A Qualitative Exploration of the Shift Work Experience

The Perceived Barriers and Facilitators to a Healthier Lifestyle and the Role of the Workplace Environment

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Objectives: The study aimed to understand lifestyle practices among shift workers, including an exploration of workers' perceptions of their workplace environment (WPE). **Methods:** Fifteen focus groups (FGs) were conducted by two researchers, with a total of 109 participants. A pilot FG was carried out with both researchers present, to ensure consistency in facilitation. To ensure quality control, both researchers analyzed all data collected. **Results:** Two overarching themes were observed: barriers to leading a healthier lifestyle, and facilitators to leading a healthier lifestyle. The influence of WPE was central to both themes. **Conclusion:** Investing in employee health is beneficial, particularly among shift workers, who are at an increased health risk. Adopting organizational policies and environmental changes as a core strategy for workplace health promotion may create an environment that makes healthier choices more accessible to all employees.

The prevalence of shift work has increased in recent times, with approximately 17% of the workforce in Europe engaged in this type of work pattern.[1] Definitions of shift work vary in the published scientific literature. In Europe, shift work is defined as "any method of organising work in shifts whereby workers succeed each other at the same work stations according to a certain pattern, including a rotating pattern, and which may be continuous or discontinuous, entailing the need for workers to work at different times over a given period of days or weeks."[2,3] This typically entails working hours outside of the standard working week, and may involve evening, weekend, and rotating shift patterns. Shift work is prevalent across a wide range of occupational sectors, and is necessary for 24-hour services such as emergency, security and utility services, production lines, leisure and entertainment industries, and sectors that require work across different time zones.[4]

Unfortunately, these atypical working hours often lead to disturbances in workers' daily routine, namely disruption to internal circadian rhythms. The circadian system regulates the timing of daily variations in numerous behavioral, endocrine, and neurophysiological processes over 24 hours,[5] for example, sleep-wake cycles, metabolism, blood pressure, and the release of hormones. This approximate 24-hour biological rhythm is generated by the suprachiasmatic nucleus, which is located in the anterior hypothalamus of the brain.[6] Almost all bodily functions, from those at cellular level to large physiological systems, are circadian rhythmic and disruption to these key rhythms may have negative implications for health. Shift workers, therefore, have been reported to be at a higher risk of cancers,[7-11] particularly breast and colorectal cancer, metabolic syndrome,[12-16] type 2 diabetes mellitus,[17,18] cardiovascular diseases,[19-21] and gastrointestinal disorders[22] than those working typical hours. Shift work has also been associated with a poorer quality of life and increased mental health issues, such as anxiety disorders and depressive symptoms.[23,24]

It has been postulated that such higher disease risk in shift workers may be contributed to by altered lifestyle behaviors, brought about by these atypical and erratic working patterns. Shift workers have been reported to have poorer quality diets[14,25-27] and irregular eating patterns[14,28-30] than day workers. Shift work has also been associated with increased alcohol consumption[31-33] and higher rates of smoking.[34-37] There have been mixed reports on the effect of shift work on physical activity, with both positive and negative effects being reported.[38] Barriers to a healthier lifestyle exist for all individuals, and for some, this can be heavily influenced by features of the modern obesogenic environment. The increased availability of energy-dense processed foods, excessive portion sizes, unhelpful media and advertising practices, and social norms and cues surrounding eating may create obstacles to eating more healthily. Moreover, our increasingly automated society promotes a sedentary lifestyle that can substantially decrease the opportunity for physical activity. It is likely, based on current evidence on lifestyle practices among this group,[38] that shift workers may face additional barriers to a healthier lifestyle.

It is not just the pattern of work that may influence the health of shift workers, but the workplace environment (WPE) itself may play a key role in facilitating or preventing better dietary and lifestyle choices. It has been estimated that most adults in employment spend approximately 60% of their waking hours at work.[39] Therefore, the WPE has the potential to have a strong influence on health, and employers thus have the opportunity to create a work culture that promotes health, and improves the well-being of their workforce. Workplace health initiatives (eg, physical activity groups, smoking cessation) and careful management of shift work routines and patterns by employers can help minimize the deleterious effects of shift work on the body and promote workers' health and wellbeing. Employers stand to gain from investing in the health of their employees, as costs are minimized by decreasing sickness and absence, staff turnover, and the numbers of errors and associated costs, as well as having a more productive workforce[4] and potentially increasing staff morale.

