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Occupational Hazard of Night Shift on Medical and Dental Employee

Ibtisam Saad Muslih Alharbi[1], Albandari Bandar Abdulmohsen Alfarm[2], Abdullah Mushabbab Abdullah Alsirhani[3], Maha Mohammed Dh Alwagdany[4], Reem Omar K Alshaibani[5], Haya Abulaziz Abdullah Alzamil[6], Fawziah Mohammed Zaben Alotaibi[7], Adhwaa Muidh Sammar Almutairi[8]

[1]Consultant, Restorative Dentistry Prince Sultan Military Hospital, Riyadh, Saudi Arabia

[2]Consultant, Restorative Dentistry Prince Sultan Military Hospital, Riyadh, Saudi Arabia

[3]Consultant, Restorative Dentistry Prince Sultan Military Hospital, Riyadh, Saudi Arabia

[4]Consultant, Medical Medicine Prince Sultan Military Hospital, Riyadh, Saudi Arabia

[5]Registrar, Family Dentistry Dentistry and Related Specialties, Prince Sultan Military Hospital, Riyadh, Saudi Arabia

[6]Registrar, Advanced General Dentistry Prince Sultan Military Hospital, Riyadh, Saudi Arabia

[7]Technician, Dental Assistant Prince Sultan Military Hospital, Riyadh, Saudi Arabia

[8]Technician, Dental Assistant Prince Sultan Military Hospital, Riyadh, Saudi Arabia

[*]**Corresponding author:**
Ibtisam Saad Muslih Alharbi Consultant, Restorative Dentistry Prince Sultan Military Hospital
E-mail: e_alharbi@windowslive.co

Abstract

Night shift and rotating schedules are increasingly integral to 24-hour healthcare delivery, placing medical and dental employees at risk of circadian disruption and chronic sleep disturbance. Growing evidence links night work to adverse occupational health outcomes, including persistent fatigue, depression, and social disruption, alongside higher rates of cardiometabolic and gastrointestinal morbidity. Concerns have also intensified regarding cancer, particularly breast cancer, and shift work involving circadian disruption has been classified as probably carcinogenic by the International Agency for Research on Cancer (IARC) . This review synthesizes current epidemiological and mechanistic evidence on night shift work as an occupational hazard in medical and dental settings, incorporating key outcomes such as breast cancer risk, psychosocial wellbeing, and hearing-related occupational concerns relevant to dental practice, as well as downstream effects on body weight regulation. By integrating

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available findings, the review aims to inform preventive occupational health strategies and workplace policies that protect healthcare workers while sustaining essential 24-hour services

Keywords: Night shift work; Dental professionals; Dental healthcare workers; Occupational health; Breast cancer ; Cancer

Introduction

Healthcare systems worldwide have undergone substantial structural and organizational transformation over recent decades, driven by population growth, increasing longevity, the expanding burden of chronic disease, and heightened expectations for timely access to care. These pressures have accelerated the transition toward a continuous 24-hour model of service delivery in which night shifts, rotating schedules, extended duty hours, and irregular work patterns are no longer exceptional but integral to routine operations. Medical and dental employees represent a critical workforce within this model, frequently performing complex clinical tasks during night hours under conditions that may include reduced staffing, limited supervisory support, increased workload intensity, and restricted access to recovery opportunities. Although such schedules are essential for maintaining patient care continuity, they also create a distinct occupational environment that exposes workers to cumulative physiological, psychological, and social strain and has increasingly become a focus of occupational medicine and public health research [1–3].

Night shift work is defined by occupational activity occurring during biologically inappropriate hours, which disrupts circadian rhythm, the endogenous system regulating sleep–wake timing, neuroendocrine secretion, immune activity, metabolic processes, and psychological stability. Circadian misalignment is often accompanied by sleep restriction, fragmented sleep, and reduced sleep quality, leading to cumulative sleep debt and chronic fatigue. Importantly, these effects may persist even in individuals who report an apparently adequate number of total sleep hours, as sleep timing, continuity, and restorative quality may remain compromised. The consequences of chronic circadian disruption extend beyond transient tiredness; they may influence multiple organ systems and thereby increase vulnerability to a wide range of adverse health outcomes. In healthcare professions, where sustained vigilance, fine motor precision, rapid decision-making, and emotional regulation are central to safe practice, circadian disruption may also have indirect occupational implications through reduced cognitive performance, impaired attention, and increased risk of errors, making this exposure relevant to both worker wellbeing and patient safety [1–3].

