The Impact of Graveyard Shift on Fatigue and Work Performance among Medical Technologists working in the National Capital Region

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Abstract: - The Impact of Graveyard Shift on Fatigue and Work Performance among Medical Technologists working in the National Capital Region aimed to determine whether the graveyard shift affects the fatigue of Medical Technologists in the National Capital Region, assess how the graveyard shift affects the work performance of Medical Technologists in the National Capital Region, identify which age group of Medical Technologists is mostly rotated during the graveyard shift and discover whether Medical Technologists in the National Capital Region prefer the graveyard shift. The study was assessed using a quantitative, descriptive correlational design, which was apt for determining the possible correlation between the variables above with existing factors and barriers causing fatigue and work performance of Medical Technologists in the National Capital Region. The objective of the study was achieved through the use of Google Forms, which was filled out by Medical Technologists who have experienced working during day shift and graveyard shift schedule. The researchers used this research method to collect the data needed to answer the research problems. Pilot testing was also performed to determine the reliability of the study. The questionnaire was able to collect 117 responses which were subsequently processed and analyzed using Microsoft Excel and RStudio. Results showed that work performance was greatly affected by graveyard shift although the results obtained from the fatigue subscales did not have significantly higher scores for two of the fatigue subscales, namely concentration and motivation. Fatigue subscales that were found significant were subjective feelings of fatigue and physical activity. As a result, the overall fatigue score is insignificant. The age group of Medical Technologists mostly rotated during the graveyard shift was 25-29 years old. Majority of the respondents do not prefer working under the graveyard shift.

Key Words: — ***Fatigue, Graveyard shift, Work performance, Work shift preference.***

I. INTRODUCTION

The demands for medical services have always been an essential part of society. The occurrence of diseases can happen at any time, and healthcare providers are responsible for attending to those affected. However, the demand for this has steadily increased over the years, and as a natural consequence, medical facilities had to adapt and compromise their work hours to cope with society's call (Hansen, 2017). Nowadays, several health workers have to work not only for the day but also at night to serve their patients. Among these are the medical technologists who work in clinical laboratories that are open 24/7. In some laboratories located in the heart of the city and are active throughout the day, such as the National Capital Region (NCR), medical technologists can be assigned nocturnal work shifts, which leaves them to work late at night instead of sleeping. One of the major work-related problems among medical personnel is fatigue. It is a common complaint encountered in the workplace (Jung-Chun Ho et al., 2013).

Nevertheless, it is essential to recognize that night shifts' unusual schedule also changes the medical technologists' sleep

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schedule, either by adjusting it to daytime or by reducing the amount of rest that they acquire. In the case of the latter, this can potentially affect their productivity. In addition, these workers are prone to sickness because of their constant lack of sleep and improper sleep-wake cycle (Fernandes-Junior et al., 2016).

A medical technologist's responsibilities include performing various laboratory tests that produce accurate and reliable results that will aid in the physician's clinical decisions. These kinds of services provided by medical technologists are required by the patient around the clock, which is why irregular work hours at night are present. This leads to physical health problems, particularly fatigue due to circadian disruptions and sleep deficits that can affect their work readiness (C. Potera, 2018). According to Narciso et al. (2016), the continuous sleep deprivation at night, combined with tedious and lengthy labor, negatively affects work that demands concentration and memory.

Moreover, a decline in cognitive function was also observed, which leads to poor decision making and ultimately resulting in the occurrence of errors in the workplace that could affect patient safety (M.Z. Ramadan & K.S. Al-Saleh, 2014). Graveyard shifts pose health and safety risks for medical technologists and a danger to their work performances. Learning about the dangers of shift work and seeking strategies to reduce these risks are advised. Employers should develop evidence-based programs, policies, and systems that support sleep health and safety. More continuing education courses are necessary for medical technologists that teach personal and occupational evidence-based practices to improve sleep and alertness. Possible changes and solutions for improving the graveyard shift will be addressed (C. Potera, 2018).

In a study by Alsharari (2019), night shift work has been recognized as an occupational hazard with short-term and long-term unfavorable effects. Short-term effects include burnout, eating, and sleeping disorders, and overall decreased quality of life. Additionally, long-term effects include the increased risk of obesity and other serious diseases such as breast cancer. During night shifts, the work performance and alertness of healthcare workers are most impaired due to inability to adapt to night work due to a lack of circadian rhythm (F. Ganesan et al., 2019). Night shift work causes sleep deprivation, which can negatively affect job performance and decreased alertness, leading to fatigue (P. Ferri et al., 2016). Fatigue resulting from disturbed sleep-wake cycle occurs frequently and can manifest shift work disorder (Adam et al., 2016).

