

Levels of Stress and Coping Mechanisms among the Maintenance Workers of Government Hospitals in Tuguegarao City Catering COVID-19

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Abstract—Hospitals were among the most affected establishments in society during the COVID-19 pandemic. The number of COVID-19 cases and the fast spread of the disease create a healthcare burden and tremendous demand for hospitals worldwide. Maintenance workers fall into high-risk groups because of their extensive exposure to COVID-19 patients at the hospital. This workload and risk among maintenance workers generate emotional exhaustion, depersonalization, and a low sense of personal accomplishment, potentially leading to burnout. This study focused on maintenance workers' stress level and coping mechanisms. This study then utilized a descriptive quantitative research design to determine the respondents' stress levels, stress-related factors, and coping mechanisms. Maintenance workers who work per shift at Government Hospitals in Tuguegarao City, Cagayan, were included and were randomly chosen through stratified random sampling. The researchers used two adopted questionnaires, the Brief Cope and the Perceived Stress Questionnaire. Results showed that these workers are experiencing moderate stress and utilize emotion-focused coping. There is a significant difference in the stress levels of respondents in terms of when grouped according to sex, age, and religion. It also suggests a significant association between their stress levels and coping mechanisms.

Keywords— COVID-19 pandemic, levels of stress, coping mechanisms, maintenance workers

I. INTRODUCTION

Hospitals were among the most affected establishments in society during the COVID-19 pandemic. The number of COVID-19 cases and the spread of the disease create a healthcare burden and demand for hospitals worldwide (Willan et al., 2020). The increased workload of healthcare personnel caused by the COVID-19 pandemic impacts the job performance of hospital workers, causes medical mistakes, leads to patient death, and is a serious worry for all healthcare organizations (Pourteimour et al., 2021). As the health crisis continues, the need for adequate service delivery is emphasized as institutions see the need for the maintenance of hospital facilities (Mwanza & Mbohwa, 2015).

Known as nonclinical staff members in a hospital setting, maintenance workers perform maintenance, janitorial and patient transport functions, security guards, and others in roles that do not directly provide clinical care (Maurer et al., 2020). Moreover, they are responsible for maintaining disinfection, waste disposal, sampling, and support staff. In particular, security guards play a vital role in keeping a relaxed environment in a hospital by protecting its critical assets – its people, property, information, and reputation (Rinkoo et al., 2013). In reality, for most public health facilities, maintenance workers perform the same activity as nursing assistants (Giurgiu & Bardac, 2013). Overall, maintenance workers are the employees who help the hospital achieve its aim of excellence in healthcare and public service by maintaining a safe physical environment and providing associated services (Michigan Medicine, 2022).

On the other hand, government hospitals employ more maintenance employees to do more preventative maintenance and have a more ordered operating system in order to provide better service. Their work is best shown when they have been found to likely reduce contamination and improve infection control in hospitals (Shobo, 2022). However, despite evidence showing the workload they have and the risk of life-threatening sickness they take, their job is still being overlooked and underappreciated (Tyan & Cohen, 2020).

The primary stressful events associated with being at risk of infection by SARS-CoV-2 may be universal for all hospital employees. Among the numerous stressors associated with the COVID-19 outbreak, the primary concern of the FHCWs was safety. Research conducted by Zare et al. (2021) and Esmaeili et al. (2020) found that a high workload, a slow response time during peak hospital visits, a lack of adequate support from top managers across all job groups, a lack of access to sufficient personal protective equipment, and managers and staffs' unpreparedness to respond to critical emergencies all influenced participants' stress levels. Additionally, healthcare workers are concerned about contracting an infection due to inadequate personal protective equipment and long work hours and infecting their families. Distress can also be exacerbated by

fears of reduced income due to job loss and social stigma associated with infection (Zare et al., 2021).

During the pandemic, stress is unavoidable for those who work with patients diagnosed with Covid-19, such as physicians and nurses, and maintenance workers working near or in COVID-19 wards. It is known that even if a person can adjust, they will most likely experience stress, even if it is just short-term distress. People negotiate periods of transition, trauma, challenges, and loss, and they can also experience stress. When people experience anxiety, coping mechanisms help to manage painful or difficult emotions. Coping mechanisms allow people to adjust to stressful events, especially during this pandemic. Types of coping mechanisms like support, relaxation, problem-solving, humor, and physical activity are also mentioned. Practical coping skills of a person help to improve the mental and emotional health of the people. And if maintenance workers are doing these coping mechanisms, there is a greater chance that the stress they are experiencing will decrease and can be managed independently. The ones who can adjust to stressful situations will be less likely to experience stress and other mental health concerns.