Among the broad health effects associated with night work, psychological outcomes represent a major and clinically relevant concern. Evidence from occupational studies indicates higher rates of depression, anxiety symptoms, emotional exhaustion, and burnout among night shift workers compared with day workers. Several mechanisms may contribute, including persistent sleep disruption, reduced daylight exposure, impaired stress-response regulation, and chronic fatigue, which can affect mood stability and coping capacity. In parallel, social isolation frequently emerges as a structural consequence of night duty. Misalignment between work

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schedules and family or community routines may reduce social participation, weaken interpersonal relationships, and limit access to protective support networks. Over time, this social disruption may amplify psychological distress and reduce overall quality of life. These psychosocial dimensions are particularly relevant in medical and dental contexts because teamwork, communication, empathy, and emotional resilience are essential to clinical performance and professional sustainability [4–6].

Long-term disease risk has also become a central focus in shift work research, with cancer risk representing one of the most debated and extensively studied outcomes. Breast cancer, in particular, has received substantial attention because it is the most commonly diagnosed malignancy among women worldwide and remains a leading cause of cancer-related mortality. Despite improvements in screening and therapy, incidence continues to rise in many regions, including both industrialized and rapidly developing societies [7]. Although breast cancer etiology is multifactorial, occupational exposures have increasingly been explored as potential contributors, particularly in female-dominated healthcare professions where night duty is common. A key biological pathway proposed in the literature involves light exposure at night suppressing pineal melatonin secretion, thereby influencing hormonal regulation, increasing estrogen exposure, impairing DNA repair processes, and altering cell-cycle control. On this basis, shift work involving circadian disruption has been classified as probably carcinogenic by the International Agency for Research on Cancer (IARC), reinforcing the importance of occupational exposure characterization, duration assessment, and risk mitigation strategies for employees with prolonged night duty [8–12].

Beyond psychological and oncological outcomes, night work may intersect with additional workplace hazards that are particularly relevant in dental environments. Sensory strain, especially hearing-related occupational concerns, is an under-recognized but meaningful issue. Dental professionals are repeatedly exposed to high-frequency noise generated by handpieces, ultrasonic scalers, suction systems, and compressed-air equipment. Although many clinical settings do not resemble traditional industrial noise environments, cumulative exposure over years of practice may contribute to auditory fatigue and gradual threshold changes. When combined with sleep deprivation and reduced recovery time associated with night schedules, auditory strain may further compromise concentration, communication accuracy, and procedural performance, thereby increasing occupational burden and potentially affecting workplace safety and efficiency [13,14].

Metabolic health represents another important component of night shift–related occupational risk, particularly because circadian disruption influences endocrine function, appetite regulation, glucose metabolism, and energy expenditure. Irregular schedules may shift meal timing toward nighttime eating, increase reliance on convenient energy-dense foods during duty hours, reduce opportunities for planned physical activity, and impair restorative sleep that supports metabolic regulation. These behavioral and physiological disruptions can collectively influence body weight regulation over time. However, weight-related outcomes among night shift workers are heterogeneous and should be interpreted as part of a broader occupational exposure model. While many individuals experience gradual weight gain, others may report

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unintended weight loss due to appetite disturbance, gastrointestinal symptoms, or restricted access to regular meals during demanding shifts. Additionally, repeated attempts at intentional weight loss may be undermined by fatigue, circadian misalignment, and reduced recovery capacity, contributing to weight cycling and long-term metabolic instability [15–18]. Within this framework, overweight and obesity represent downstream outcomes that may emerge over prolonged exposure and may vary according to shift pattern, duration, recovery time, job demands, and individual vulnerability [15–18].