According to a study by McClelland et al. (2017), a drop in cognitive and psychomotor skills is due to fatigue and sleep deprivation, which can affect a worker's attentiveness and capability to perform their job. Health worker trainees considered fatigue the cause of their substandard physical health, declining psychological well-being, and inability to perform well in training due to physical or mental unfitness. Some respondents also mentioned that their relationships have also been affected by work-related fatigue.

It has been revealed that the lack of rest breaks and few resting areas is a factor to be considered when discussing work-related fatigue. Some staff are unable to take their much-needed break due to the following reasons: the overwhelming number of patients that they need to attend to, lack of staff that can take over their role, or the absence of resting facilities. This study intends to know if the graveyard shift has an impact and its effect on the fatigue and work performance of medical technologists working in the National Capital Region for the year 2021.

II. METHODOLOGY

2.1 Research Design

The study utilized a quantitative, descriptive correlational design to assess the impact of graveyard shift on Medical Technologists' physical fatigue and work performance in the National Capital Region. Moreover, it helped determine the possible correlation between the variables mentioned above with existing factors and barriers affecting fatigue and work performance of Medical Technologists in the National Capital Region.

Quantitative research is a research approach used to assess objective theories by evaluating existing relationships between variables (Creswell and Creswell, 2018). For the analysis of the observations that will be obtained from the sample, the evaluated variables will be measured using statistical procedures, which will help avoid bias and manipulation in the analysis of results and provide for the generalizability and replicability of the findings. This will be represented in the study as quantitative data obtained from the respondents, which will then be analyzed to assess the variables' correlation.

The objective of the study was accomplished through the means of Google Forms, which was answered by Medical Technologists who have experienced working during day shift and graveyard shift schedule. The researchers utilized this research method in order to obtain the required data to answer the research 42 problems. Furthermore, pilot testing was conducted to establish the reliability of the study.

2.2 Subjects and Study Site

The survey was conducted through Google Forms that was sent via Facebook Messenger. The respondents in this research were Medical Technologists who were currently working at any laboratory or hospital in the National Capital Region under a graveyard shift. Non-probability sampling techniques were applied since not all of the Medical Technologists in the National Capital Region had the equal chance to participate in the survey. The researchers were tasked to gather 114 respondents in total based on the sample size calculation (57 participants from day shift and 57 participants from graveyard shift). After conducting the survey, the researchers were able to gather 117 respondents in total (59 participants from day shift and 58 participants from graveyard shift). 44 The day shift respondents served as the moderating variable. The day shift strengthens the impact of graveyard shift on fatigue and work performance.

In selecting the appropriate participants for the study, he/she met all of the following qualifications of the inclusion criteria: individuals who are 21 years old and above, a Registered Medical Technologists working under a graveyard shift in a hospital or laboratory in the National Capital Region, a Registered Medical Technologists working under a day shift (moderating variable) in a hospital or laboratory in the National Capital Region, and a Registered Medical Technologists who consented to participate in the study. On the other hand, the exclusion criteria for the respondents who will not be included in the study are: individuals who are younger than 21 years old, a Registered Medical Technologists who did not consent to participate in the study, a Registered Medical Technologists with no prior experience for both day shift and graveyard shift, and a Registered Medical Technologists who are working currently in both day shift and graveyard shift simultaneously. Moreover, the withdrawal criteria were included for respondents who choose to withdraw from the study: the participants may choose to withdraw from the study at any time for any reason, without penalty, and Medical Technologists who were terminated from employment during the duration of the study.

