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ORIGINAL RESEARCH

Copenhagen Psychosocial "Work Organization and Job Content" as a Higher-Order Construct in Relation to Workers' Health: The Moderating Role of Leadership Quality

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Originality/Purpose: The current study aims to investigate the novel approach of utilizing work organization and job content (WOJC) as a higher-order construct that is one of the domains of the Copenhagen Psychosocial Questionnaire (COPSOQ), examining its relationship with sleeping troubles and somatic stress, while also exploring the moderating effect of leadership quality.

Sample/methods: Snowball sampling technique was used to collect the data in this study, with a population consisting of 360 workers employed in hazardous work environments at poultry feed mills. The structural equation modelling technique was applied to achieve the range of outcomes.

Results: The results reveal that WOJC has a significant negative impact on both psychological (sleeping troubles) and physiological (somatic stress) health factors among poultry workers. Although leadership quality did not moderate the relationship between WOJC and physiological health factors, it did moderate the relationship between WOJC and psychological health factors.

Conclusion/Implications: This study has significant implications for researchers, poultry feed mill owners, policymakers, and regulatory bodies. Additionally, the methodological contribution of utilizing WOJC as a higher-order construct provides unique insights for researchers.

Limitations: Due to COVID-19 restrictions, the data was collected online from one province only; future studies should spread the sampling framework to all provinces with different domains of COPSOQ.

Keywords: poultry, Copenhagen Questionnaire, somatic stress, sleeping trouble, leadership quality

Introduction

According to the 2021 report of the Pakistan Credit Rating Agency Limited (PACRA), with a population of around 220 million, Pakistan holds a prominent position in the global poultry sector. The country's poultry sector is one of the largest agri-based sectors of the economy, with over 15,000 poultry farms spread across the country. The COVID-19 pandemic posed some serious threats to the poultry sector, mainly to the small farmers who were compelled to close their farms as poultry demand was low while feed prices were too high. The situation was largely turned around in FY21, with eased lockdown restrictions fostering poultry demand and international price stability of poultry input. On one side, Pakistan ranks in the 11th position among the largest poultry producers in the world, employing more than 1.5 million people in the country. However, on the other side, the challenging working conditions for the physiological and psychological health of the workers are also of great concern.

The psychosocial work environment plays a significant role in the health and wellbeing of the workers operating at any level of the industrial and organizational segments, in both developed and developing countries. As per the statistics,[1] poultry is among the most important agricultural segments in Pakistan, with a 1.3% contribution to national GDP.

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However, the workers operating in poultry farms face constant threats to their physiological health, such as somatic stress, and psychological health, such as sleeping issues, owing to psychosocial factors in the workplace along with infrastructural and policy deficits for workers' safety. Not only this but the composition of air contaminants in buildings confining poultry is determined by factors like ventilation, management practices, animal feeding practices, types of animals, and waste management[2] and significantly affects poultry workers' health. The prevalence of viral pathogens[3] which contribute to the occupational risk of avian influenza infections in poultry workers is around 21.1–47.8% for H7 and H9 strains, in poultry farms across Pakistan.[4] The workers are also at risk of health hazards caused by the bacteria Salmonella, which is present in poultry animals.[5] The presence of fungi, particularly molds, gives rise to work-related symptoms of irritation of the eyes, nose, and skin.[6] Infectious diseases bring with them the element of fear,[7] which increases the impact of such diseases[8,9] and lays the foundation for psychological disorders.[10–12] In developing countries like Pakistan, mental health is the most neglected area of holistic health, with 10–16% of the population suffering from psychological disorders and more than 90% of people having mental health concerns, all which are untreated.[13] It has been found that volatile organic compounds released during waste decomposition and extensive utilization of solvents result in increased concentration of these compounds in the blood of the workers, posing an additional threat to their health which is aggravated owing to lack of awareness and training.[14] Generally, the perceived health of workers from the poultry industry is poor, which is related to psychosocial constraints that include pressing work demands, inadequate resources for remuneration and lower prospects for career growth, and unregulated work hours which disrupt sleep cycles.[15] Moreover, in industrial poultry feed workers, exposure to noise and dust increases the level of oxidative stress.[16]