In summary, night shift work should be viewed as a multifaceted occupational hazard for medical and dental employees, with effects that extend across psychological wellbeing, social functioning, long-term disease risk, and workplace-specific exposures. Depression and social isolation, cancer risk with particular emphasis on breast cancer, sensory strain such as hearing-related concerns, and disturbances in body weight regulation collectively illustrate the breadth of consequences associated with circadian disruption in healthcare settings [1–18]. A comprehensive understanding of these interrelated outcomes is essential for informing occupational health policy, guiding preventive and scheduling strategies, and supporting a sustainable healthcare workforce while maintaining essential 24-hour clinical services.

Literature Review

Night shift and rotating schedules have become a structural requirement for hospitals and many clinical services, and the resulting exposure is increasingly framed as an occupational hazard rather than a simple "work timetable" variation [24,25]. In occupational health terms, shift work is not a single, uniform exposure; it varies substantially by pattern (fixed nights versus rotating shifts), intensity (number of consecutive nights), duration (years of exposure), rotation direction, recovery time, and weekly working hours, all of which can influence risk estimates and complicate comparisons between studies [27-32]. For this reason, literature examining shift work often spans multiple outcomes and adopts different methodological approaches to strengthen inference, including cross-sectional designs to detect associations and longitudinal designs to explore temporality and exposure–response relationships [27-32]. Within this review, the evidence is organized to (i) describe the broader health concerns that have positioned night work as a significant occupational exposure, (ii) summarize epidemiological findings across study designs, and (iii) critically discuss methodological limitations and plausible pathways that may link shift schedules to adverse health changes over time [27-32].

A major reason shift work gained scientific and policy attention is the concern that circadian disruption may contribute to chronic disease, including cancer risk [12-23]. Breast cancer has been a focal point in this discussion because the hypothesis linking light exposure at night with melatonin suppression provides a biologically plausible pathway for hormonal dysregulation and carcinogenic processes [12-23]. Multiple epidemiological studies across designs have reported results pointing in a similar direction: that long-term exposure to night work, particularly rotating night schedules, may be associated with increased breast cancer risk, with signals of dose–response patterns observed in some analyses [12-23]. Case–control work has suggested increased risk among women with frequent nighttime wakefulness and among those

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with long histories of graveyard shift exposure, and cohort evidence among nurses has also indicated higher risk with extended years of rotating night duty [12-23]. Although these findings do not establish causality on their own, the consistency across different designs and the presence of biologically plausible mechanisms strengthened occupational health concern, contributing to the classification of shift work involving circadian disruption as probably carcinogenic by the International Agency for Research on Cancer (IARC) [12-23]. Importantly, this cancer-focused evidence shaped the broader understanding of shift work as a multisystem occupational exposure and encouraged investigators to examine additional outcomes that might share overlapping pathways such as sleep loss, endocrine disruption, and altered health behaviors [12-23].

Beyond cancer-related concerns, epidemiological research has repeatedly linked shift work to cardiometabolic and gastrointestinal outcomes, including cardiovascular disease risk profiles, coronary outcomes, metabolic disturbances, and diabetes-related risk [24,25]. These associations reinforced the view that shift work may exert long-term physiological effects that extend beyond short-term fatigue, thereby motivating researchers to explore intermediate markers and behavioral pathways, such as sleep patterns, dietary habits, and physical activity, that might mediate these health impacts [24,25]. In this context, body composition and anthropometric outcomes became a logical endpoint of interest, because they are influenced by metabolic regulation, sleep-related hormones, and lifestyle behaviors that can be altered by night schedules [27-32]. Accordingly, a substantial portion of the shift work literature has examined changes in body mass index (BMI), waist-based indices, and reported weight change among shift workers compared with day workers, using both cross-sectional and longitudinal designs [27-32].

Cross-sectional studies have frequently reported higher BMI or higher prevalence of metabolic risk clustering among shift workers, though effect sizes and consistency vary by setting, population, and exposure definition [23-27]. Geliebter et al. evaluated employees in a New York hospital setting and reported greater mean weight gain among late shift workers compared with day shift workers (approximately 4.3 kg versus 0.9 kg), after questionnaire-based assessment and adjustment for variables including age, years of shift work, and smoking status [33]. Notably, that analysis also examined sleep-related behavior since job initiation and reported more napping time among shift workers, even though current BMI did not differ significantly between groups at the time of measurement, which suggests that short-term weight change and cross-sectional BMI may not always align in the same direction or time window [33]. Parkes et al. conducted a large study in British male industrial workers, comparing day workers with day–night rotating workers, and reported a significant increase in BMI among shift workers, with the increase associated with both age and duration of exposure to shift work [34-37]. This exposure–duration signal is important because it implies a potential cumulative effect and indicates that simple day-versus-shift comparisons may underestimate risk if years of shift work are not measured or incorporated into analysis [34-37].