Nonclinical health care professionals' needs must also be prioritized (Maurer et al., 2020). Among other healthcare providers in hospitals in the Philippines, maintenance workers, particularly janitorial staff, were deemed directly and constantly involved in producing, storing, and transporting hazardous wastes (Pagkatipunon, 2014). With this nature of their work and being alongside health care providers, maintenance workers fall into high-risk groups because of their extensive exposure to COVID-19 patients at the hospital (Maurer et al., 2020; Pinarlik et al., 2021). This workload and risk among maintenance workers generate emotional exhaustion, depersonalization, and a low sense of personal accomplishment, potentially leading to burnout (Hayes et al., 2020).

Moreover, nonclinical hospital personnel presented the highest coronavirus anxiety scale scores among hospital workers (Garcia-Reyna et al., 2022). Due to this, reducing stress and anxiety and increasing positive feelings in a stressful environment have been part of the coping mechanisms of all workers in the medical field (Beh & Loo, 2012). Therefore, the need to look into the stress level of maintenance workers in COVID-19 wards and how they cope with it is necessary as the results will allow government agencies to form policies for their benefit, all possible through research.

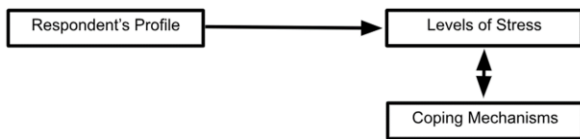


Fig. 1. The effect of COVID-19 Factors associated with stress and Respondent's Profile to their Levels of Stress and its effect on the Coping Mechanism of the respondents.

The research paradigm shows how the Respondent's profile contributes to the respondents' stress levels. These include their socio-demographics, employment profile, and health profile which may lead to the development of stress. It also shows the

association between stress levels and the respondents' coping mechanisms.

II. METHODS

A. Research Design

This study utilized a descriptive quantitative research design that enabled the researchers to describe the respondents' level of stress, factors related to stress and their coping mechanisms.

B. Locale and Respondents

The researchers conducted the study in two government hospitals in Tuguegarao City. Hospital A is a Level 3 teaching, training, and research hospital in Region 2. Hospital B, on the other hand, is a Level 2 hospital run by the Local Government Unit of Tuguegarao City. Both Hospital A and B are few hospitals that cater to patients with COVID-19 during this pandemic regardless of sociodemographic barriers. This study included 63 workers performing maintenance, janitorial functions, and security guards that do not directly provide clinical care. Excluded in the participant's pool are on-call maintenance workers who do not work per shift.

C. Instrument

The researchers used two adopted questionnaires to gather information for this study's main data-gathering instrument. The first questionnaire is the Perceived Stress Questionnaire (PSQ) which consists of 29-item questions developed by Levenstein et al (1993) to assess the stressful life events and circumstances that tend to trigger or exacerbate disease symptoms. Each item is rated on a four-point Likert scale ranging from 1 ("almost never") to 4 ("usually"), indicating how frequently they experience certain stress-related feelings. A total score is found by tallying each item (questions 1,7,10,13,17,21,25, and 29 are positive and are scored according to the directions accompanying the scale). A PSQ index can be found by subtracting 30 from the raw score and dividing the results by 90, yielding a score between 0 and 1. Developers Levenstein et al (1993) conducted a psychometric evaluation of the scale and found an internal consistency ranging from 90 to .92 and test-retest reliability of .82.

The second questionnaire is the BRIEF COPE developed by Carver (1997) to assess a broad range of coping responses. The questionnaire consists of 28 items that measure 14 factors of 2 items each, which correspond to a Likert scale ranging from 0 = I have not been doing this at all to 4 = I have been doing this a lot. Scores are presented for three overarching coping styles (problem-focused, emotional-focused, and avoidant coping) as average scores. The scoring is done by taking the sum of item scores divided by the number of items indicating the degree to which the respondents have been engaging in that coping style. Both questionnaires were also translated into Filipino for further understanding of the participants.