Theory Building

Over many years, multiple international agencies around the globe, such as the International Labour Organization (ILO), World Health Organization WHO) and European Agency for Safety and Health at Work (EU-OSHA), have recognized the importance of balanced and well-designed work organization and job content, that is, the psychosocial work environment.[17–20] A common phenomenon is a stable psychosocial work environment with well-designed work organization and job content (WOJC), which is appropriately aligned with the capabilities and skills of the workers and not only enhances their psychological health and wellbeing but also improves productivity and retention - which benefits both individuals and organization. WOJC is one of the domains of the Copenhagen Psychosocial Questionnaire (COPSOQ), which consists of influence at work, possibilities for development, variation of work, control over working time, and meaning of work.[21]

WOJC is one of the domains in the third version of COPSOQ and has five different dimensions.[21] The authors in this research have explained each dimension in lieu of the given definitions and the details of each item for better understanding and theory building. Influence at work by definition "deals with the degree to which the employee can influence aspects of work itself, ranging from, eg, planning of work to, eg, the order of tasks". Influence at work assesses the worker's perception of their degree of influence in decision making, work processes, assignments, nature of tasks performed, and the methods used to perform their duties. Possibilities for development is defined as whether "tasks are challenging for the employee and if tasks provide opportunities for learning, and thus provide opportunities for development not only in the job but also at the personal level. Lack of development can create apathy, helplessness, and passivity." Possibilities for development basically delves into workers' growth and skill enhancement. It examines the extent to which workers have opportunities for learning, development of skills and utilization of such within their work context. Variation of work by definition "deals with the degree to which work (tasks, work process) is varied or not, that is, if tasks are not repetitive or repetitive". The integral aspect of any job is to explore whether it's comprised of diverse tasks and responsibilities or is simply repetitive actions. This awareness of the work dynamics provides invaluable insight into the entire work experience. Control over working time is defined as "the degree to which the employee can influence conditions surrounding work, eg, breaks, length of the working day, or work schedules." Assessing the degree of control individuals have over their working time is a crucial element in evaluating the flexibility and autonomy of the job. The level of control determines how employees achieve their work–life balance by choosing their breaks, holidays, and casual conversation with co-workers. Finally, "Meaning of work concerns both the meaning of

the aim of work tasks and the meaning of the context of work tasks. The aim is 'vertical', ie, that the work or product is related to a more general purpose, such as healing the sick or to produce useful products. The context is 'horizontal,' ie, that one can see how one's own work contributes to the overall product of the organization." This understanding of how the job is linked to creating value in the process motivates employees to reflect deeper. Seeing that their job is meaningful fosters a sense of fulfilment that they are making a difference, not in their life but in contributing to a larger perspective. This sense of realization leads to the well-being of employees, creates greater satisfaction in the job, and fosters a sense of purpose and engagement in the workplace.

Psychosocial work environment factors such as work overload, repetitive work tasks, less control over time, nature of work, and possibilities for growth can result in sleep deprivation[19] and other sleeping issues.[22] This becomes a cyclic relationship when interacting with stress enhances mental health issues.[23] Kalmbach et al[24] discussed sleep reactivity – the effect of stress on sleep. The authors found that individuals with high levels of sleep reactivity are more prone to sleep disturbance when stressed out. Sleep disturbance also tends to aggravate respiratory infections and somatic stress, the manifestation of which is increased to a great extent in shift workers.[25] Sleep disturbance is also prevalent in low and unskilled workers.[26] Many people, especially working adults, who have a high risk of developing work stress and complex social responsibility have trouble sleeping[27] and other job concerns.[28,29] Issues about career and job are also associated with troubles with sleep quality. In addition to sleep deprivation, psychosocial factors are also a significant predictor of somatic health complaints,[17] symptoms of which increase with long working hours.[18] One of the studies conducted by Lgboanugo et al[30] found that work-related psychosocial factors are significantly associated with physiological parameters and somatic stress in firefighters and suggested interventions in the form of different resourceful strategies such as social support and self-efficacy.

