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THE IMPACT OF SHIFT WORK ON EMPLOYEE WELL-BEING AND PRODUCTIVITY IN TECHNICAL FIRMS IN MUSCAT, OMAN

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Abstract

This study investigates the impact of shift work consequences on mental health, stress, and well-being of employees in private sector technical organizations in Muscat, Oman. The major objective of the study is to investigate how working schedules, specifically night shifts, affect employees' health physically and mentally, their job satisfaction, and work-life balance. We used quantitative research design while employing a structured questionnaire where data was obtained focusing on employees of Crystal Flash Co. in the National Green Energy Trading SPC in Muscat, Oman. We found out the results of data analysis between day, and night-shift workers are related to stress and mental health issues. Additionally, the results indicated a strong positive correlation between years of shift work and stress levels. The study made recommendations based on its outcomes to improve workplace conditions, and psychological health support programs for workers. The findings offer valuable insights to the knowledge related to Omani organizations and employee issues to enhance employees' well-being and operational efficiency.

Keywords: Shift Work, Stress, Mental Health, Well-Being, Work-Life Balance

INTRODUCTION

Currently shift work has become common across almost in most of the manufacturing and technical industries. This is a compulsion of firms to maintain their operational efficiency. This contributes to the negative effect on mental health and employee's well-being (Brown et al., 2020). Shift work creates many disruptions resulting in circadian rhythms, chronic sleep loss, and social misalignments. Hence, there is an increased risk of depression, anxiety, and reduced cognitive performance **(**Kecklund & Axelsson, 2016). These disruptions reduce well-being of employees, reduce their productivity, satisfaction, and undermine their safety, affect overall quality of life (Brown et al., 2020). Contemporary studies emphasize that these disruptions become a mechanism to connect to psychological distress, health risks, and vulnerability of individuals due to non-standardized working schedules (Wong et al., 2019). Understanding these influences is important because these patterns create stress and affect mental health. Shift work schedules are common in industries that operate continuously. To meet market demands, such companies are dependent on workers who must work in rotating shifts. The usual patterns are day, night, and extended shifts. Shift work ensures operational efficiency, hence, job satisfaction, work-life balance, mental and physical health issues are affected (Costa, 2016). Research demonstrates that shift work disrupts employees and keeps them away from natural work rhythm, leading to sleep deprivation and stress (Kecklund and Axelsson, 2016). People working in manufacturing, installation, and technical support are more likely to experience these challenges. Studies also indicate that shift workers are exposed to a higher risk of fatigue-related accidents, persistent health problems, such as mental and physical health issues and cardiovascular diseases. However, despite all these issues. However, there is limited research on its effects on employees in Omani firms.

Shift work is inevitable in certain industries to maintain operations and efficiency, but it presents several challenges to employees. Workers experienced irregular schedules and extended working hours, which led to their dissatisfaction. In many aspects. Failure to address these challenges may lead to higher employee turnover, absenteeism, and reduced productivity levels in the organization. Most of the evidence in the literature presents studies investigating the impact and influence of shift work on employee well-being in Western industrial contexts (Costa, 2016; Kecklund & Axelsson, 2016). The literature lacks research on the impact of shift work on employees in Omani organizations. Unaddressed challenges related to employees' well-being at the workplace result in a higher employee turnover rate, absenteeism, and reduced productivity.

This study focuses on analyzing the well-being of shift-working employees in Omani organizations. This study provides insights into strategies for improving employees' working conditions for their well-being and better performance. Hence, this study assesses the impact of shift work on the well-being of shift workers in terms of physical and mental health and job satisfaction.

An extensive number of research has been conducted on shift-work in various industries; however, there has been a limited amount of focus on its effects on the lighting industry in Oman.

This study bridges the gap between existing research and impact of shift work issues on employees in Oman. The study provides knowledge insights and recommendations to enhance well-being of employees. Therefore, this study addresses the following research questions from sampled firms in Muscat, Oman.

- What is the impact of shift work on employees' physical and mental well-being?
- How does shift work affect employees' job satisfaction and productivity?
- What challenges do shift workers face? Workers. How do they balance their occupational and personal lives?