D. Data Analysis

The gathered data was analyzed through the use of Statistical Package for Social Sciences (SPSS) version 2.0. The researchers tabulated the gathered data and used several statistical analyses to interpret numerical data as gathered from

the participants. The researchers used frequency count to determine the total number and percentages for the demographic profile of the respondents. Frequencies and Percentages were used to get the coping mechanism of the respondents. Mean was utilized in assessing the level of stress of the respondents and it was interpreted using the table below.

TABLE I. QUALITATIVE INTERPRETATION FOR MEAN SCORE VALUES

Mean Score Range	Qualitative Interpretation
<0.34	Low Stress
0.34- 0.46	Moderate Stress
>0.46	High Stress

The researchers utilized T-test and ANOVA to determine the significant difference of the occupational stress level to the different demographic profiles of the respondents. Chi-square was used to determine the significant association of the coping mechanism to the level of occupational stress of the respondents.

E. Ethical Considerations

Before the study was conducted, the researchers sought approval from the university and the hospitals where data collection will be conducted. Informed consent was sought from the respondents. Voluntary participation and the right to withdrawal of the respondents were ensured. The information gathered was kept private and was only used for this study. The respondent's information was deleted at the end of the data collection procedure, and questionnaires were burned after the conduct of the study. This was done to protect the respondents' privacy and security. The results were tallied correctly, checked, and analyzed, ensuring quality information was obtained. The study was carried out with integrity, resulting in reliable, consistent, accurate, and unbiased data.

III. RESULTS AND DISCUSSION

TABLE II. SOCIO-DEMOGRAPHIC PROFILE OF MAINTENANCE WORKERS

Variable	Categories	Frequency (n=63)	Percentage
Sex	Male	49	77.8
	Female	14	22.2
Age	25 and below	3	4.8
	26-30	20	31.7
	31-35	19	30.2
	36-40	10	15.9
	41-45	7	11.1
	46-50	2	3.2
Marital Status	51 and above	2	3.2
	Single	19	30.2
	Married	37	58.7
	Widowed	5	7.9
Religion	Seperated	2	3.2
	Roman Catholic	61	96.8
	Iglesia ni Cristo	1	1.6
Educational Attainment	Jehovah's Witness	1	1.6
	Elementary	1	1.6
	High School	30	47.6
	Technical Vocation	16	25.4
	College Graduate	5	7.9
Living Arrangement	Other	11	17.5
	Living with Family	58	92.1
Family Size	Not Living with Family	5	7.9
	2	8	12.7
Family Size	3	23	36.5
	4	14	22.2
	5	16	25.4
	Others	2	3.2

Table II shows the socio-demographic profile of the maintenance workers. Most of the respondents are male with 49 respondents. Majority of the maintenance workers come from the age range 26 to 30, while more than 50% of them are married. Roman Catholicism is the dominant religion among the respondents and more than 25% of the respondents are high school graduates. Fifty-eight of them are living with their family with the most respondents coming from a family of three.

TABLE III. EMPLOYMENT PROFILE OF MAINTENANCE WORKERS

Variable	Categories	Frequency (n=63)	Percentage
Employment Status	Permanent	13	20.6
	Casual	9	14.3
	Job Order	17	27.0
	Contractual	24	38.1
Years in Service	1-7	47	74.6
	8-14	16	25.4
Job Description	Janitor	46	73.0
	Security Staff	17	27.0

Table III shows the employment profile of maintenance workers. The majority of the maintenance workers are contractual janitors and most have been in service for 1 to 7 years. Almost all of them have an annual income between 70,000 to 100,000 pesos and all of them are working 8 hour shifts per day.

TABLE IV. HEALTH PROFILE OF MAINTENANCE WORKERS

Variable	Categories	Frequency (n=63)	Percentage
Lifestyle Related Vices	Smoking	9	14.3
	Drinking Alcohol	30	47.6
	None	18	28.6
	Both	6	9.5
Presence of Comorbidity	Hypertension	24	38.1
	None	38	60.3
	Diabetes Mellitus Type 2	1	1.6

Table IV shows the health profile of the maintenance workers. Most of them drink alcohol and have no comorbidity. It is also worthy to note that more than 25% of them suffer from hypertension.