According to job demands and resources theory, while working in such conditions is inherently stressful and affects health, the psychosocial work environment also plays a role in the health and well-being of employees when the provided resources are enough to mitigate the negative effects of job demands. The moderating role of the quality of leadership in terms of supervisory support can mitigate these negative effects; that is, support from an authority figure or leader can play an inhibitory role for stress and somatic complaints.[23] Where the perception of the work environment is affected by personality traits,[30] supervisory leadership support and congenial peer relationships contribute to a better psychosocial work environment.[24,25] Quality of leadership in terms of the highly supportive role of the supervisor is also an important factor for occupational health and safety, particularly in hazardous working environments such as the poultry industry. Transformational leadership coupled with high-quality leader–follower interaction is positively related to mental health.[31]

Despite this, little research is available on psychosocial risks faced by poultry workers which affect their holistic health from a physiological and a psychological perspective. The WOJC is hypothesized in such a way that if the workers have less control over the psychosocial WOJC factors, such as influence at work, possibilities for development, variation of work, control over working time, and meaning of work, then the workers' misery further increases in terms of psychological health (ie, sleeping trouble) and physiological health (ie, somatic stress). This relationship can be moderated with the quality of leadership as a job resource factor in line with the Job Demands-Resources (JD-R) theory, which is shown in Figure 1. Therefore, the study hypotheses are:

H1: WOJC has a significant negative impact on somatic stress.

H2: WOJC has a significant negative impact on sleeping trouble.

H3: Quality of leadership has a significant negative moderating effect on the relationship between WOJC and somatic stress.

H4: Quality of leadership has a significant negative moderating effect on the relationship between WOJC and sleeping trouble.

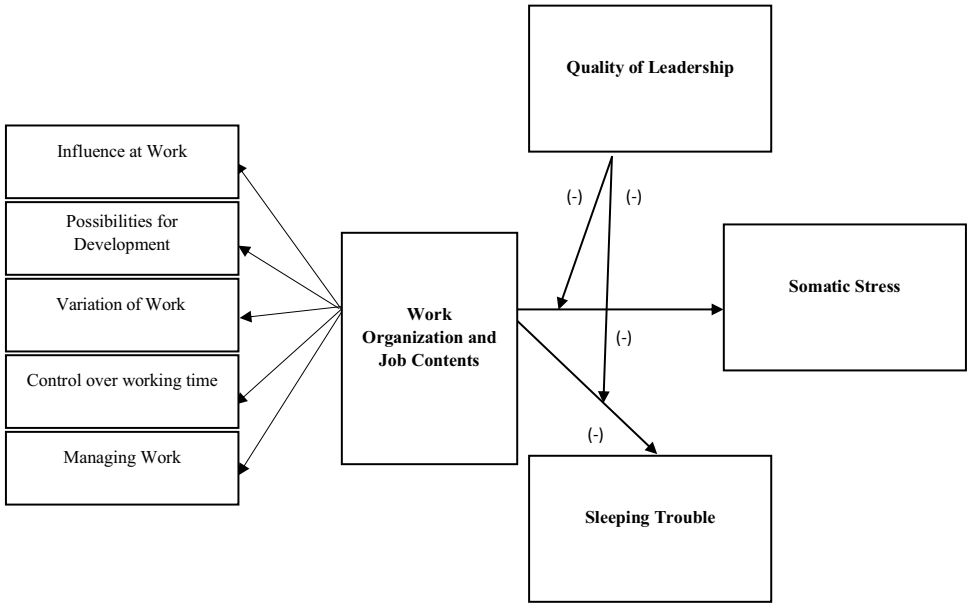

Figure 1 Hierarchical Component Model based on Psychosocial Work Environment.