Furthermore, the findings of this study serve as a knowledge reference for future studies. The study provides recommendations to stakeholders highlighting the best practices for effective management of human resources. Particularly, for manufacturing and technical organizations, findings provide practical implications to maintain operational efficiency with suitable strategic interventions in working schedules of shift workers.

LITERATURE REVIEW

Shift work has become increasingly common in modern organizations, particularly in healthcare, manufacturing, hospitality, and transportation sectors where 24-hour operations are required. While such schedules enhance organizational productivity and service continuity, they are often associated with negative consequences for employees' mental health. Research indicates that irregular work hours disrupt circadian rhythms, increase psychological strain, and lead to long-term stress-related outcomes (Kecklund & Axelsson, 2016; Wagstaff & Sigstad Lie, 2019). Employees engaged in rotating and night shifts frequently report anxiety, sleep disturbances, depression, and burnout, which may reduce both well-being and job performance (Yuan et al., 2020; Booker et al., 2022). Understanding these effects is essential for developing organizational policies that safeguard employee health. This chapter reviews relevant empirical studies published from 2015 onward to examine the relationship between shift work, mental health, and stress.

Conceptualizing Shift Work

The definition of the International Labour Organization, shift work falls outside the standard working hours, including night shifts, rotating shifts, and split shifts (International Labour Organization, 2019). Industrial setups are increasingly relying on shift schedules to meet operational standards. However, scholarly examples from academic research note that this may create a misalignment between the biological sleep power cycle and the primary mechanism of human physiological needs with the work life (Barber et al., 2020). These misalignments create disruptions in hormonal regulation, sleep quality, patterns of recovery, and ultimately increase the vulnerability to physiological issues like stress, job satisfaction, and mental health issues.

Theoretical Foundations

According to the circadian rhythm theory (Ehlers, Frank & Kupfer, 1988), the human body has a natural rhythm of sleep and wakefulness, lasting for 24 hours throughout the day based on a 24-hour cycle of sleep and wakefulness. Working the night shift disrupts this rhythm, which in turn can lead to fatigue, a decrease in cognitive performance, and long-term health problems in the future (Keredt, 2003). Employees who work irregular hours tend to struggle to maintain stable sleep patterns and are more likely to develop sleep disorders as well as metabolic disorders at a much greater risk than those who work regular hours. With relevance to the Job Demand-Control model described by Karasek (1979), jobs that have high demands and offer a limited amount of control over their work schedules are more likely to cause stress, burnout, and job dissatisfaction than jobs with low demands and a greater amount of control. A shift-based work environment, especially those that are less flexible when it comes to scheduling, may lead to high levels of stress in workers as the inability to balance work and family responsibilities can result in high levels of stress in workers. The effort-recovery model (Meijman & Mulder, 1998) states that employees require sufficient recovery time to maintain physical and mental well-being. Usually, they do not get adequate rest time and are more likely to experience chronic fatigue and decreased job performance issues.

Many studies have investigated the impact of shift work on health and performance. Overall, this is a common finding that long-term shift work increases the risk of chronic diseases like fatigue, mental well-being issues, and even cardiovascular diseases. Generally irregular working patterns affect metabolism, leading to increased obesity and diabetes rates among shift workers (Kecklund & Axelsson, 2016; Costa, 2016; Harrington, 2001).

Shift Work and Employee Well-Being

Standard working hours have not expanded in the modern workplace. Therefore, organizations are seeking continuous coverage of operations. Especially in manufacturing, healthcare, and public service domains, shift work is a common strategy of organization to maintain their seamless operations with efficiency. No doubt these schedules enhance service reliability and operational efficiency of the organization. But researchers consistently report. Determinant consequences of worker psychological well-being related to shift work (Kecklund & Axelsson, 2016; Wagstaff & Sigstad Lie, 2019). Empirical studies have reported that irregular working hour disruption patterns and. Impair recovery processes. And are there reasons to alleviate stress levels, which ultimately diminish mental health and occupational functioning of workers? These effects become a reason to intensify the issue when schedules involve permanent night duty of people or there are rapid rotations between day and night shifts (Yuan et al., 2020; Booker et al., 2022).