To date, little research has been published with regard to improving modifiable lifestyle risk factors in shift workers and this behavioral change could play an important part in addressing some of the health risks associated with shift work. A lack of data on the barriers and facilitators experienced by shift workers when trying to lead a healthier lifestyle is a large obstacle in helping improve the health behaviors of this group. A deeper exploration of such factors influencing shift workers' ability to lead a healthier lifestyle will provide data that could be beneficial for such endeavors.

AIM

This qualitative study aimed to identify and gain a meaningful understanding of the barriers and facilitators to healthy lifestyle

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practices experienced by shift workers on the island of Ireland, including an exploration of workers' opinions on their WPE.

METHODOLOGY

Study Design

A qualitative approach in the form of focus groups (FGs) was used to gain an understanding of the issues faced by shift workers in relation to their lifestyle practices. Semi-structured FGs were used to facilitate the identification of unforeseen or overlooked issues while allowing flexibility of discussion. Fifteen FGs were conducted across the island of Ireland, with a total of 109 participants. FGs ranged in size from 5 to 12 participants (mean of 7) per group. Nine FGs took place in the Republic of Ireland (ROI) and six in Northern Ireland (NI). FGs in ROI and NI were carried out by two separate researchers. A pilot FG was carried out with both researchers present in order to ensure consistency in FG facilitation. To ensure quality control, both researchers analyzed all data collected in each jurisdiction.

Ethical Considerations

Ethical approval for this research was received from the Ethics Committee at the Dublin Institute of Technology (DIT), Ireland; the application and approval from the DIT was reviewed and agreed to by the University of Ulster Research Ethics Committee. All participants were provided with a study information sheet before participating. A verbal explanation of the study was also given at the start of each FG, and participants had the opportunity the ask questions or to withdraw from the study. Before commencing each FG, written informed consent was given by each participant.

Recruitment of Participants

Participants were identified and recruited based on sector of employment and location. The three largest sectors employing shift workers on the island of Ireland were targeted: the accommodation and food services (AFS) sector ($n = 5$ FGs), the health and social care (HSC) sector ($n = 6$ FGs), and the manufacturing/industry (M/I) sector ($n = 4$ FGs). Efforts were made while recruiting to ensure that the overall sample was broadly representative of rural/urban locations, gender, age, and public/private sector employment. Each group was composed of employees (M/F; 18+ years old) from the same organization. Contact was made with a designated person of authority at each organization, who disseminated information on the study to employees. Participants were offered a gift voucher valued at £15/€20 as a discretionary honorarium for taking part.

Focus Group Discussion Guide

Discussion points for the FGs were developed on the basis of gaps in the published scientific literature identified during an extensive literature review.[38] The draft discussion guide was piloted among a group of HSC workers in ROI ($n = 6$). Minor adjustments, including refining and reordering of questions, were made to the discussion points and the data gathered for the pilot study were deemed to be of high enough quality to be included in analysis of the study findings. The finalized discussion guide allowed room for broader discussion of issues of particular importance to each group as they arose.

Data Collection and Analysis

FGs took place on site in the workplace in a quiet space (eg, a meeting room). FG discussions were recorded using a digital dictaphone, and each lasted between 40 and 70 minutes. Participants' demographic and household characteristics were obtained via a questionnaire before commencing the group discussion. FG recordings were professionally transcribed verbatim and individual/company names removed to protect anonymity. The transcripts were reviewed and compared with FG recordings to ensure accuracy and to encourage familiarity with the data. Transcripts were imported into, the qualitative data analysis software package, NVivo 10.[40] An inductive thematic analysis procedure, as outlined by Braun and Clarke,[41] was applied to the data in order to identify common themes. Initially, transcripts were read repeatedly in order to achieve data ''immersion'' and generate initial ideas about trends within the data. Two researchers independently and systematically coded the transcripts and discussed the codes to verify the validity and reliability of their application to the data. Overarching themes and subthemes were then identified. Both researchers reached a consensus on the assignment of all themes (inter-rater reliability was therefore equal to 1.00, as there was full agreement) and extracted quotations to illustrate typical views.