2.3 Data Measure/Instrumentation

The researchers asked the participants of the study to answer an adapted survey questionnaire based on the articles, “Fatigue among Working People: Validity of a Questionnaire Measure” by Beurskens et al. (2000) and “Experiencing Night Shift Nursing: A Daylight View" by Swartz (2006). It was a three-part questionnaire with 32 items. The first part (Part 1.1 and Part 1.2) focused on fatigue, the second part (Part 2) focused on work performance and the third part (Part 3) was work shift preference. The first part consisted of 20 questions. It was divided into two subparts, part 1.1 and 1.2. The first subpart included 11 questions. The second subpart consisted of 9 questions. The choices consisted of a seven point Likert scale. The first subpart had 1 as strongly disagree, 2 as disagree, 3 as somewhat disagree, 4 as neutral, 5 as somewhat agree, 6 as agree and 7 as strongly agree. The second subpart had a reversed scale with 1 as the strongly agree, 2 as agree, 3 as somewhat agree, 4 as neutral, 5 as somewhat disagree, 6 as disagree and 7 as strongly disagree.

There were four subscales for fatigue. It was calculated by summing the respective items. Subscale 1 was a subjective feeling of fatigue. It consisted of items 1, 4, 6, 9, 12, 14, 16, and 20. Subscale 2 was concentration, which included items 3, 8, 11, 13, and 19. Under subscale 3, motivation, were the items 2, 5, 15, and 18. Subscale 4 was a physical activity with items 7, 10, and 17. A high score means a high level of fatigue and a low score indicated a low level of fatigue. The second part of the survey which focused on work performance consisted of 11 items. The questions were a seven-point Likert scale. A high score means poor work performance and a low score indicated a good work performance. The survey was given via Google Forms. The third part of the survey consisted of 1 item. Its purpose was to know whether the participants prefer the graveyard shift.

2.4 Data Gathering Procedure

The study was conducted among Registered Medical Technologists who have experienced working on the graveyard shift and day shift. For the recruitment of respondents, the researchers posted on various social media platforms (i.e. Facebook, Instagram, and Twitter). The post consisted of the

Google form link and a Quick Response (QR) code which directed them to the Google form page that contained the survey. The first section of the Google form contained the purpose, 48 objectives, procedure, compensation, benefits and risks, voluntariness, confidentiality and the consent form. This stated that the answers they provided in the survey will remain confidential and their identities will remain anonymous. Before proceeding to the survey proper, the respondents were asked if they met the criteria set by the researchers. For the qualified individuals who consented to participate in the survey, they were redirected to the next section of the Google forms which contained the survey proper to be answered. The survey took 10-15 minutes of the respondent's time. The researchers gathered all the following data that was answered by the respondents.

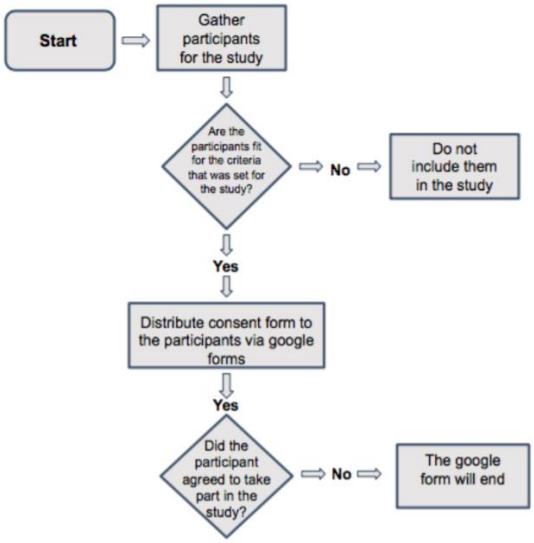

Fig.1. Flowchart of the Data Gathering Procedure

2.5 Ethical Considerations

Approval from the Ethics Review Committee was obtained before the survey was conducted. The purpose of the study was explained, and informed consent was obtained before the questionnaires were given to the respondents. The respondents must be aware of the research's purpose, how the findings were used, and who could see the findings. Participation was voluntary, and individuals may refuse to participate without the need to provide any reason for withdrawal. Individuals who agreed to participate in the study were assured data privacy.

The researchers sent a letter seeking permission to use the questionnaire of the survey questionnaire used by the study entitled "Fatigue among Working People: Validity of a Questionnaire Measure" and the study entitled "Experiencing Night Shift Nursing: A Daylight View". The researchers indicated that the survey was used solely for the research study and was not sold or used with any compensated activities and included the copyright statement on all copies of the survey instrument.

The researchers avoided any biases during the conduction of the study. Every respondent was subjected to fair treatment in this study. The presentation of the primary data findings did not exercise any biases. Any communication with regards to the research was done with transparency and honesty of information.