Defining Shift Work and Underlying Mechanisms

Shift work is an occupational routine outside the conventional daytime hours that encompasses rotating schedules, permanent evening or night shifts, or sometimes split duty schedules. Similarly, extended working hours are also considered a problematic phenomenon for workers. Scholarly work disclosure reports physiological misalignment of work conditions to well-being of workers because it is different from natural biological rhythms and becomes a reason for health issues and stress among people who are exposed to this risk for a prolonged time. This kind of misalignment of working routines different from the natural dynamics of women's bodily requirements contributes to these regulations in hormones, sleep quality, and extended fatigue, which accumulates and informs a critical mechanism through which psychological outcomes emerge against the human requirements. According to this perspective shift, work is conceptualized not as a temporally allocated category, but rather as a systematic challenge that affects a person's cognitive, emotional, and physiological functioning in a systematic way.

Impact of Shift Work on Employee Well-Being

During night shifts as well as irregular working hours, this cycle is disrupted, resulting in insomnia and a lack of sleep. As a result of not getting enough sleep, many shift workers suffer from chronic fatigue and reduced cognitive function. Individuals suffering from excessive daytime sleepiness (EDS) are incapable of adapting to non-traditional sleep schedules, which may result in drowsiness throughout the day during work hours and an increased risk of errors

and accidents at work (Costa, 2016). This is evident that irregular sleep patterns and prolonged exposure to work environment creates stress, resulting certain metabolic disorders. Due to this reason shift workers are exposed to increased risk of mood issues and hypertension. Continuous disruptions to metabolic functioning is linked to higher rates of obesity, insulin resistance, and diabetes (Zhu & Mi, 2025).

Jobs demanding physical roles and technical responsibilities have association with risks when they work in shifts for a long time; this contributes to chronic stress issues and exhaustions, and mental health. Susceptibility to mood disorders such as depression and anxiety are common due to disruptions and reduces social engagement (Kecklund & & Axelsson, 2016).

Work-Life Balance Challenges

There is a correlation between employees' ability to balance work and personal responsibilities and the challenges they face during shift work that cannot be ignored (Bhat, Yousef & Saba, 2023). Many people struggle with limited availability during conventional social hours to maintain their social interactions with family and friends, but they find it difficult to maintain them. Sometimes they find it difficult to participate in family activities, which leads to mental stress and decreased personal involvement. These studies report that strong communication between management and employees is for addressing shift work challenges is essential to understand problems of workers. Therefore, regular team meetings and managerial support for employees facing work-life balance difficulties provide a better understanding of issues. (Ruksana Banu, 2013). Research indicates that employees suffering with fatigue exhibit lower concentration levels and have an increased likelihood of making errors while they are working on technical assignments (Kecklund & Axelsson, 2016). Harrington (2001) reports that there is a close link between work-life balance and working schedules and the overall well-being of employees. Usually there is often a conflict between family life and work life where workers feel a state of isolation. In the case of technical and manufacturing organizations, shift workers experience stress and anxiety, which leads to lowering their engagement and commitment. All these issues resulting from shift work consequences result in a decrease in employee productivity.

Coping Strategies and Best Practices

Research has revealed several strategies to mitigate the negative effects of shift work to enhance employees' well-being and organizational efficiency. These strategies focus on improving their time management, quality of sleep, fatigue, and mental health. Kecklund & Axelsson (2016) found that exposure to intense lighting with high brightness during the night

shifts causes the regulation of circadian rhythms and alertness maintenance. Where is natural daylight mimicking, which improves focus and productivity and reduces the risk of errors in technical tasks and precision-related works?

To improve mood and reduce symptoms of fatigue, scheduled rest breaks during the shifts enhance cognitive functions, resulting in a reduction in workplace accidents. Reduction in error rates, particularly in physically demanding and high-concentration work, has strategic importance in ensuring the efficiency of operations and productivity (Costa, 2016). Åkerstedt (2003) revealed that gradual shift transitions allow employees to adjust better to new work schedules, which helps the body to adopt different working hours and reduces circadian rhythm disruptions and long-term health risks of physiological diseases. The evidence from literature demonstrate that shift work has implications for employee's mental health and stress level. Contemplating the evidence from previous studies, we hypothesize the following.