RESULTS

The demographic profile of the 109 participants is presented in Table 1. The sample population was composed of 65 males and 44 females, and fell within the 18 to 64 years age range. The majority (80%) of participants were from the island of Ireland. Almost half (48%) were categorized as overweight or obese (based on self-reported height and weight), while 30% were physically active just once a week or less. Two overarching themes were observed across the FG discussions: the barriers to leading a healthier lifestyle, and the facilitators to leading a healthier lifestyle. The influence of the WPE was central to both themes.

Theme 1—Barriers to Leading a Healthier Lifestyle

Discussions of the barriers to healthy living concentrated largely on disrupted routine, tiredness, time management, and issues within the WPE. Workers' lifestyle behaviors were affected both during working and outside of working hours, and it was evident that shift work had a wide ranging effect on workers' lives. Barriers specific to each of the work sectors included in the study were also noted. Foremost, a lack of a consistent routine and erratic work schedules were perceived as one of the most difficult aspects of shift work and appeared to have a negative effect on lifestyle behaviors.

''Your routine is completely gone and you're not on night duty for long enough to adjust in one way (. . .) so you tend to not eat very well. . .'' (HSC worker)

''. . .what helps to reinforce an exercise regime is if it's consistent and regular, but with shift work you don't really have... that opportunity because your shift pattern is changing, so therefore that exercise isn't regular.'' (AFS worker)

''. . .if you're on a 9 to 5 the whole time you know exactly what's set out week from week ahead of you, you can plan so far ahead. But then in this shift you could be, every week it's kind of different. . .you're less likely to plan further ahead and then that's why you say oh I couldn't be bothered'' (AFS worker)

''. . .most of us are not getting home when you should be getting home. So you can't even plan to say I'll do the shopping on the way home, the shops are closed by the time your, if you're not living in a major town.'' (HSC worker)

Across all groups, tiredness was quoted as a major barrier for workers to make healthier lifestyle choices, often leading to a lack of motivation or will power. This physical and mental tiredness, and the resulting lack of motivation were often related to the intensity of workload and the effect shift work has on sleep quality and quantity.

''. . .when I go home from shift work I'm too tired I wouldn't be bothered cooking. So I just go to the supermarket on the way home and get a roll or chicken wrap or something.'' (HSC worker)

TABLE 1. Demographic Characteristics of Focus Group Participants (*n* = 109)

Demographics	*n* = (%)
Gender	
Male	65 (59.6)
Female	44 (40.4)
Age range, years	
18–25	18 (16.5)
26–35	34 (31.2)
36–45	25 (22.9)
46–55	27 (24.8)
56–64	4 (3.7)
Unspecified	1 (0.9)
Nationality	
Irish/Northern Irish	88 (80.7)
Other	20 (18.3)
Unspecified	1 (0.9)
Marital status	
Single	40 (36.7)
Living with partner	13 (11.9)
Married/civil partnership	52 (47.7)
Divorced/separated	3 (2.8)
Widowed	1 (0.9)
Highest education level	
Secondary school to age 15/16	6 (5.5)
Secondary school to age 17/18	14 (12.8)
Additional training	35 (32.1)
Undergraduate university	35 (32.1)
Postgraduate university	19 (17.4)
% with experience of types of shift work	
Day shift	39 (48.1)*
Night shift	38 (47.5)*
Rotating shift	56 (69.1)*
Employed full time/part time	
Full time	94 (86.2)
Part time	11 (10.1)
Unspecified	4 (3.7)
BMI, kg/m²[†]	
<18.5	1 (0.9)
18.5–24.9	43 (39.4)
25.0–29.9	38 (34.9)
>30	14 (12.8)
Unspecified	13 (11.9)
Smoking status	
Current smoker	17 (15.6)
Ex-smoker	36 (33.0)
Never smoked	53 (48.6)
Unspecified	3 (2.8)
Frequency of physical activity	
<Once per week	23 (21.1)
Once per week	10 (9.2)
2–3 times per week	39 (35.8)
4–5 times per week	25 (22.9)
≥6 times per week	8 (7.3)
Unspecified	4 (3.7)
Those who have made an attempt in the last year to:	
Lose weight	51 (48.1)
Eat less fat	61 (57.5)
Eat more fruit and vegetables	70 (66.0)
Take more exercise	79 (74.5)

BMI, body mass index.