A study in Malaysia assessing sociodemographic and lifestyle factors in a large sample of female factory workers found that rotating shift work was significantly associated with being

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overweight, alongside other correlates such as inadequate exercise and education level, emphasizing that occupational schedules may interact with socioeconomic and behavioral determinants [23]. In Sweden, Karlsson et al. investigated shift work in relation to metabolic syndrome parameters in a very large cross-sectional survey and reported that night shift workers more commonly presented with multiple metabolic risk factors and exhibited higher obesity prevalence, with an apparent widening of risk differences with increasing age [24]. This finding aligns with the concept that age-related metabolic vulnerability may amplify the effects of circadian disruption and irregular schedules, producing more visible risk differentials in older strata [24]. In Italy, Di Lorenzo et al. examined male chemical industry workers and reported higher obesity prevalence in rotating shift workers compared with day workers (approximately 20% versus 9.7%), with shift work significantly associated with higher BMI, although waist-to-hip ratio differences were not detected in that sample [25]. In contrast, Nakamura et al. reported that two- and three-shift workers had higher abdominal-to-hip girth ratio than day workers without differences in BMI after adjustment for age and several behavioral variables, suggesting that central adiposity and BMI may respond differently to shift work exposure or may be differentially captured depending on measurement and population characteristics [26]. A further study in a large metal factory sample suggested that both BMI and waist–hip ratio were associated with work characteristics, reinforcing the value of using more than one anthropometric measure when assessing risk patterns among shift workers [27].

Longitudinal evidence provides stronger support for temporality because it tracks change over time and can examine whether body weight indices increase after exposure to shift work begins or intensifies [28,33-37]. In Milan, a retrospective longitudinal analysis comparing permanent night workers, day workers, and workers transitioning from day to night schedules found that night work was associated with increased BMI and a higher prevalence of obesity, and that workers transferring to night shifts experienced BMI increases aligned with the period of night shift exposure [28]. These results are especially informative because they attempt to control for socioeconomic and educational similarity by comparing workers within the same occupational categories, thereby reducing confounding by occupational class, even though residual confounding remains possible [28]. Kivimäki et al. studied Finnish hospital nurses and reported that shift workers had higher odds of being overweight compared with day workers and that differences increased with age; however, sedentary lifestyle differences were not significant across groups, highlighting again that measured physical inactivity does not always track with BMI differences in cross-sectional comparisons [29]. Lee et al. examined working hours and sleep duration and reported higher BMI in shift workers, with BMI associated with longer working hours and shorter sleep duration, strengthening the argument that the schedule-related burden is not only “night work” but also the combined exposure of extended hours and reduced recovery [30,31].

More recent cross-sectional analyses in cohorts of nurses and midwives have similarly suggested higher prevalence of unhealthy weight among shift workers and reported lower physical activity levels, although the magnitude of association is generally modest and may be influenced by lifestyle clustering and selection effects within healthcare professions [32]. Studies focusing on nurses have also described self-reported weight gain in a substantial

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proportion of night shift workers, with weight gain associated with age and years of work, even when current BMI did not differ significantly between groups, echoing the pattern observed by Geliebter et al. that weight change metrics and cross-sectional BMI may yield different signals depending on timing and baseline differences [32,33]. Importantly, some nurse-based studies have reported longer sleep duration among night workers compared with day workers, suggesting that adaptation strategies (such as sleeping longer during off days) can modify the relationship between night duty and total sleep time, even if sleep timing and quality remain disturbed [32]. Other nursing studies have reported shorter sleep duration and poorer sleep quality with more frequent napping among shift workers, yet did not always observe larger weight change in night workers, illustrating that sleep metrics, body weight, and time horizon do not always align neatly across studies [32].