H1: There is a significant difference between stress levels of day and night shift workers.

H2: There is a significant difference in the mental health issues between day and night shift workers.

H3: Stress and mental health issues of day and night shift workers are strongly correlated.

METHODOLOGY

The study is exploratory in nature. Quantitative research design was selected to assess the effects of shift work on the well-being of workers in technical firms in Muscat, Oman. The questionnaire was self-designed according to the data needed to infer results in the study. By collecting numerical data, statistical analysis can reveal patterns and relationships between shift work and employee well-being. Surveys allow structured responses from a large sample to be gathered efficiently, making the findings more reliable and generalizable. Research designs ensure that research problems are addressed systematically and effectively (Bloomfield & Fisher, 2019). Research designs that are well-structured ensure reliability, minimize bias, and allow replication (Arbale & Mutisya, 2024). We deployed primary data collection strategies in two companies (Crystal Flash Company and National Green Energy Trading SPC) randomly to get first-hand information that how shift work impacts physical, mental, and emotional well-being of participants. The questionnaire was developed based on insights from literature and validated through the opinion of teaching faculty. We distributed 60 survey forms with close-ended questions that were distributed physically in the workplace to ensure a high response rate. Out of the total 40 employees in both companies, they returned completed forms. Apart from demographic information, survey questions covered inquiries on work schedule, sleep patterns, stress levels, and overall job satisfaction measured on Likert-5 scale. Descriptive

analysis of data presented the patterns of behavior, t-test explained the difference of means between two groups, and correlation analysis revealed the relationship between shift work and employee well-being.

RESULTS

Descriptive statistics (mean, frequency, and standard deviation) in table 1 illustrates the data. T-tests were used to compare the well-being indicators between employees working night shifts and those working day shifts. Correlation analysis was conducted to determine the relationship between years of shift work and stress levels.

Table 1: Descriptive Statistics

Survey Question	Mean	Standard Deviation	Sample Size (N)
Exhaustion due to shift work	3.2	1.1	32
Health issues related to shift work	1.66	0.48	32
Impact on mental health	2.3	0.8	32
Feeling stressed or anxious	3.1	1.2	32
Productivity impact	2.0	0.7	32
Satisfaction with shift schedule	2.6	0.9	32
Engagement during shift	2.8	1.0	32
Flexibility vs. pressure	2.1	0.9	32
Work-life balance difficulty	3.1	1.1	32
Impact on family/social life	3.22	0.82	32
Missed family/social events	3.4	1.0	32