*A large proportion of participants did not answer this question (*n* = 28), so results are presented as valid percentages.

[†]BMI based on self-reported height and weight.

"You don't have the inclination either coming off a long shift, you really have to make the effort." (HSC worker)

Many also recalled difficulties with time management, with workers experiencing time pressures both within the workplace and at home.

"...you come in at twelve noon and you finish at eleven, and then you're lucky to get maybe half an hour, if you're lucky"; "You get a toilet break if you're lucky"; "If you're lucky, yeah. We have situations where you don't get time, you just don't, we're just flat out all day" (AFS workers)

"I think the day is just so long, when you're doing a long day shift, 12 hours, you have the bones of an hour to an hour and a half to travel in and out to work, meal plans will not exist" (HSC worker)

"So essentially, so we can't really do our administrative roles and you know duties that we have to do after work and housework and washing the clothes is left behind and things like that, so definitely it does, you know prioritise your sleep and just conserve energy" (HSC worker)

"...it's hard to have a social life never mind even thinking about cooking. When am I going to see my friends, when am I going to see my daughter..." (AFS worker)

When faced with a lack of time, workers more often than not turned to convenience foods, with unhealthy, processed food more likely to be consumed.

"...you're coming home late in the evening sometimes it's easier just to eat something that takes not very much time to cook, which is usually not very healthy" (HSC worker)

"During the week you're getting a take away or you're doing things that are easy and quick" (HSC worker)

During discussions, it became evident that features of the WPE itself created difficulty in leading a healthier lifestyle and in particular eating healthily. In some instances, simply the availability of unhealthy or processed foods and the lack of healthy choices were barriers to healthy eating. A lack of canteen facilities, particularly at nights and weekends, created an additional barrier to healthy eating, and in these circumstances, takeaway foods were often the only option. In addition, many expressed disappointment at inadequate facilities for storing or preparing food brought in from home.

"If you're on night duty we have no canteen, or no area where you can get hot food. If you're on weekends, again the canteen is closed." (HSC worker)

"The only thing that seems to be access at night is these bloody vending machines. There's not the sight of bit of an apple or an orange or anything like that." (HSC worker)

"...there's fridges there but we're not allowed put our food in there ... So there's not really facilities." (HSC worker)

A demanding environment with a lack of breaks and heavy workload was an issue raised by many workers, particularly those in the HSC and AFS sectors. Unfortunately for some, an organizational culture of "how things are done around here" existed, which left them feeling helpless and unable to advocate for improved working conditions.

"No one cares if you don't get a break or if you have to work" (HSC worker)

"...it's never going to change unless we say something, like literally it's like 'well I trained like that, why can't you survive with no break'" (HSC worker)

On the basis of comparisons between groups, it was evident that work sectors differed in terms of factors that may help or hinder employees in their efforts to lead a healthy lifestyle. It was observed that HSC workers appeared to have the poorest WPE, with high on the job demands and a stressful working environment. This WPE typically did not lend itself to healthy dietary choices, with a lack of facilities for purchasing, storing, or preparing food, and insufficient breaks due to a high workload and staff shortages. Keeping hydrated was also highlighted as an issue among this group, with some avoiding drinking fluid, as taking bathroom breaks was difficult. Many workers from this sector expressed frustration at the irony of working in a setting that promotes health, while being unable to tend to their own health needs in terms of their diet and lifestyle.

"I suppose as health professionals we're very much aware of the effects of bad eating. And we're advocating healthy eating for our own patients and to the extent that we're advocating protected meal times for our patients where they're not disturbed during meal time. And yet we as health professionals and workers never get a protected meal time and very rarely have time to sit properly as you normally would do" (HSC worker)

The effect of shift work on their health was a frequent concern among workers from this group. Similarly, the WPE has a strong influence on health behaviors for those in the AFS sector. The majority in this sector had their meals provided free of charge in the workplace, with varying degrees of quality. Despite this, many still opted for unhealthy processed foods or takeaways. Some within this sector also had free or discounted access to gym facilities on site, which many found useful when trying to make lifestyle improvements. The main occupational barrier to a healthier diet perceived by AFS workers was on the job "picking" at food throughout the day, with easy access to food at all times.