Methods

Sample and Procedure

A total of 410 back-and-forth (English–Urdu–English) translated bilingual surveys were received through snowball sampling at the entrance to registered poultry firms in Punjab. Collecting the data from workers was hard mainly because of the pandemic standard operating procedures (SOPs) and the geographically dispersed population. Though no clinical trials were conducted on the participants involved in this survey study, approval was nonetheless obtained from the ethical institutional review board of Lahore Garrison University (approval number: 2023-EIRB-004). Moreover, respondents' confidentiality was properly maintained and kept anonymous and a consent form of participation in the study was obtained from each participant before proceeding to complete the survey. The data on the survey was collected during the time of COVID-19, therefore a survey was considered more appropriate and was initially sent to 100 poultry feed mills to the available email addresses, with a request to further disseminate the survey amongst the workers. However, due to low response in the first phase, it was decided to select cities with at least 05 operational poultry feed mills and having more than 25 workers in each selected mill. Therefore, we started with the poultry mill which was fulfilling the inclusion criteria and fortunately one of the co-author's students was working in that mill. Thereafter, referrals were made as a part of snowball sampling. One representative having at least a degree was requested from each selected mill to help the researcher with data collection. Therefore, Jhang, Vehari, Lodhran, Pakpattan, Attock, Mianwali, Bahawalpur, Rahim Yar Khan, Toba Tek Singh, and Chakwal were excluded from the sample collection. After this, the process of collecting data was made rigorous with multiple calls and reminders in emails sent to selected mills. A total of 360 responses were finally used. Table 1 shows the demographic characteristics of study respondents. As all the measures used in this study were collected through the same instrument, Herman's test was applied to overcome common method bias.

The recommended two-stage analytical practice for measurement and structural models of the study were assessed with the structural equation modeling technique using partial least square approach, SmartPLS,[26] which was used to test the research framework. To overcome the complexities of the hierarchical component model, we found this software to be the most user friendly for accessing the range of outcomes. To analyze the results, first this study examines the measurement model, which presents the reliability, validity, and factor loading of constructs. After attaining the satisfactory results of the measurement model, this study then analyzes the structural model which presents the significance of relationships between variables.

Measures

The COPSOQ was adapted for the study. This is the first study in which Work Organization and Job Content (WOJC) is taken as a higher-order construct, with a total of 18 items. The adapted dimensions of WOJC as independent constructs are Influence at Work (IN – 06 items), Possibilities for Development (PD – 03 items), Variation of Work (VA – 02 items), Control over Working Time (CT – 05 items) and Meaning of Work (MW – 02 items). Two dependent variables of the study are Somatic Stress (SO – 04 items) and Sleeping Trouble (SL – 04 items), while Quality of Leadership (QL – 04 items) was chosen as a moderator in this study. See Appendix for detailed study questionnaire in both English and Urdu. This study provides several theoretical and methodological contributions. First, this study contributes to the job demands of JD-R theory, which includes factors such as influence at work, possibilities for development, variation of work, control over working time, and meaning of work,[21] by establishing a hierarchical component model (HCM). Second, the study has incorporated a top-down ie, deductive approach, for the WOJC, which consists of different components of the COPSOQ. This approach will help the researcher in understanding the additional insights regarding the effect of different components embedded in a specific WOJC construct. Therefore, WOJC is defined as the control over aspects of work and working time, personal and professional development, and variety in tasks along with the meaning of work in terms of its applicability and benefits for others.

Results

We applied the formative–reflective model and measured WOJC in a new dimension as a higher-order construct following the structural equation modelling two-step technique. Table 2 shows the significance of reliability and validity through item weights and loadings[32] and multicollinearity assessment.[33] The results in Table 3 show the achievement of minimum cut-off values of the variance inflation factor (VIF), average variance extract (AVE) and composite reliability (CR).[34]

The diagonal values shown in Table 4 of the Fornell–Larcker are greater than other table values, meeting the standards. The results of HTMT ratios in Table 5 show that the values are below the threshold of 0.85 and highlight the reflective construct's discriminant validity.[35] Hence, step one of the Structural Equation Modeling (SEM) techniques is achieved and helped us to move forward to the second step in which we analyzed the research hypotheses.