Descriptive Statistics

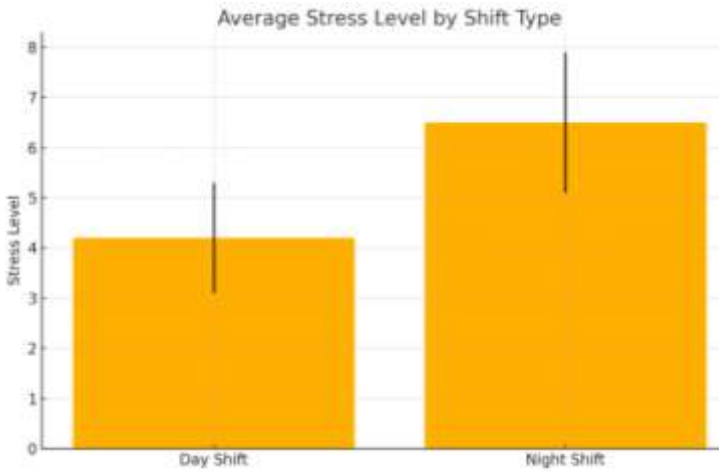

Figure 1: Stress level and shift work

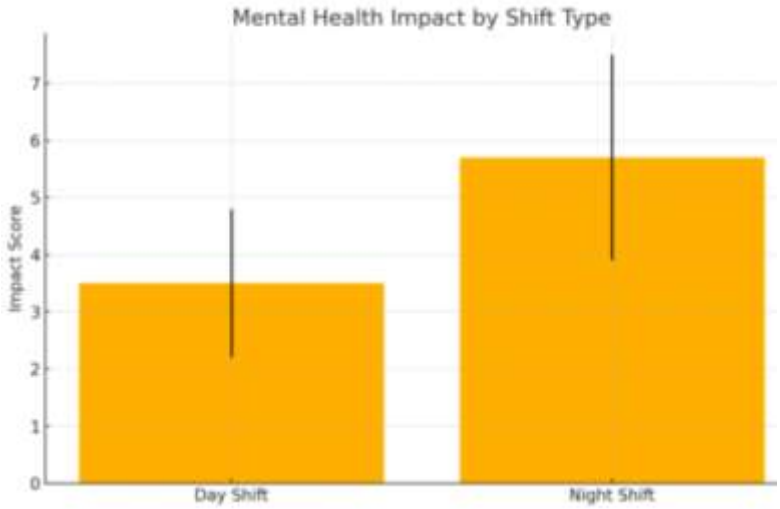

Figure 2: Shift work and Mental Health

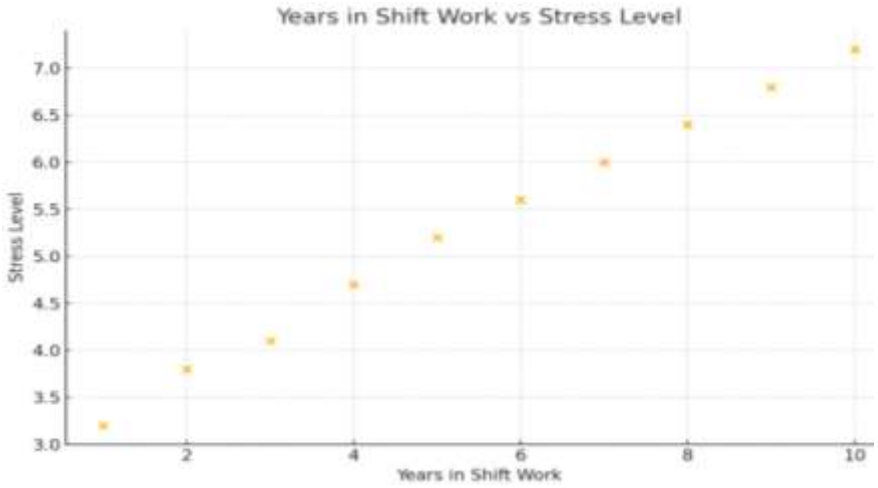

Figure 3: Years in Shift Work and Stress Level

Work-life balance

Table 2 shows work-life balance difficulty (M = 3.10), slightly above neutral, suggesting moderate difficulty managing work and life. The high SD (1.10) shows a widespread—some find it very difficult, others not much at all. Impact on family/social life (3.22), respondents are noticing a negative effect on their personal lives from work. Missed family/social events (M = 3.40) is the highest-rated issue, indicating it's the most experienced problem, though still not extreme. Productivity impact (M = 2.00): a low mean score suggests that employees generally do not feel their productivity is being positively affected; rather, it is likely to indicate a negative impact. Since the standard deviation is low (0.70), responses are consistent. Satisfaction with

the shift schedule (D = 2.60) is below the neutral midpoint (3.0), indicating low satisfaction with current shift arrangements.

Table 2: Work-life balance difficulties

Category	Mean	SD	N
Work-life balance difficulty	3.1	1.1	32
Impact on family/social life	3.22	0.82	32
Missed family/social events	3.4	1	32
Productivity impact	2	0.7	32
Satisfaction with shift schedule	2.6	0.9	32

Difference of Opinion between Groups

Table 3 shows a statistically significant difference found in stress levels (t = -6.16, p = 0.001). The t-statistic of -6.16 means the difference in stress levels between the two groups is more than 6 standard errors away from zero — a very strong deviation. The p-value of 0.0001 (less than 0.05) indicates that this result is highly statistically significant (Gravetter & Wallnau, 2020). Therefore, we reject the null hypothesis and accept (H_1): There is a difference in stress levels between the two groups.