After completing the survey, a copy of their responses was sent to the participants via email. All data collected remained confidential and was only used for the sole purpose of the study. Anonymity and confidentiality of the respondents were maintained. Only the results of the study were used for the presentation of the final manuscript. If the participant wished to access the findings of the study, they may contact the researchers via email as provided in the beginning of the survey.

2.6 Data Analysis

The software that aided in the data processing and analysis were Microsoft Excel and R Studio. The demographic profile and work/shift-related information of the surveyed medical technologists were summarized using basic descriptive statistics such as frequencies and percentages. Additionally, the means, standard deviations, minimums, and maximums were generated for the work performance and fatigue subscale scores of the medical technologists. Lastly, a parametric statistical test, Independent Samples T-Test, was used to determine if graveyard shift affected the fatigue and work performance of medical technologists.

This was done by checking if the fatigue and work performance mean scores of the respondents working in graveyard shift were significantly higher compared to those working in day shift.

III. RESULTS

3.1 Results

A total of 117 valid survey respondents were gathered from the data collection. Among the respondents, 59 respondents answered for day shift while 58 respondents responded for graveyard shift.

Table.1. Frequency Distribution of Demographic Profiles

Characteristic	n (%)		Total
	Day Shift	***Graveyard Shift***	
Age			
20 – 24 years old	21 (17.9%)	15 (12.8%)	36 (30.8%)
25 – 29 years old	24 (20.5%)	27 (23.1%)	51 (43.6%)
30 – 34 years old	4 (3.4%)	5 (4.3%)	9 (7.7%)
35 – 39 years old	1 (0.9%)	6 (5.1%)	7 (6.0%)
40 years old and above	9 (7.7%)	5 (4.3%)	14 (12.0%)
Gender			
Female	43 (36.8%)	46 (39.3%)	89 (76.1%)
Male	16 (13.7%)	12 (10.3%)	28 (23.9%)
Type of Institution			
Private	36 (30.8%)	36 (30.8%)	72 (61.5%)
Public	23 (19.7%)	22 (18.8%)	45 (38.5%)
Duration of Shift			
Less than 8 hours	1 (0.9%)	4 (3.4%)	5 (4.3%)
8 hours and above	58 (49.6%)	54 (46.2%)	112 (95.7%)

Table.1. showed the demographic profile of the respondents using frequency and percentages. It can be seen that the highest count of respondents falls on the 25 to 29 years old age group with a total of 51 out of 117 (43.6%). In terms of gender, 89 out of 117 respondents were females while only 28 were males. Furthermore, the majority of the surveyed Medical Technologists in NCR were from private institutions. For the duration of shift, almost all answered that they work for at least 8 hours a day, only 5 answered less than 8 hours of work shift duration.

In general, Table 1 showed that the frequency distributions across shift by demographic profile are somewhat similar. To give further details on some demographic attributes, Table 2 is presented below.

Table.2. Descriptive Statistics on Demographic Profiles

Characteristic	Mean (SD)		Minimum		Maximum	
	Day Shift	***Graveyard Shift***	***Day Shift***	***Graveyard Shift***	***Day Shift***	***Graveyard Shift***

Age	29 (8.7)	29 (7.03)	21	21	55	61
Duration of Shift	9.4 (1.68)	9.1 (2.21)	6	6	14	14
No. of Days on the Current Shift	5.2 (0.72)	4.5 (1.14)	4	2	7	7

Table 2 showed that the average age across shifts were equal (*M=29*). Interestingly, the oldest respondent (61 years old) was working on a graveyard shift. For the shift duration, the minimums and maximums were the same for both day and graveyard shifts, with means relatively alike, too. However, the average number of days on their current shift was higher for day shift Medical Technologists.

Table.3. Correlation Between the Work Performance and Fatigue of Day Shift and Graveyard Shift Workers

Attribute	**Mean Score**			**P-value**
	Day Shift	**Graveyard Shift**	**Overall**	
Work Performance	35.3	40.3	37.8	0.0020*
Fatigue Subscales:	80.6	81.2	80.9	0.2474
Subjective Feeling	31.7	34.1	32.9	0.0002*
Concentration	20.4	19.6	20	0.9468
Motivation	18.3	16.1	17.2	0.9999
Physical Activity	10.2	11.5	10.8	0.0006*

**significant at 5% level of significance, [a] equal variances not assumed*

From Table 3, the average work performance score of Medical Technologists is 37.8. For the fatigue subscales, subjective feeling got a mean score of 32.9, a mean score of 20 for concentration, 17.2 for motivation, and 10.8 for physical activity. The overall mean for the fatigue score was 80.9.