"You pick up lots of bad habits in hotels and in bars and restaurants...like I found that when I worked in food and beverage, like if there's something in front of you, like croissants or whatever, you do sort of like go oh my break is not for another hour, I'll have a coffee and a croissant." (AFS worker)

"You get quick chips or running through the kitchen, just take a chip on the way, you know 100 a day"; "So much pick, like you just walk past, you pick up like piece of bread or bread roll, really unhealthy, it's not a piece of fruit you pick up." (AFS workers)

Workers in this sector also recognized that a lack of canteen facilities at night time created difficulty when trying to eat healthily. Similar to those in the HSC sector, on the job demands and insufficient breaks were an issue. When the moderator enquired specifically about alcohol consumption, workers acknowledged that increased consumption of alcohol was common due to the nature of working in the services sector, and the ready availability of alcohol in the WPE.

"To be really honest, like hospitality is quite a sociable industry, you know, and we...because we were working in the bars, you know, we would do quite a lot of drinking" (AFS worker)

Groups from the MI sector appeared to have a somewhat healthier WPE, and for the most part reported having reliable break times and a WPE that was more conducive to a healthy lifestyle. Groups from this sector reported the positive sides of shift work more often than those from other sectors, and workplace-related factors were less often mentioned as barriers to leading a healthier lifestyle. Some groups described the availability of unhealthy foods within the WPE as a barrier, such as vending machines or fried foods in the canteen.

"Yeah, there's temptation around every corner, you know what I mean. The canteen we have is, it's really just a sweet shop up there" (MI worker)

As a result, many reported bringing their own food from home. Issues related to disrupted routine and tiredness because of the specific shift patterns appeared to be the main barriers among groups from this sector.

On the whole, those with a less healthful WPE often expressed feeling low levels of control over their lifestyle choices. They frequently cited external factors as having more control over their lifestyle and health than their own choices, often identifying shift work and the WPE as being a strong factor in their inability to improve their diet and lifestyle. Examples were provided where efforts were made to improve their diet or lifestyle only to have these efforts hampered by elements of the job or the WPE, leading to feelings of powerlessness.

[in reference to a disturbed meal break]
"and then what happens is that's when the bad food comes in then because the stuff you've brought in all nice is spoilt, so then it's like, sod this and then you're down to the chip shop (...) you find because you just know the way the day is going it's busy, you've just got your food spoilt and that's like, well that's it really isn't it, so any plans you had to try and keep healthy that day is out the window." (HSC worker)

Feeling undervalued by their employer, along with stress and a poor WPE meant that for many, morale was very low within the workplace, which in turn affects motivation levels both within and outside of work.

"fall off the seat if they came in with something, you know, an initiative to keep us right, I mean we just wouldn't believe it" (HSC worker)

"We don't get paid half enough for what we do"; "And I think stress now at work really is adding to, you know particularly when people are working a long day and some staff would work 2 long days and maybe even 3 long days together"; "That's hugely stressful if you're working and you're not eating properly and you're very tired" (HSC workers)

This stress and lack of morale often manifested as apathy toward making lifestyle improvements and a defeatist outlook with a "why bother" attitude.

Theme 2—Facilitators to Leading a Healthier Lifestyle

Discussions of barriers to healthier living typically lead to workers to express their opinions on factors that could facilitate healthier living; however, in some instances, prompting was required in order to move discussions toward more positive dialogue. Broadly speaking, the opportunities for facilitating a healthier lifestyle reported during the discussions were either 1) areas that the employer or workplace could improve on; or 2) solutions for individuals themselves.

Employer/Workplace

It was evident from discussions that the WPE can be a strong influence on lifestyle behaviors. Many of the aforementioned

barriers were mirrored in discussions of facilitators, with suggestions and ideas from workers as to how employers might improve factors and facilities within the workplace making it more conducive to a healthier lifestyle.