Table 3: T-Test Results for Stress Level

Group	Mean Stress	Standard Deviation
Day / Night	4.2 / 6.5	1.1 / 1.4

Group	Mean	Standard Deviation	Sample Size (N)
Day Shift	4.2	1.1	32
Night Shift	6.5	1.4	32
t-Statistic	-6.16	-	-
p-Value	0.001	-	-
Degrees of Freedom	98	-	-

Mental Health Impact (Day vs Night Shift)

According to Table 4, there is a significant difference between the two groups in terms of mental health impact (t = -4.92, p = 0.037). This indicates that the test result is statistically significant because the p-value is much smaller than the threshold value of 0.05. This suggests strong evidence against the null hypothesis, meaning that there is likely a meaningful effect or

difference. t = -4.92. The negative sign indicates unequal variances, not strength. Therefore, we reject the null hypothesis and accept (H2): There is a significant difference in the mean.

Table 4: Mental Health Impact (Day vs Night Shift)

Group	Mean	Standard Deviation	Sample Size (N)
Day Shift	3.5	1.3	32
Night Shift	5.7	1.8	32
t-Statistic	-4.92	-	-
p-Value	0.000037	-	-
Degrees of Freedom	98	-	-

Correlation: Shift Work vs. Stress Level

As shown in Table 5, there was a significant positive correlation between the variables (r = 0.88, p = 0.000000). Considering this, H3 has been approved. A correlation coefficient of 0.88 indicates that there is a very strong positive relationship between the two variables. The tendency is for one variable to increase as the other increases as well, as one variable increases. P = 0.000 (effectively < 0.001). According to Cohen (1988), this strongly correlated result is highly significant statistically, so there is virtually no chance that such a strong correlation would occur by chance (if there were no correlation to begin with). The null hypothesis is therefore rejected and the alternative hypothesis H3 is accepted: The probability of shift work increases with the level of stress.

Table 5: Shift Work vs. Stress Level

Variable Pair	Shift Work	Stress Level
Shift Work	1	
Stress Level	0.88**	1
** significant at p-Value=0.000, N=32		

Table 6: Summary of Findings

Analysis	Stat Value	P-Value	Findings	Remarks
T-test Stress Level (Day vs Night)	6.16	0.001	Significant difference	H1: Approved
T-test Mental Impact (Day vs Night)	4.92	0.037	Significant difference	H2: Approved
Correlation between shift work and stress	(r = 0.88, p = 0.000).		Strong positive correlation	H3: Approved

DISCUSSION

Shift work is a significant challenge for employee well-being, as has been noted in the findings of the study. According to the results of the study, work and work-life balance is a moderately challenging task (M=3.10) for participants. It is not a surprise that most of the employees find it very difficult to maintain a balance between their personal and professional lives, as they do more than others. According to the outcomes of the study, shift work has a detrimental effect on family life (M = 3.22), as well as the ability to balance their presence at social events (M = 3.40). It is clear from the results that employees in the sample organizations in Muscat suffer disruptions in their personal lives because of shift work schedules. As indicated by the productivity coefficient (M=2.00), shift work has a negative impact on productivity, with small variations showing that shift work does not improve productivity. The mean score (M=2.61) reflects general dissatisfaction, which can be attributed to fatigue, irregular schedules of duties, and other factors which contribute to general dissatisfaction. There was support for the descriptive trends in inferential statistics. According to the results of the study, there was a significant difference in stress levels between day and night shift workers ($t = -6.16$, $p = 0.001$), which agreed with hypothesis 1. Furthermore, the difference between groups in mental health issues ($t = -4.92$, $p = 0.037$) supported hypothesis 2. It indicates that shift work creates psychological strain and mental health issues. Also, the statistical indicators indicate a strong and positive correlation ($r = 0.88$, $p < 0.001$) between stress level and shift work support the hypothesis that there is a strong association between stress level and shift work.