To determine if graveyard shift Medical Technologists have significantly higher work performance and fatigue mean scores than those working in day shift, the results of the Independent Samples T-Tests were summarized.

The Independent Samples T-Tests on *work performance* (p = 0.0020), and two subscales of fatigue – *subjective feeling* (p = 0.0002), and *physical activity* (p = 0.0006) turned out significant at 5% level of significance. Thus, sufficient evidence against the hypothesis of no difference can be concluded for the said attributes. Specifically, on the average,

- Medical Technologists working on a graveyard shift had higher *work performance* scores (M = 40.3) which indicated poor work performance compared to those working on a day shift (M = 35.3);
- Medical Technologists working on a graveyard shift had higher *subjective feeling of fatigue* scores (M= 34.1) which indicated high level of fatigue compared to those working on a day shift (M = 31.7);
- Lastly, similar to 2), graveyard shift Medical Technologists had higher *physical activity fatigue* scores (M = 11.5) than day shift Medical Technologists (M = 10.2).

On the other hand, graveyard shift Medical Technologists did not have significantly higher scores for two of the fatigue subscales – *concentration* and *motivation.* Likewise, it can be noticed that the overall mean fatigue score was insignificant.

Table.4. Work Shift Preference of Medical Technologists in NCR

"I prefer working during the graveyard shift."		
Preference	**n (%)**	**Overall percentage**
Strongly Disagree	46 (39.3%)	59.9%
Disagree	12 (10.3%)	
Somewhat Disagree	12 (10.3%)	
Neutral	26(22.2%)	22.2%
Somewhat Agree	4 (3.4%)	17.9%
Agree	9 (7.7%)	
Strongly Agree	8 (6.8%)	

For the shift preference of the Medical Technologists working in NCR, it can be seen from Table 4 that overall 59.9% of the respondents did not prefer graveyard shift, about 22.2% were neutral, and the remaining 17.9% preferred working on a graveyard shift.

IV. DISCUSSION

This study aimed to explore the impacts of graveyard shift on fatigue and work performance among Medical Technologists in the National Capital Region. The researchers wanted to specifically assess whether graveyard shift affected the fatigue of Medical Technologists in the National Capital Region and determine how graveyard shift affected the work performance of Medical Technologists in the National Capital Region. The researchers also wanted to distinguish which age group of Medical Technologists was mostly rotated during graveyard shift and determine if the Medical Technologists in the National Capital Region preferred working during graveyard shift. The survey questionnaire used was adapted from articles, "Fatigue among Working People: Validity of a Questionnaire Measure" and "Experiencing Night Shift Nursing: A Daylight View". The questionnaire consisted of three parts with 32 items. The first part focused on fatigue, the second part focused on work performance and the third part was preference of graveyard shift. Although the results of the survey were gathered through Google Forms, the online questionnaire was designed to filter the respondents who were going to answer the questionnaire. Thus, some respondents who did not meet the criteria were not allowed to continue answering the survey.

Table.1. showed the Frequency Distribution of Demographic Profiles. The demographic profiles included in the questionnaire of the study were age, gender, type of institution and duration of shift. There were five age groups with the range of 25-29 years old as the majority age of the respondents followed by 20-24 years old, 40 years old and above, 30-34 years old and 35-39 years old as the age group with the least number of respondents for the day shift and total respondents. For the graveyard shift, 25-29 years old was also the majority age of the respondents followed by 20-24 years old and then 35-39 years old. The age group with the least number of respondents were 30-34 years old and 40 years old and above. From these, it can be said that most of the respondents were in their twenties and therefore, the sampled population was relatively young. Based on the third objective of the study, it was found out that 25-29 years old was the age group of Medical Technologists mostly rotated during the graveyard shift. As for the gender, there were more female respondents than males for both the day shift and graveyard shift. The study showed that most of the Registered Medical Technologists in the National Capital Region who answered the survey were working in a private institution rather than a public institution for both the day shift and graveyard shift. Most of the respondents were working for 8 hours or more in their duration of shift for both the day shift and graveyard shift.

