын зөвшөөрөл

Receiver: For Chosun University Institutional Review Board Permission

1. Research name (English): Factors affecting sleep quality of clinical nurses working at tertiary level hospitals in Mongolia during COVID-19 pandemic

Судалгааны сэдэв (Монгол): Ковид-19 цар тахлын үед Монгол улсын гуравдугаар шатлалын эмнэлэгт ажиллаж буй сувилагч нарын нойрны чанарт нөлөөлж буй хүчин зүйлсийг судлах нь

2. Researcher name and title:

Altantsetseg Munkhtuya, Master Science of Nursing student,
Nursing Department, College of Medicine, Chosun University

Судлаачийн нэр, албан байгууллага:

Алтанцэцэг Мөнхтуяа, Сувилахуйн ухааны магистрант,
Анагаах Ухааны Коллеж, Чусонь Их Сургууль

[Participating organization name: The First Central Hospital, Mongolia]

[Судалгаанд оролцох байгууллага: Улсын Нэгдүгээр Төв Эмнэлэг]

3. Research design and method of participating institutions:

A cross-sectional study method will be used to determine the factors affecting sleep quality of clinical nurses in Mongolia during the COVID-19 pandemic. The study will be conducted from 222 nurses and performed among clinical nurses who agreed to voluntarily participate in this study.

Судалгааны загвар болон хамрах хүрээ: Ковид-19 цар тахлын үед Монгол улсын гуравдугаар шатлалын эмнэлэгт ажиллаж буй сувилагч нарын нойрны чанарт нөлөөлж буй хүчин зүйлсийг нэг агшингийн асуумж судалгааны аргыг ашиглан тодорхойлоход оршино. Судалгаанд нийт 222 сувилагчийг хамруулах ба тус эмнэлгээс судалгаанд оролцох сувилагч нар нь судалгааны танилцуулгыг сайтар уншиж танилцан, судалгаанд оролцохыг зөвшөөрсөн байх ба сайн дурын

оролцоотой хамрагдана.

4. Cooperation of this organization:

In this study, Ethics Committee or Director of Hospital, and Head of Nursing Department will be asked to cooperate and permission to conduct studies, also collecting data processing will be conducted after the approval from the hospital.

Энэхүү судалгаанд тус эмнэлгийн Био Ёс Зүйн Хороо эсхүл Эмнэлгийн Дарга болон Сувилахуйн Албаны Дарга нарт хамтран ажиллах, судалгааг явуулах зөвшөөрлийн хүсэлтийг илгээж, судалгааны зөвшөөрөл олгогдсоны үндсэн дээр судалгааг явуулна.

5. Total research period: [current year of research: 2022]

The study duration estimated by 6 months from date of approval IRB, Chosun University.


Судалгаа хийгдэх хугацаа нь Чусонь Их Сургуулийн Био Ёс Зүйн Хорооны зөвшөөрөл олгогдсоноос хойш нийт 6 сарын дотор хийж гүйцэтгэхээр төлөвлөсөн.


Additionally, Research proposal summary, Research statement and Research participate consent form is attached.

Судалгааны хураангуй Судалгааны танилцуулга болон Судалгаанд оролцох зөвшөөрлийн хуудас нь хавсралтаар илгээсэн болно.

We inform you, the hospital provided permission to conduct the above study.

Тус эмнэлэг нь дээрх судалгааны ажлыг явуулах зөвшөөрөл олгосныг мэдэгдэж байна.


 Ethics Committee/Director of Hospital (Date: _____)
 Ёс Зүйн Хорооны Дарга/Эмнэлгийн Дарга


 Head of Nursing Department (Date: _____)
 Сувилахуйн Албаны Дарга

Research Participating Institution Approval

Судалгаанд оролцох байгууллагын зөвшөөрөл

Receiver: For Chosun University Institutional Review Board Permission

1. Research name (English): Factors affecting sleep quality of clinical nurses working at tertiary level hospitals in Mongolia during COVID-19 pandemic

Судалгааны сэдэв (Монгол): Ковид-19 цар тахлын үед Монгол улсын гуравдугаар шатлалын эмнэлэгт ажиллаж буй сувилагч нарын нойрны чанарт нөлөөлж буй хүчин зүйлсийг судлах нь

2. Researcher name and title:

Altantsetseg Munkhtuya, Master Science of Nursing student,
Nursing Department, College of Medicine, Chosun University

Судлаачийн нэр, албан байгууллага:

Алтанцэцэг Мөнхтуяа, Сувилахуйн ухааны магистрант,
Анагаах Ухааны Коллеж, Чусонь Их Сургууль

[Participating organization name: National Center of Communicable Disease]

[Судалгаанд оролцох байгууллага: Халдварт Өвчин Судлалын Үндэсний Төв]

3. Research design and method of participating institutions:

A cross-sectional study method will be used to determine the factors affecting sleep quality of clinical nurses in Mongolia during the COVID-19 pandemic. The study will be conducted from 222 nurses and performed among clinical nurses who agreed to voluntarily participate in this study.

Судалгааны загвар болон хамрах хүрээ: Ковид-19 цар тахлын үед Монгол улсын гуравдугаар шатлалын эмнэлэгт ажиллаж буй сувилагч нарын нойрны чанарт нөлөөлж буй хүчин зүйлсийг нэг агшингийн асуумж судалгааны аргыг ашиглан тодорхойлоход оршино. Судалгаанд нийт 222 сувилагчийг хамруулах ба тус эмнэлгээс судалгаанд оролцох сувилагч нар нь судалгааны танилцуулгыг сайтар уншиж танилцан, судалгаанд оролцохыг зөвшөөрсөн байх ба сайн дурын

оролцоотой хамрагдана.

4. Cooperation of this organization:

In this study, Ethics Committee or Director of Hospital, and Head of Nursing Department will be asked to cooperate and permission to conduct studies, also collecting data processing will be conducted after the approval from the hospital.

Энэхүү судалгаанд тус эмнэлгийн Био Ёс Зүйн Хороо эсхүл Эмнэлгийн Дарга болон Сувилахуйн Албаны Дарга нарт хамтран ажиллах, судалгааг явуулах зөвшөөрлийн хүсэлтийг илгээж, судалгааны зөвшөөрөл олгогдсоны үндсэн дээр судалгааг явуулна.

5. Total research period: [current year of research: 2022]

The study duration estimated by 6 months from date of approval IRB, Chosun University.

Судалгаа хийгдэх хугацаа нь Чусонь Их Сургуулийн Био Ёс Зүйн Хорооны зөвшөөрөл олгогдсоноос хойш нийт 6 сарын дотор хийж гүйцэтгэхээр төлөвлөсөн.

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_____ Ethics Committee/Director of Hospital (Date: _____)
Ёс Зүйн Хорооны Дарга/Эмнэлгийн Дарга

_____ Head of Nursing Department (Date: _____)
Сувилахуйн Албаны Дарга



8. Abbreviations

COVID-19	Coronavirus Disease 2019
CVI	Content Validity Index
DASS-21	Depression Anxiety Stress Scale-21
FCV-19S	Fear of COVID-19 Scale
IES-6	Impact of Event Scale-6
IRB	Institutional Review Board
PTSD	Post-Traumatic Stress Disorder
SARS-CoV-2	Severe Acute Respiratory Syndrome-Coronavirus-2
PSQI	The Pittsburgh Sleep Quality Index
WHO	World Health Organization
MNT	Mongolian Tugrug