The results of the study reveal that shift work, particularly night shifts, have a significant impact on employee health-related issues as well as well-being, as revealed by the findings of the study. The stress levels among night shift workers and the mental challenges they face daily are significantly higher than those of their day shift counterparts. Moreover, the number of years one has spent working a shift job shows an increased tendency in terms of the stress level patterns. Based on the findings of this study, it appears that shift work has a cumulative and adverse impact over a period on the physiological health of employees. Therefore, organizations need to consider developing support systems such as mental wellness programs or shift transitions after a considerable period, in order to ensure that staff are properly supported. A further benefit of addressing the concerns of shift workers by establishing open lines of communication is that it will clarify their issues and help devise workable strategies to reduce their stress level and improve their health, so that they can be more engaged and productive.

Addressing these issues will ensure improvement in job satisfaction, reduction in burnout, high commitment, and improved productivity of employees. The outcomes of the study provide useful insight into understanding a persistent issue of shift workers in the manufacturing industry in Oman. Organizations in similar industrial contexts can get an insight from these results to inform their human resource management strategies regarding occupational health, aiming at healthier and sustainable workforce maintenance.

Overall, shift work has a negative impact on work-life balance, productivity, mental health, well-being, and social engagement among employees. It is evident from the results of the study that shift work adversely affects employees' work-life balance, their social lives, their job satisfaction, and their productivity in terms of their work-life balance. In general, the findings point to the need to consider shift arrangements and implement many years of stress mitigation to enhance employee satisfaction and performance.

RECOMMENDATIONS

Work-life conflict for employees working in shifts and rotating schedules is a significant problem in the workplace and needs to be addressed by the organizations in order to improve employee well-being. It is important for farms to ensure that working hours can be adjusted to allow employees to better manage work and balance their life. There are several ways to improve their engagement and satisfaction, including family support programs, leave policies, and inclusive events. Also, regular monitoring of workload and stress through surveys will help to identify overburdened employees and how shift patterns impact their lives, thereby enabling them to better manage their workload and stress. An employee's dissatisfaction may be reduced if their shift patterns are clearly defined, extended duty schedules of shifts are limited, and employees are involved in the design of the roaster to reduce their workload. A smooth shift handover protocol and brakes can be used to reduce fatigue and ensure productivity as they transition from one shift to the next. There are some alternatives to traditional scheduling, such as compressed work hours or flexible hours that may contribute to both employee satisfaction and performance, especially if they are piloted. Besides a continuous feedback mechanism including monthly surveys and open channels of communication, organizations may be able to adopt practices based on the experiences of their employees, leading to far better management of time by employees and the operations of their organizations. Both employees and firms can benefit from implementing these measures to promote a supportive work environment to minimize the adverse effects of shift work. Future research may extend sample size across diverse industries and consider intervening variables such as work environment and emotional support.

CONCLUSION

We have conducted this study to investigate what effect shift work has on the well-being of employees, productivity, and the balance between work and personal life within private technical companies in Oman. The study successfully drawn insights from experiences of the employees from Crystal Flash Company and National Green Energy Trading SPC who work in shifts. This study provides evidence that shift work significantly affects physical health, mental stability, and social relationship patterns of workers with the outer world. The study reports higher stress levels, sleep disruptions, and mental health challenges of night workers compared to day shift workers. There is evidence of a strong positive correlation between the years of work in shifts with increased stress levels and health issues. These negative effects are not short-lived but accumulate overtime, potentially leading to chronic health problems. A small number of participants noted some positive outcomes from working shifts, but these benefits were overshadowed by concerns about health risks, emotional exhaustion, and dissatisfaction by the majority. The study presents a picture that shift work is operationally essential in some situations but brings human costs. Overall, the findings of the study emphasize manufacturing and technical firms to reconsider their workforce management strategies. Proactive strategies and inclusion of employees in designing the roster of duties may support reducing the impacts of consequences of shift work. Since the research focuses only on one company, future research is necessary to effectively differentiate industry to industry differences on the impact of shift work on employees' well-being leading to productivity. This will enable wider implications for better understanding with regards to firms setting working conditions.

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