Prospective cohort studies offer an opportunity to examine exposure–response relationships with greater clarity. Niedhammer et al. followed French nurses over ten years and reported evidence supporting an association between night work and clinically meaningful weight gain, particularly in the second half of the observation period, with higher odds of gaining more than 5 kg or more than 7 kg among night shift nurses compared with day shift nurses after adjustment for confounders such as age, baseline BMI, smoking, births during follow-up, and sports activity [33]. The pattern of stronger effects emerging after longer exposure supports the idea that weight changes may accumulate gradually, and that short follow-up windows can miss meaningful risk [33]. Van Amelsvoort et al. also reported a positive relationship between shift work duration and increases in waist–hip ratio and BMI over time, estimating a gradual annual BMI increase among shift workers after adjustment for variables including age, smoking, education, and physical activity [33,34]. Evidence from Japan has further suggested that obesity risk may become more apparent after prolonged exposure, with one cohort reporting elevated risk ratios after approximately a decade of shift work, indicating that long latency and cumulative exposure may be particularly important in weight-related outcomes [35]. Suwazono et al. conducted a long-term prospective study over 14 years among Japanese male workers and reported higher BMI and weight change in rotating shift workers compared with day workers, with differences emerging early and persisting, while also noting that shift workers were more likely to lack habitual exercise and that dietary intake changes were observed later in follow-up, highlighting the challenge of capturing behavioral mediators consistently across time [36]. Another Japanese cohort study over ten years compared workers who remained on day schedules, switched between day and shift schedules, and remained on shift schedules, reporting that BMI increases were larger among those moving into shift work and among those remaining on shift work, with differences in caloric intake observed at endpoint, although physical activity was relatively underestimated, again illustrating how mediator measurement can affect interpretation of causality [37].

Despite the overall pattern suggesting an association between shift work and higher BMI or greater weight gain across many settings, the literature remains marked by methodological variability and several recurring limitations that restrict causal interpretation [27-37]. A first major limitation concerns exposure definition. Studies vary in whether they include permanent night workers, rotating shifts, irregular schedules, and the number of night duties per month,

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and some studies explicitly exclude permanent night work or irregular shifts, potentially biasing results if these patterns carry different risk levels [28,35,36]. In addition, many reports provide limited detail on rotation direction, number of consecutive nights, recovery days, weekend work, and overtime, all of which can influence sleep debt and behavioral patterns and may therefore modify risk [30-32]. Without standardized exposure characterization, comparisons across studies may yield apparent inconsistencies that are due more to exposure heterogeneity than to true differences in biological effect [27-32].

Selection bias is another persistent concern. Some occupational cohorts, such as industrial workers with specific fitness requirements, may be healthier than the general population at baseline, which can underestimate risk (healthy worker effect), while volunteer-based recruitment may over-represent individuals experiencing symptoms who are motivated to participate, potentially overestimating associations [34-37]. In several healthcare worker studies, educational level and health awareness may differ systematically between nurses, midwives, and other occupational groups, and work roles may not be equivalent between day and night staff, which can confound associations if job strain, workload, or task type differs by shift assignment [29,32]. In Di Lorenzo's study, the restriction to male blue-collar chemical industry workers limits generalizability and may confound results through occupational strain patterns and socioeconomic gradients, even though such cohorts provide valuable controlled workplace settings [25]. Attrition in longitudinal studies also introduces bias, particularly if individuals leave shift work due to health issues, which would remove those at highest risk from follow-up analyses and potentially underestimate associations [33,34]. Several cohorts reported non-trivial loss to follow-up, and in some studies there was limited documentation of shift schedule changes during the observation period, making it difficult to separate the effect of shift work from the effect of transitioning out of shift work due to health or lifestyle changes [33,37].

The handling of confounding and mediation is a third major limitation and arguably the most important for interpreting mechanisms [27-37]. Many studies adjusted for age, smoking, education, and alcohol intake, but fewer studies measured and adjusted for dietary intake, sleep quality, sleep timing, or changes in physical activity across follow-up, even though these are plausibly influenced by shift work and are strong determinants of weight-related outcomes [30-37]. In some studies, physical activity was measured at endpoint only, which cannot capture whether activity decreased after shift work exposure, and in other studies dietary intake was assessed late or not incorporated into statistical models despite evidence of differences in meal patterns or calorie intake among shift workers [36,37]. Furthermore, several studies relied on self-reported weight or weight change, which can introduce measurement error, while other studies used professionally measured anthropometrics, producing more reliable estimates but sometimes with fewer repeated measures [33-37]. This variation in measurement quality can create heterogeneous results, particularly when effect sizes are modest and confounding is substantial [27-32].