The Structural Model

The empirical results of the structural model are presented in Figure 2. The result proposes that a large percentage of the variance (44.3%) in sleeping trouble is elucidated by WOJC, followed by only 17.4% for somatic stress. As reported in

Table 1 Overview of Respondent Demographics

Respondent Demographic Total	Frequency 360	% 100
Gender		
Female	49	13.6
Male	311	86.4
Age		
18–25	75	20.8
26–39	180	50.0
40+	105	29.2
Cities		
Multan	22 (56)	15.5
Lahore	05 (63)	17.5
Rawalpindi	08 (40)	11.1
Sahiwal	06 (47)	13.0
Sheikhupura	07 (35)	9.7
Faisalabad	07 (39)	10.8
Okara	05 (20)	5.5
Kasur	08 (27)	7.5
Gujranwala	07 (33)	9.2

Table 2 Formative Measure Items, Weights and Loadings

Construct	Items	Weight	t-values	Loading
WOJC	CT	0.520	4.413	0.863
	IN	0.362	3.267	0.791
	MW	0.448	3.749	0.818
	PD	0.327	3.071	0.765
	VW	0.424	3.494	0.798

Table 3 Reliability and Validity

	Cronbach's Alpha	CR	AVE	Factor Loading	VIF
CT	0.913	0.972	0.873	0.869–0.962	2.99–3.68
IN	0.909	0.975	0.866	0.806–0.954	1.72–2.31
MW	0.881	0.944	0.894	0.939–0. 952	1.94–4.18
PD	0.882	0.924	0.803	0.848–0.956	1.82–3.76
QL	0.948	0.962	0.864	0.868–0.973	2.27–3.65
ST	0.882	0.918	0.738	0.825–0.890	2.98–4.38
SO	0.831	0.864	0.729	0.763–0.868	2.16–3.95
VW	0.780	0.863	0.763	0.737–0.901	1.64–3.73

Table 4 Fornell–Larcker Criterion

	QL	SO	ST	WOJC
QL	0.929			
SO	−0.183	0.858		
ST	−0.194	0.368	0.859	
WOJC	0.008	−0.372	−0.619	0.551

Table 5 Heterotrait–Monotrait Ratio (HTMT)

	QL	SO	ST	WOJC
QL				
SO	0.191			
ST	0.208	0.404		
WOJC	0.089	0.513	0.884	

Table 5, except for one moderating hypothesis, ie, H3 is not supported, all remaining study hypotheses are supported. WOJC was significantly negatively associated with SO (β = −0.370, t-value = 6.761, p = 0.000), hence hypothesis H1 is supported. Similarly, WOJC has a significant negative association with ST (β = −0.616, t-value = 23.811, p = 0.000) and therefore supports hypothesis H2. The results of moderating hypothesis H3 shows that QL has an insignificant negative effect on the relationship between WOJC and SO (β = −0.058, t-value = 1.1778, p = 0.239), rejecting the hypothesis. The moderating effect is also shown in Figure 3. Furthermore, QL has a significant negative effect on the relationship between WOJC and ST (β = −0.161, t-value = 4.460, p = 0.000), which supports moderating hypothesis H4. The moderating effect is also shown in Figure 4. Table 6 presents the path coefficient (β) value and the significance values of all direct relations and moderating analyses.