According to Human Resources for Health Country: Philippines (World Health Organization, 2013) most of the Medical Technologists were less than 30 years old. This could explain why the majority of the respondents belong to the age groups 25-29 years old and 20-24 years old. For the gender distribution, 79% of the Medical Technologists were females while 21% of them were males. The study also had the same result with more females than males. 55% of the Medical Technologists worked in private institutions while 45% worked in public institutions. The gathered data from the study had also

the same finding with the majority of the respondents working in a private institution. The data were from the Department of Health in 2011.

The demographic profiles of the respondents were shown on Table 2. It consists of age, duration of shift, and number of days on the current shift, respectively. Based on the results gathered, the minimum age across shifts was 21 years old, whereas the oldest respondent on the day shift was 55 years old, and the oldest respondent on a graveyard shift was 61 years old. The findings suggest that graveyard shift work may contribute to an increased risk of chronic disease, with risk factors varying depending on the age at which night shift work was undertaken. (Wang, 2011). These statistics varied depending on the age at which the night shift was conducted, with an indication that graveyard shift work performed before the age of 25 was associated with fewer risk factors than night shift work performed at older ages (Ramin, 2015). Furthermore, age is a critical variable that must be controlled in such studies, as it is known that aging is linked to changes in shift work tolerance, increased frequency of rhythm disturbance, increased sleep problems, and cognitive decline (Blok, 2011). Moreover, insomnia becomes more common as people get older. Sleep difficulties a few times a week increased from 33% of women aged 18–24 to 48% of women aged 55–64, according to a National Sleep Foundation poll (Caruso, 2014). According to Blok (2011), in nine researches, shift and day workers were compared, and interactions with age were evaluated. Two studies found that older adults have more problems, whereas four studies found the opposite, and five studies found no significant age–shift work association. It was determined from the six research' across-shift comparisons that older workers have more sleep problems with night shifts than younger workers. Lastly, as shown in the Table 2 above, the minimums and maximums for shift duration were the same for both day and graveyard shift, with means that were similar as well. Medical Technologists who were under day shift, on the other hand, had a higher average number of days on their current shifts.

On Table 3, the work performance and fatigue scores based on the responses of the Medical Technologist were presented, with the fatigue score consisting of four subscales: subjective feeling, concentration, motivation, and physical activity. T-independent Sample T-tests were performed. Workplace fatigue is common every day. However, a person's performance may be affected in case of severe fatigue and severe long-term fatigue may lead to a work disability and sick leave. Due to sleep deprivation and circadian misalignment, shift work is linked to decreased alertness and performance (Ganesan et al. 2019). In a study conducted by Ganesan et al. (2019), when compared to day shifts, night shifts had the most impairment for alertness and performance, with the greatest impairment being seen towards the end of night shifts.

Work performance (p = 0.0020) and two fatigue subscales, namely subjective feeling of fatigue (p = 0.0002) and physical activity (p = 0.0006), were among the attributes that were significantly higher in medical technologists working on a graveyard shift compared to those working on a day shift. A high work performance score indicated poor work performance and high fatigue scores indicated high level of fatigue. A study by Neville et. al (2017) stated how a disrupted circadian rhythm may affect night shift workers. It is natural for the human body to experience sleepiness at night and be active during the day. With a disrupted circadian rhythm, an individual may struggle to fall asleep which leads to a reduced number of sleep hours, poorer sleep quality, and consequently, fatigue throughout the work shift. A medical technologist who is not well rested may pose a risk to themselves and the patients. Another study in which we can draw an analogy was about the failure rate of nurses working in a graveyard shift. The study showed that it is greater than the rate for nurses working on a day shift (Miller et al. 2010, Niu et al. 2012, Arimura et al. 2010, Tanaka et al. 2010, Arakawa et al. 2011). Fatigue and lack of sleep led to more errors during work (Johnson et al. 2014, Alemdar et al. 2013, Ramadan and Al-Saleh 2014, Arimura et al. 2010).

Furthermore, it was found that the other two fatigue subscales – concentration (p = 0.9468) and motivation (p = 0.9999), as well as the overall fatigue score (p = 0.2474) of those working on a graveyard shift were not significantly higher compared to the those working on a day shift. However, a difference does exist between the mean scores of the two groups. According to a study by Sanches et al. (2015), insufficient sleep due to night shift work in the medical field may contribute to a reduced attention, concentration, and lagged response to stimuli. Using the Toulouse-Piérson's tests, it was revealed that the subjects of the study who were sleep deprived had more omissions (p < 0.05) accompanied by a decrease in concentration (p < 0.05). Psychomotor tests were then used in the same group to analyze the response towards stimuli. It was found that the sleep deprived group has longer response latency (p < 0.05) and committed more mistakes (p < 0.05).