TABLE V. LEVEL OF STRESS AND TYPE OF COPING MECHANISMS OF MAINTENANCE WORKERS

Variable	Categories	Frequency (n=63)	Percentage
Level of Stress	Low Stress	21	33.33
	Moderate Stress	34	53.97
	High Stress	8	12.70
Type of Coping Mechanisms	Problem-Focused Coping	18	28.60
	Emotional-Focused Coping	24	38.10
	Avoidant Coping	21	33.00

The table above shows that the majority of maintenance workers have low to moderate levels of stress during the COVID-19 pandemic. Moreover, a greater percentage of the maintenance workers use emotion-focused coping followed by avoidant type of coping when dealing with stress during the pandemic.

During the pandemic, these workers worked alongside health care providers and their extensive exposure to COVID-19 patients pushed them to be part of high-risk groups (Maurer et al., 2020; Pinarlik et al., 2021). With the increasing number of COVID-19 cases and the fast spread of the disease create a healthcare burden and huge amount of demand for hospitals around the world (Willan et al., 2020). It has been stated on previous researches that COVID-19 indeed causes

psychological effects such as anxiety among hospital workers (Ahmed et al., 2020; Bao et al., 2020; Deng & Peng, 2020; Jiao et al., 2020; Lai et al., 2020; Shigemura et al., 2020). The study revealed that maintenance workers are experiencing different levels of stress in their workplace. On average, it showed that they have a moderate level of stress which could be attributed with the slowly decreasing number of COVID-19 patients in the city. This result parallels with a previous study which presented that there is an anxiety among nonclinical hospital workers (Garcia-Reyna et al., 2022). Furthermore, janitors were found to have an association between high or low stress and depression (Mahfoudh et al., 2021). However, it was also explained that workers on health-related establishments have a higher risk for mental health (Lai et al., 2020; Tan et al., 2020).

Due to their physical and mental workloads, moderate stress is seen among janitors (Schwartz et al., 2020). The current study also showed that maintenance workers often feel discouraged, mentally exhausted, and have trouble relaxing in their respective working environments. These altogether are accompanied by the amount of work they have to endure every day. In particular, they are pressured with the demands of their work, time pressure, and doubled responsibility. The anxiety among maintenance workers is found when they are worried, and frustrated. These findings are backed up with studies as the fear of infection, added workload, and little social support contributed to the anxiety of these workers (Lai et al., 2020). Studies have detected that the COVID-19 is generating psychological symptoms in the general population (Altena et al., 2020; Asmundson & Taylor, 2020; Gao J. et al., 2020; Sani et al., 2020; Wang et al., 2020). Moreover, the knowledge on the rapid spread of the newly-discovered disease and being exposed to the virus intensifies this aspect of their mental health (Gao et al., 2020; Lai et al., 2020; Wang et al., 2020). The same with the study of Fried and Fisher (2016), which asserted employees with less experience have a higher level of stress and burnout related to work. Overall, these results imply that the presence of stress among maintenance workers are evident as numerous factors affect how their level of stress is shown.

Being deemed as directly and constantly involved in the production, storage, and transport of hazardous wastes, the needs of maintenance workers must also be prioritized (Pagkatipunan, 2014; Maurer et al., 2020). Coping mechanisms on the workplace help workers in combatting anxiety and stress in their respective workplace. In a hospital setting, reducing stress and anxiety, and increasing positive feelings under stressful environments has been part of the coping mechanisms of all workers in the medical field (Beh & Loo, 2012). The results of the study agree as it portrayed that the majority of maintenance workers use emotion-focused coping strategies as their coping mechanism against stress. Getting emotional support from others, receiving help and advice, and trying to be more positive were one of the specific ways that were observed to maintenance workers. Moreover, they also like expressing negative feelings, and getting comfort and understanding from someone as part of their emotion-focused coping strategy. This result coincides with a previous study which revealed that emotions and perceived stressors were part of coping mechanisms and motivators of hospital staff as it reduces their stress (Rose et al., 2021). It has also been found that there is

personal growth among people in the hospital who utilize emotional-focused coping strategies (Brusletto et al., 2018). This means that in the health environment, patients, healthcare providers, and staff are benefitting with this type of coping mechanism.