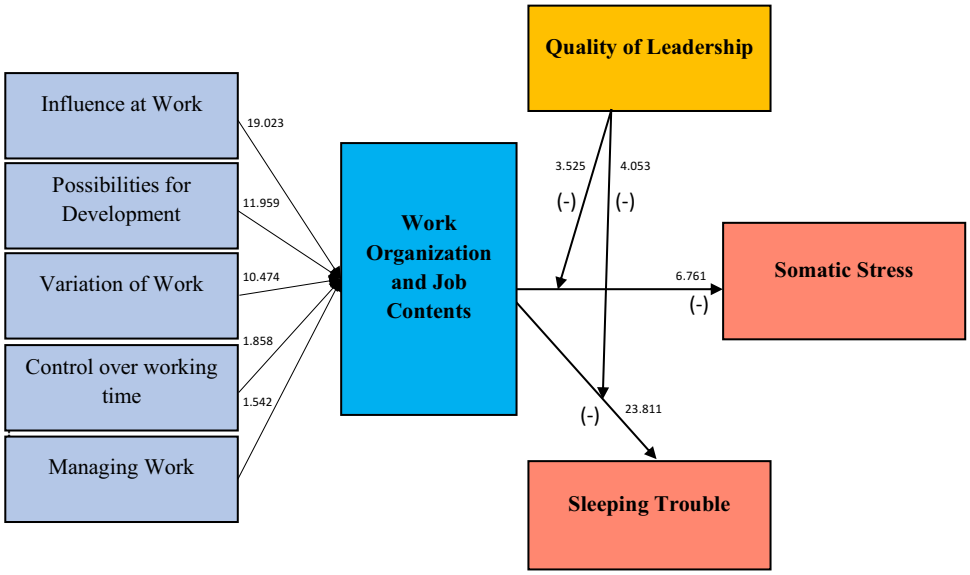

Figure 2 The Structural Model.

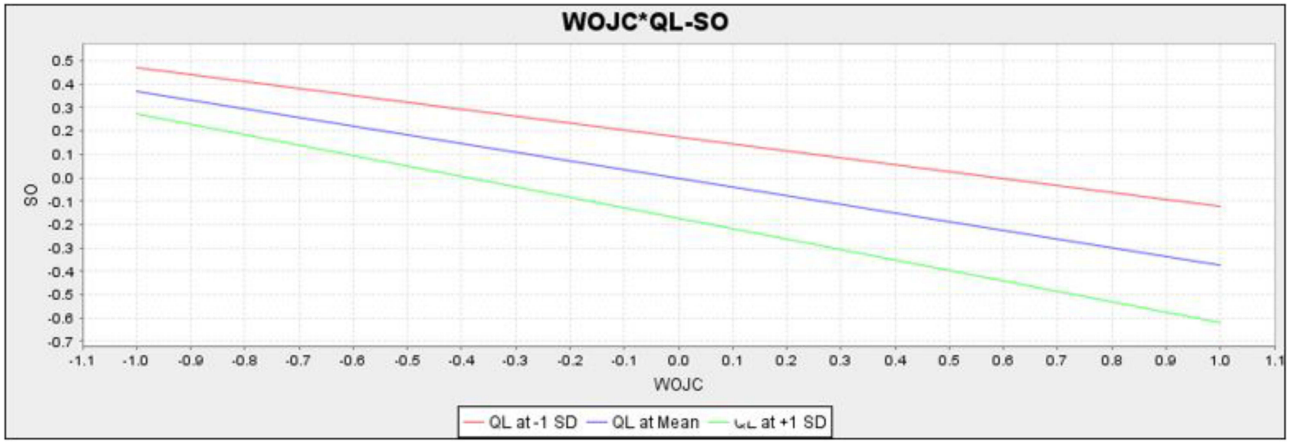

Figure 3 Moderation – WOJC*QL-SO.