"I think as an employer to have people doing shift work through the night, they have to be obliged to provide food for people. Now I'm not saying pay for it but it has to be available" (HSC worker)

"They supply fridges too for keeping all your lunches chilled and stuff" (M/I worker)

"And it's all about the choice you have if you have stuff like that you go, 'Oh I wouldn't mind a bit of fruit today' or if it's just a fry you go, 'Well I'm going to have to'"; "Yes, better quality and more choice" (HSC workers)

"Just for argument sake, if there was a gym here within the plant we'll say, at night time you'd see a lot of fellas going to that rather than going to eat" (M/I worker)

The availability of food within the workplace including outside of regular daytime working hours was frequently highlighted across most groups as an important opportunity for improving dietary choices, on the condition that healthy dining and snack options were available.

"it's also availability really of healthy food because I can't go to the kitchen and go you know oh I want salad, this and that and no sauce and blah, blah, blah" (AFS worker)

"the vending machine upstairs, the Coke machine and there's a sweet machine. Like in a work place they shouldn't be there" (M/I worker)

In addition, many workers, particularly those in the HSC and AFS groups, highlighted the importance of "protected times to be able to eat" with adequate cover, in order to prevent being called back to work early thus allowing sufficient time to eat and to help improve overall meal patterns.

The topic of workplace health initiatives was raised by some groups, with some employers and larger organizations already being particularly proactive in this area, while others had experience of such initiatives in previous employment. It was evident that where workplace health initiatives were available, they were generally well received by workers. For those workers who had no direct experience of such initiatives, they were, on the whole, receptive to the idea.

"We actually had... do you know the TV programme, the Biggest Loser... we actually did that with the staff... and we actually got people on there with their weekly weigh ins and things like this, so yeah that was good fun actually." (AFS worker)

"as I got older, I started feeling a bit worse maybe and put on a bit of weight, and then it coincided with them here, the [workplace health initiative] and this and that. They were giving you more information about your diet and about exercise and then once I got kicked on that, I started feeling better, started managing better." (M/I worker)

It was apparent that when a WPE was supportive of a healthier lifestyle and promoted health more often, it was perceived by some that improvements in lifestyle behaviors were simply down to personal choice.

"It's up to everybody to control their own shift pattern themselves. You just can't blame the shift pattern. You're in control of it, you should look after yourself" (MI worker)

Those in a WPE that had a more positive culture and attitude toward health appeared more empowered in their lifestyle choices and less often cited shift work or issues within the WPE as barriers to a healthier lifestyle. The positive effect of investing in staff welfare was evident from some groups, and it was clear that feeling valued by their employer encouraged employees to value their own health too.

"I think the last three or four years they [the employer] really have upped their game regarding us. They realise that we're a resource and helping us how to feel better. I think that generally there's more education…, …so they're taking a proactive approach to it, and it's noticeable" (MI worker)

Individuals

Advice, specifically tailored for shift workers, was welcomed by the majority of workers, with the caveat that this was consistent, practical, and achievable—and invested in by the employer.

"it's alright getting the information but what you would have to do is get the company to buy into it because unless the company buys into it there's no point handing out leaflets, you know, they would have to be actioned rather than just having the theory" (AFS worker)

Particular areas of interest included education on time management, meal planning, optimizing sleep patterns, and information on the risks associated with shift work. Suggested media for communicating advice included a local intranet site, monthly newsletters or posters, and apps and/or social media that would allow workers access information at a time that is convenient to them. It was also noted that this might be particularly useful for younger people when just starting shift work, trying to adjust for the first time to disrupted lifestyle routines after many years of structured education, for example.

Other ideas volunteered included ways to increase organization and planning around grocery shopping, meal planning, and meal preparation in order to help facilitate a healthy diet, and it was suggested that this improved time management could help reduce stress and reliance on convenience foods.

"Cook once a week, normally is what I do is on a Monday, I cook and freeze for the week. So you have all your lunches for the week, just take out whatever you fancy out of the freezer like, you know, so you've some basic plan." (M/I worker)

"…if you're hungry at 2 o'clock and you didn't go to the trouble of getting your own lunch, you're going to go for something that's the wrong food." (M/I workers)

Others felt that bringing their own meals from home into work "because you know exactly what you're making," helped to ensure that they had more control over their dietary choices.