Additionally, based on the study conducted by Sarwar and Khalid (2015), a difference in work motivation among nurses exists between those who are working in day and night shifts. It was revealed that day shift nurses have more work motivation while night shift nurses have less work motivation. In relation to the study, it remains to be consistent with the findings of the survey wherein day shift workers (M = 18.3) are more motivated compared to graveyard shift workers (M = 16.1) as seen in Table 3, although it does not reach the level of significance (p = 0.9468). Sarwar and Khalid (2015) also noted that more night shift nurses complain about their work shift and only a few of them would choose to work on a night shift. They are unable to proceed with their responsibilities at home, to their family, and socialize with friends because of fatigue. With reduced support from family and friends, motivation to work is decreased as well.

The data gathered in Table 4 answered the fourth objective of study which aimed to discern whether medical technologists in the NCR preferred the graveyard shift. Majority of the respondents would rather not work under the graveyard shift (59.9%). Aside from an increased subjective feeling of fatigue and physical activity, graveyard shift workers endured insufficient sleep, family stress, and mood swings (Books et. al, 2020). In addition, other psychological effects they might have experienced were fatigue, decreased vigilance, and cognitive impairment (Karhula et al., 2013). Given the said effects of working under the graveyard shift, this compromised the quality of work that they provided. Hence, the reluctance of the majority of the respondents to work on a graveyard shift were influenced by these experiences.

V. CONCLUSION

The results of this study provided evidence that work performance among medical technologists working in the National Capital Region were greatly affected by graveyard shift. However, the results obtained from the fatigue subscales did not have significantly higher scores for two of the fatigue subscales, particularly concentration and motivation. Consequently, the overall fatigue score was insignificant. Medical Technologists working at a graveyard shift had higher work performance scores than those working on a normal day shift indicating poor work performance for workers under graveyard shift. Medical Technologists working on a graveyard shift had higher subjective feelings of fatigue scores and physical activity fatigue scores suggesting high levels of fatigue compared to those working on a day shift. The results of this study revealed that graveyard shift workers have higher scores for the fatigue subscales of the National Health and Safety Administration's Occupational Health Assessment. With 51 out of 117 respondents, the age group of 25 to 29 years old had the highest number of respondents. Accordingly, the majority of the respondents are in their twenties, indicating that the sampled population is relatively young. Based on the findings, about 60% of Medical Technologists working in the National Capital Region did not prefer graveyard shift, over 22% are neutral, and the remaining 18% favored working on a graveyard shift. Overall, Medical Technologists in the National Capital Region did not prefer the graveyard shift in terms of shift preference.

The present findings were in accordance with prior studies, with the consensus being that those who worked under graveyard shifts had a demanding and stressful profession that were frequently associated with psychological distress such as fatigue and poor work performance. According to the World Health Organization, shift work is a risk factor for many health disorders. In order to reduce the fatigue level and improve the quality of work performance, organizations should implement ergonomic criteria that minimize the adverse effects of shift work.

Recommendations:

The experiences gathered for the impact of graveyard shift on fatigue and work performance among medical technologists is limited to the participants of only one region, the National Capital Region. Future inquisitors are recommended to discover and analyze the impact of graveyard shift on fatigue and work performance among medical technologists from other regions and increase the number of respondents for the study to be more reliable and accurate.

The researchers recommended future groups to gather data from Medical Technologists working in other regions other than the National Capital Region for future studies regarding the impact of graveyard shift on fatigue and work performance. With this, researchers will be able to compare the similarities and differences of graveyard shift's impact among the Medical Technologists in laboratories and hospitals of different regions in the Philippines.

The researchers used questionnaires based on other journals. They combined questionnaires of two journals to form a new

one which answered all the objectives of the study. It is recommended to create a questionnaire based on the objectives and the review of related literature for it will determine the accuracy of the related literature to the own experiences of the respondents.

The researchers recommended using other means of gathering responses from their participants such as interviews in order to gain more insights about their personal experiences regarding graveyard shifts.

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