However, there are maintenance workers who prefer other coping strategies that help them in reducing stress in their workplace. In the present study, it revealed that the second choice was avoidant coping. It was found that maintenance workers see the need to avoid stress by distracting themselves with leisure activities such as going to movies, watching TV, sleeping or shopping. Meanwhile, there are those who are not recognizing the stress that they are dealing with by thinking such aren't real. This result coincides with a previous study that found out that non-health care workers suggested avoiding anxious thoughts and feelings and continued to work. They see that by doing so, it reduces their stress and help them sleep and relax (Romate & Rajkumar, 2022). This means that with a lot of workload, these workers tend to just avoid and ignore the stress they are experiencing as they see it as only a hindrance to their work.

Lastly, 28.6% of maintenance workers prefer problem-focused coping strategies. For them, it is necessary to concentrate on finding solutions and strategies that would allow them to cope with the stress they are dealing with. In contrast with avoidant coping, these people choose to accept the presence of stress as they think hard about the proper steps to take in order to resolve it. Another study agrees with this result as it found out that active problem-focused coping strategies have been encouraged because they are considered to be more beneficial than passive emotion-focused strategies (Tuncay & Mubasak, 2015). For health-related workers and hospital staff, it was observed as well that problem-focused coping is generally considered more effective (Burke Draucker, 2019). These results mean that workers have different preferences with respect to how they cope with the stress that their work brings.

TABLE VI. DIFFERENCE IN THE LEVEL OF STRESS OF MAINTENANCE WORKERS WHEN GROUPED ACCORDING TO PROFILE VARIABLES

Variable	t/F-value	p-value	Decision
Sex	12.107	.001*	Reject Ho
Age	4.153	.002*	Reject Ho
Civil status	1.707	.175	Accept Ho
Religion	3.8638	.026*	Reject Ho
Educational attainment	1.427	.176	Accept Ho
Living Arrangement	.001	.982	Accept Ho
Family size	1.135	.342	Accept Ho
Employment status	6.224	.001*	Reject Ho
Years in service	2.147	.036*	Reject Ho
Job description	1.538	.129	Accept Ho
Lifestyle-related vices	1.175	.327	Accept Ho
Presence of comorbidity	3.099	.052	Accept Ho

* SIGNIFICANT AT 0.05 LEVEL

The table shows that there is a significant difference in the stress level of the maintenance workers when grouped according to their sex, age, religion, employment status and years in service. Male maintenance workers were found to have higher stress levels than females. Higher stress levels are observed among maintenance workers aged 25 and below compared to those aged 26-30 and 36-40. Moreover, the maintenance workers in a contractual status have a higher level of stress than those in a permanent or causal status.

Results from this study showed that there is a significant difference in the stress levels of maintenance workers when grouped according to their socio-demographic profile. Specifically, there's a difference in the stress levels when grouped according to their sex, age, and religion. A study backs this result as it found gender and age having a significant difference in occupational injury including stress among maintenance workers (Smith & Anderson, 2017; Green et al., 2019).

For age, the current study revealed that higher stress levels were observed in ages 25 and below when compared to ages 31 and above. Meanwhile, ages 26 to 30 were seen to have higher stress levels compared to maintenance workers whose age ranges from 36 to 40. It has been proven that stress level of workers in hospitals varies depending on their age (Chou et al., 2014; Mosadeghrad, 2013; Ozamiz-Etxebarria et al., 2020). It was stressed that age is a contributing factor to their stress on their work environment and workload in general (Ream et al., 2016). The result shown in the current study is in parallel with a former study that indicates how age is one of the contributors on the exposure of stress among hospital janitor occupations (Giurgiu et al., 2013). A study by Gorji et al. (2013), also backs this up by finding out that younger hospital workers have higher stress levels. However, another study states that maintenance workers who's aged more than 40 or under had a higher proportion of poor work performance but sees age to have no association with their stress level (Tangchareonsamut et al., 2021). Overall, these results and findings from previous studies mean that age plays a role in the level of stress among maintenance workers of hospitals.

For gender or sex, the current study found that this has a significant difference to the stress level of maintenance workers. Women or females have been found to have higher stress levels (Gorji et al., 2013). The same was stated in a previous study that sees women janitors having a significantly increased stress (Anderson et al., 2022). Female workers have higher stress levels because of the nature of their work (Cacciari et al., 2016). Female healthcare workers were also seen to have higher stress with respect to their situation and work (Schmitt Jr. et al., 2021). However, other studies show otherwise as they see men and women janitorial workers in a hospital setting holding a significant share of low-level stress (Kemp & Jenkins, 2020). Gender is also seen to not play a role in exposure to stress but males are more at risk of having higher levels of stress (Giurgiu et al., 2016). These imply that sex has an effect on the level of stress among maintenance workers.