"Most people if they're eating better, eating well, bring their own. That's basically the bottom line, rather than relying on the canteen cooking something healthy, you bring your healthy stuff when you want to eat something more healthy" (M/I worker)

When prompted, workers also discussed the motivators for improving their diet and lifestyle. For some, intrinsic health concerns such as weight gain, body image, and "how you feel in yourself" motivated them to improve their lifestyle. The enjoyment of eating well and exercising motivated some people, along with the

effect of improving mood. Some concede that "it's very hard to do it by yourself" and so the actions of those around them appeared to have an effect, motivating them to improve their own lifestyle practices.

It was also noteworthy that individual differences in tolerance of shift work were apparent in the FGs, irrespective of the WPE. There was a general consensus among the groups that despite the barriers and facilitators stated by participants, it was easy to "blame shift work" for making poorer choices.

"sometimes say ah sure it's ok I'm on nights, I can have one, let myself go like" (MI worker)

"Even on the way home though like from the shift, like I pass the shop and I have to go in and get something for myself, because I feel sorry for myself, I deserve it" (HSC worker)

Justifying poor lifestyle choices due to shift work was mentioned by some. This highlighted the importance and role of individual intrinsic factors such as motivation to improve lifestyle. "I think you need to keep yourself motivated because...if that's gone, you know, then you can blame everything by work. You know, it sounds very bad that we all say, you know, "My shift, this, that, the other," but..."; "You have to motivate yourself" (AFS workers)

It was believed by many that it is possible to make time for a healthy diet and an active lifestyle through being organized, planning ahead, and managing time appropriately.

DISCUSSION

The present study provides a novel qualitative aspect to the investigation of lifestyle behaviors and workplace health across a range of shift workers, and identified the many barriers that can exist, which may prevent shift workers leading a healthier lifestyle. The rich qualitative data revealed that shift work impacts on most aspects of workers' lives and not solely on days when shift work is carried out. Discussion of these barriers also highlighted opportunities or facilitators to healthier living, such as actions that both the employer and individual employee may take. In addition, discussions revealed the influence which the WPE itself can have on workers' ability to lead a healthier lifestyle, with the culture within the workplace appearing to influence workers' perceptions of the control they have over their lifestyle choices. The present study also indicated that shift workers are receptive to the idea of workplace health promotion (WPHP), and this is a key avenue that should be explored by employers.

Feelings of disorientation and being "under pressure" were a strong undercurrent during discussions of barriers to a healthy lifestyle. A constantly changing routine, frequently altered shift schedules, and long shifts impeded workers from staying on top of their day-to-day activities and commitments. This manifested itself in difficulty planning and preparing meals, doing supermarket shopping during opening hours, or engaging in regular physical activity. It was evident that the difficulty balancing daily activities outside of working hours such as sleeping, eating, commuting, and exercising was a major frustration for many. This disrupted routine and intense time pressure also impacts on workers' abilities to maintain relationships with family and friends, as well as maintain a household. Healthy eating and physical activity, therefore, became lower priorities to essential tasks and commitments such as sleeping and family time. Such pressure was also experienced within the workplace with an intense workload, insufficient breaks, and high work-related stress, particularly among the HSC sector. The present study clearly reflects the extent to which the WPE may impact on workers' abilities to lead a healthy lifestyle, with differences observed between employment sectors. Observations surrounding negative workplace health culture and the subsequent effect of this on workers' locus of control over their own lifestyle and the value which they place on their health were also clearly apparent.

Many of the identified barriers in the present study concur with those reported in similar previous studies, with the most commonly cited perceived barriers relating to the WPE and related facilities, such as a lack of breaks, unfavorable shift patterns, poor food selection, canteen opening times, and work-related stress.[42–45] Issues highlighted in the present study that relate to shift work in general, such as tiredness, a lack of time or routine, and the subsequent effect of this on meal planning and use of convenience foods, echo those reported by Phiri et al[45] in their qualitative study of nurses. Intrinsic factors, such as a lack of motivation to lead a healthier lifestyle were identified in the present study, illustrating that some of the reported poorer lifestyle choices among shift workers may be independent of work pattern. Such factors have previously been described, specifically a lack of knowledge surrounding healthy eating.[42] Addressing such issues requires specialist competence in behavioral change in order to empower and provide shift workers with the skills to implement lifestyle change.