From a mechanistic perspective, the complexity of causal inference in this literature reflects two interacting realities: shift work exposure is multidimensional, and body weight outcomes are determined by multiple overlapping pathways [27-37]. Conceptually, the core question is

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not simply whether shift work "causes" weight gain, but which components of shift schedules disrupt energy balance and metabolic regulation, and under what conditions risk accumulates [30-37]. Several plausible mediators recur across studies even when they are not consistently measured. Sleep disturbance and circadian misalignment are repeatedly identified as key pathways because they can influence endocrine regulation and metabolism, which in turn can alter appetite, satiety, and energy expenditure [30-32]. However, the empirical evidence on sleep duration is inconsistent: some studies report shorter sleep duration and poorer sleep quality among shift workers, others find no difference, and some report longer total sleep time among night workers, likely reflecting differences in adaptation strategies, rotation patterns, and measurement methods [32,33]. These inconsistencies do not negate the potential role of sleep; rather, they suggest that sleep timing, fragmentation, and circadian alignment may be more important than total hours alone, and that studies relying on single questions about "hours slept" may miss clinically relevant sleep disruption [30-33].

Dietary intake and eating patterns offer another plausible pathway. Several studies indirectly or directly observed changes in eating habits among shift workers, including increased meal frequency or altered timing, which may contribute to changes in energy intake and metabolic regulation, particularly when eating occurs at night during circadian low points [33,36,37]. Yet dietary variables were often not included as confounders or mediators in analytic models, limiting the ability to distinguish whether shift work has an independent effect or whether it operates primarily through dietary disruption [36,37]. Similarly, physical activity patterns may change under shift schedules due to limited time, fatigue, and reduced access to structured exercise opportunities, but activity was often underestimated or measured only crudely, creating uncertainty about its contribution to observed BMI differences [23,29,36]. Importantly, some studies reported no differences in sedentary lifestyle measures despite BMI differences, which may reflect limitations of self-reported leisure-time activity instruments that do not capture occupational activity, commuting patterns, or fatigue-related reductions in non-exercise activity thermogenesis [29]. In addition, the impact of duration of shift work exposure appears repeatedly in cohort results, suggesting that cumulative lifestyle disruption and gradual metabolic changes may be central to observed effects, which is consistent with findings that risk becomes more apparent after five to ten years in some cohorts [33,35,37].

Taken together, the literature indicates that shift work is associated with adverse changes in anthropometric and metabolic indicators in many, though not all, studies, and the strongest signals tend to emerge in cohorts that capture longer exposure durations and use repeated, objectively measured anthropometric outcomes [33-37]. At the same time, the evidence base remains limited by inconsistent exposure definitions, selection effects, attrition, and inadequate measurement of key mediators such as diet, sleep quality, and physical activity changes over time [27-37]. These limitations mean that while an association between shift work and increased BMI is supported across diverse settings, causality cannot be considered fully established, and the specific mechanisms remain incompletely defined [27-37]. Future studies should adopt standardized shift work exposure metrics that capture pattern, intensity, and duration; incorporate objective or repeated measures of sleep and activity; measure dietary timing and quality longitudinally; and apply analytical approaches that can separate confounding from

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mediation across time [33-37]. Such improvements are essential not only to strengthen causal inference but also to inform targeted occupational interventions that reduce health burden among medical and dental employees working night schedules [27-32].

Within this broader occupational health framework, weight-related outcomes should be interpreted as downstream manifestations of circadian disruption and behavioral constraints rather than as isolated endpoints. When shift schedules reduce recovery time and increase fatigue, opportunities for regular physical activity may decline, meal timing can shift toward nighttime eating, and sleep quality may deteriorate, creating conditions that can promote gradual increases in BMI in susceptible individuals [23,30-37]. Over time, repeated disruption may contribute to overweight and obesity, particularly among workers with prolonged exposure to rotating or permanent night schedules and among older workers who may have greater metabolic vulnerability [24,33-37]. Therefore, the association between shift work and overweight and obesity is best understood as part of a cumulative occupational exposure model, in which schedule characteristics interact with sleep, diet, and activity patterns across years of work, producing heterogeneous but clinically meaningful risk trajectories in medical and dental employees [27-37].