For religion, the current study also found that this has a significant difference to the stress level of maintenance

workers. The effects of stressful experiences they might encounter in their workplaces are negated by their religion (Muathen, 2022). Majority of the maintenance workers that took part in the study are Christians. Results showed that their faith helped them in decreasing the level of their stress.

The study revealed a significant difference in stress level of maintenance workers when grouped according to employment profile. Particularly, it was shown that employment status and years in service have a significant difference in their stress level. Through a post-hoc test analysis, it was found that maintenance workers who are employed as casual or through job order have a lesser stress level compared to contractual employees. This result has been also found by another study which indicates that low levels of job control increase employees' mental stress (Hsieh et al., 2016). In addition, unemployment of healthcare workers was seen to have higher stress with respect to their situation and work (Schmitt Jr. et al., 2021). Meanwhile, full-time employees in hospitals are observed to have lesser strain of stress as the nature of their employment is secured (Giurgiu et al., 2016). This means that the temporary employment of contractual maintenance workers adds to their level of stress. In contrast, this is a result from a previous study which found that employment status does not affect the stress levels of all hospital staff (Acar, 2018).

On the other hand, the number of years in service has also a significance on the stress levels of maintenance workers. The current study portrayed that the stress levels are affected by the number of years that maintenance workers are in service. Workers past one year have shown to have a different stress level than those who worked beyond (Tangchareonsamut et al., 2021). Janitors were identified to have associations between high and low stress after one year of service (Mahfoudh et al., 2021). Mental workload and stress were also collected from janitors for a one-year period of service (Schwartz et al., 2020). However, there were also studies that disagree with this as they found no significant difference on the stress levels when grouped according to the number of years in service. Length of service in the hospital is not factored (Ream et al., 2016). Another study suggests that a significant difference is seen for those who rendered at least five years of work experience (Zadeh & Hashemi, 2017). These results imply that the number of years in service help in either decreasing or increasing the level of stress of maintenance workers.

Lastly, the research portrayed significant association between the level of stress and coping mechanisms of maintenance workers. It was found that a relationship exists between the stress levels of maintenance workers to their coping mechanisms, particularly on problem focused coping mechanisms and avoidant coping mechanisms. Despite not being the majority choice in the results, it was revealed that these two types of coping strategies relate with the level of stress of maintenance workers. It signifies that as the stress levels increase, the need or use of coping mechanisms increases with it. A previous study's findings lend further evidence to the association of stress levels and avoidant coping strategies (Guan et al., 2020; Eitle et al., 2014). Moreover, there was also a positive association between avoidant and problem-focused coping strategies, and stress of individuals (Beier, 2022). The varying levels of stress or effectiveness of measures were

assessed to have an association with their coping mechanisms (Rose et al., 2021). However, this result is in contradiction with a study which found that emotion-focused coping was the strategy used to cope with stress (Hajisabbagh et al., 2019). Among other health care providers, it was found as well that problem-solving coping was not significantly related to well-being (Sistler, 2019). It challenges the value of social support and problem solving as effective strategies for reducing stress.

IV. CONCLUSION

The study concludes that maintenance workers are experiencing a certain level of stress that is dependent on the amount of COVID-19 workload they are dealing with. Since the decreasing number of positive cases, the level of stress has seen to have decreased as well. The age, sex, and religion of maintenance workers also affect the level of stress they have. Furthermore, it has been found that their employment status and number of years in service have a significant difference in their stress levels. However, these levels of stress were addressed as coping mechanisms were found to be effective in lowering such. The decrease of stress level varies depending on the kind of coping strategy that maintenance workers use.

V. RECOMMENDATIONS

Overall, the study has shown that the maintenance workers are experiencing a moderate level of stress. Hence, it is recommended to administer appropriate interventions such as a stress management program that addresses the stress experienced by the maintenance workers. The University of Saint Louis Nursing Department may also conduct Service Learning Programs, particularly in stress management and effective coping strategies.

The researchers would like future researchers to continue to present some ideas toward more understanding of the changes in the stress level and coping mechanisms of maintenance workers. It is also recommended to have a larger population of target respondents than the current researchers and include workers from other areas of the hospital to better assess the stress levels and coping mechanisms of the maintenance workers.

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