It was encouraging in the current study that workers appeared to be receptive to WPHP, as well as improved eating and exercise facilities as facilitators to help them make healthier choices within the workplace. Ideas for WPHP included information on diet and physical activity, regular health checks, subsidized canteens or exercise facilities, or organized group activities within the workplace. In particular, the use of mobile applications and social media was highlighted as a potential method for promoting health, particularly among younger workers. Those who had encountered WPHP were satisfied with their experience and it was clear that WPHP was successful in boosting morale among staff. On the contrary, in such discussions of WPHP, it became apparent that many from less positive WPEs felt undervalued by their employer. Without the employer fully engaging with the idea of investing in their staffs' health, workers found it difficult to prioritize their own health. This belief of a lack of support from the WPE perpetuated the lack of intrinsic motivation in such individuals, complicating the situation further. Many subsequently had become disengaged and disillusioned. In contrast, those who felt valued and invested in by their employer were observed to have greater job satisfaction, confidence, and sense of control over their lifestyle. This demonstrates the powerful effect of workplace culture on both physical and mental health.

The importance of WPHP has been acknowledged by the World Health Organization (WHO). The WHO defines health promotion as "the process of enabling people to increase control over, and to improve, their health,"[46] and the WHO Ottawa Charter for Health Promotion states "work and leisure should be a source of health for people. The way society organizes work should help create a healthy society."[47] WPHP initiatives specifically among shift workers have previously been explored; however, well-designed intervention studies are lacking, leading to lack of clarity on their effectiveness compared with day workers. Nonetheless, recent evidence suggests that when WPHP is available to them, shift workers do not differ significantly from day workers with regard to participation.[48] A critical review of health-related interventions among shift workers reported that while shift scheduling has in some cases been shown to improve lifestyle behaviors, this alone is not enough and interventions targeted specifically at improving lifestyle behaviors are necessary.[49] This highlights the importance and relevance of the present study in identifying how barriers to improved lifestyle behaviors may be addressed. The success of WPHP initiatives among shift workers indicates that targeted physical activity programs improve cardiorespiratory fitness and

strength[50,51] and that targeted workplace weight loss programs significantly improve anthropometrical measurements, blood pressure, and physical activity levels.[39,52] Taking its evaluation one step further, one workplace-based weight loss program also reported significant improvements on work-based outcomes, for example, having a positive effect on quality of life, productivity at work, and absenteeism.[52] These observations from previous studies and supported by the present study provide evidence in favor of WPHP, supporting the WHO's stance; it is in the employer's best interest to have a workforce that is happy and healthy.

Although much of the discussions in the current study focused on what the employer could do to better facilitate a healthy lifestyle, workers typically focused less on the responsibility of the individual in enabling healthy changes, such as improved time-management, organization, and planning. Differences were observed in individual intrinsic motivation to improve health and cope with the demands of shift work, which has been previously described as the individual tolerance to shift work,[53] including a tendency toward an internal locus of control. Locus of control has been explored specifically among shift workers.[53,54] Shift work related internality was associated in these studies with more positive outcomes in terms of sleep issues, disruption to social and family life, improved subjective mental and physical health, and greater job satisfaction. This implies that those who tend toward having an internal locus of control may cope better with the demands of shift work, which may account for some of the observed individual differences in intrinsic motivation to improve health.

CONCLUSION

Investing in employee health is beneficial to the employer, particularly among a group such as shift workers, who are at an increased health risk. Employers should adopt organizational policies and environmental changes as a core strategy for WPHP. Changes in practices and alterations in the WPE, for example, making healthier food choices available, providing facilities for storing and preparing food, making it easier for employees to engage in physical activity as part of their working day, ensuring sufficient breaks, and supporting those who wish to make healthier lifestyle choices, can influence and shape the workplace culture thus creating an environment that makes the healthier choice more accessible to all employees. In addition, improved shift scheduling would allow shift workers to plan and be more organized outside of work, which may encourage healthier dietary and lifestyle choices by enabling workers to better plan their meals and physical activity. In a cohort such as shift workers where poor lifestyle choices may be common, these structural changes within the WPE have the potential to greatly improve the health of a group, which now makes up a significant portion of the population and has the potential to achieve significant improvements in public health.

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