Discussion

The literature on shift work generally suggests that employees engaged in shift-based schedules may have limited time and fewer opportunities for regular physical activity, which can contribute to lower overall activity levels. In the relatively small number of studies that have evaluated physical activity as a potential confounder, findings have been inconsistent. Several reports suggest an inverse relationship between body mass index (BMI) and physical activity, indicating that higher BMI tends to be associated with lower activity levels. However, at least one study reported higher physical activity among shift workers compared with day workers, and another study similarly described a positive association between BMI and increased physical activity. These mixed findings may reflect differences in study design, measurement tools, job roles, and the intensity of occupational activity versus leisure-time activity, emphasizing the need for cautious interpretation.

Sleep duration is another key factor that may influence weight-related outcomes among shift workers. Multiple studies have reported a positive association between short sleep duration and increased risk of overweight and obesity. Shift work is widely reported to negatively affect sleep quality, sleep timing, and sleep continuity, often increasing difficulty in initiating sleep and promoting fragmented rest. Sleep restriction and circadian misalignment may contribute to metabolic and endocrine changes, including hormonal disturbances that affect appetite regulation, satiety signaling, and feeding control, thereby facilitating weight gain.

Despite the biological plausibility of sleep-related mechanisms, the role of sleep duration as a confounding or mediating factor has not been consistently addressed across studies reporting an association between shift work and increased BMI. Several investigations describe poorer sleep quality, greater difficulty falling asleep, increased daytime napping, and shorter sleep

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duration among shift workers compared with day workers. In contrast, some studies have reported no meaningful difference in sleep duration between shift and day workers, and two studies even suggested longer sleep duration among shift workers. This variability may be explained by differences in shift patterns (fixed nights versus rotating schedules), adaptation over time, individual chronotype, cultural or family factors, and the methods used to assess sleep (self-report versus objective measures).

Taken together, these conflicting findings make it difficult to confirm whether sleep duration alone is a causal factor for increased overweight among shift workers and highlight the need for well-designed longitudinal research that can better clarify directionality and mechanisms. Although there is considerable evidence suggesting that shift work is associated with higher risk of overweight and obesity, a definitive causal relationship remains uncertain due to limitations in longitudinal data, variability in sample populations, methodological heterogeneity, and inconsistent control for confounders. Importantly, key determinants of weight status such as physical activity, dietary intake, and sleep parameters, which are plausibly influenced by shift work, are frequently inadequately measured or insufficiently adjusted for in many studies. Future research should incorporate standardized assessments of these variables and apply robust analytical approaches to distinguish confounding from mediation and to better explain the mechanisms underlying the association between shift work and BMI.

Conclusion

Night shift and rotating schedules are essential to sustain 24-hour healthcare services, yet accumulating evidence indicates that shift work may function as an occupational risk factor with meaningful long-term health implications. Current epidemiological findings suggest associations with adverse cardiometabolic and gastrointestinal outcomes, sleep disturbance, and reduced psychological wellbeing; however, the evidence remains limited by methodological heterogeneity, inconsistent exposure definitions, and inadequate control for key confounders. Future research should prioritize robust longitudinal designs and, where feasible, intervention studies that better characterize shift patterns, duration of exposure, recovery time, and the role of mediating factors such as sleep quality, diet, and physical activity.

In Saudi Arabia, locally generated evidence is needed to clarify the impact of shift work among medical and dental employees and to guide context-specific occupational health policy. Alongside research, institutions should implement practical strategies that improve the work environment for shift workers, including structured fatigue management, sleep-supportive scheduling, access to healthier meals during night duty, opportunities for physical activity, and targeted awareness programs. Within this broader framework, weight-related outcomes, including overweight and obesity, should be addressed as downstream consequences of circadian disruption and behavior change rather than the primary focus.

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