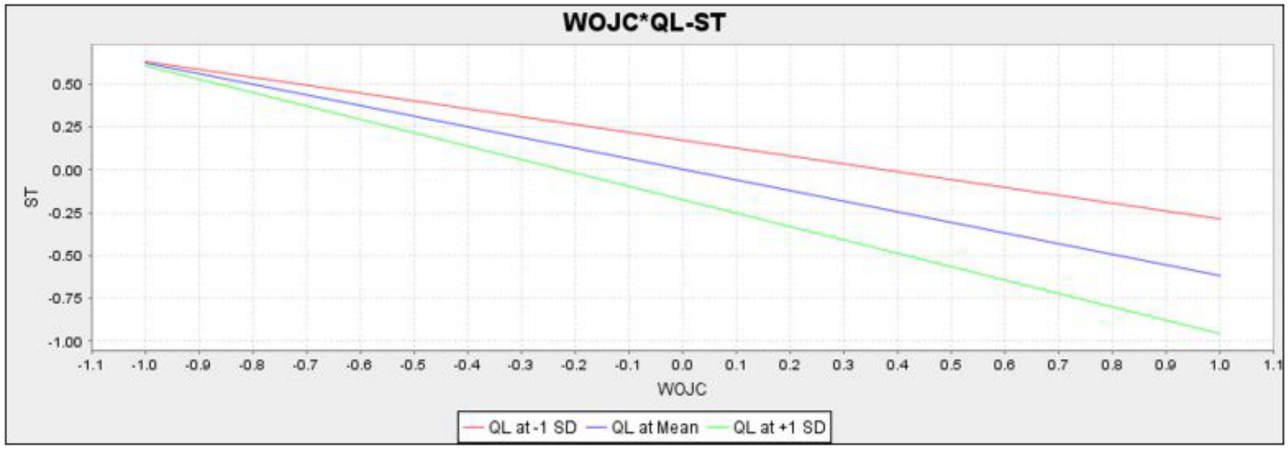

Figure 4 Moderation – WOJC*QL-ST.

Table 6 The Structural Model

	Original Sample	t-values	p-values	Decision	R^2
QL -> SO	−0.174	3.525	0.000	Supported	
QL -> ST	−0.173	4.053	0.000	Supported	
WOJC -> SO	−0.370	6.761	0.000	Supported	
WOJC -> ST	−0.616	23.811	0.000	Supported	
WOJC*QL-SO -> SO	−0.058	1.178	0.239	Not-Supported	0.174
WOJC*QL-ST -> ST	−0.161	4.460	0.000	Supported	0.443

Discussion and Conclusion

The main objective of the paper was to examine the effects of work organization and job content as a higher-order construct on the poultry workers' physiological and psychological health with a moderating effect on the quality of leadership.

Results of statistical analysis show that job content and work organization factors have a significant negative impact on both sleeping troubles (psychological health) and somatic stress (physiological health) of poultry workers in Pakistan. These findings are in line with previous research.[15–18] This negative impact is particularly due to factors like excessive workload, limited opportunities for career growth, and less control over work and working hours.[19–21] These combined factors collectively lead to poorer mental health.[23]

Quality of leadership does not moderate the relationship between WOJC and physiological health factors, ie, somatic stress. This finding is different from previous studies[23–26] that have shown the impact of leadership. This is possibly because physiological health is associated with physical environmental factors rather than with psychological support from leaders. Also, a poor working environment with the presence of hazards[27] causes more harm to physiological health[9,28] than could be mitigated by quality of leadership.

On the other hand, quality of leadership was found to moderate the relationship between WOJC and psychological health factors ie, sleeping trouble. These findings are supported by existing literature.[25] Also, the sleeping disturbance is generally on the rise in low-income countries like Pakistan, and social factors, support from others along with demographic characteristics play a role in it.[30] At the workplace leaders through the quality of their leadership get to buffer the impact of WOJC on sleeping trouble.

Education is key to ensuring the poultry workers' health and wellbeing. We have found that the majority of the workers working in poultry mills and farms are primary or matriculation degree holders. Therefore, the supervisory role becomes more critical. A well-equipped, understandable, and knowledgeable supervisor can limit the harmful effect of WOJC on workers' health. In other words, early recognition, reporting, and psychosocial job resource interventions such as supervisory support in relation to psychosocial job demands can limit the physiological and psychological health concerns, improve the effectiveness of workers, minimize the likelihood of workplace injuries, and ultimately reduce the compensation claims of poultry workers.

We recommend an effective medical management program to run on-site for better health assessment, in addition to best practices such as WOJC pressure handling techniques for workers as a part of regular training; additional hands-on practice for automation as technology becomes available to reduce lag times; and supervisors to be equipped with full-time international safety standards to monitor health and safety concerns. Considering the significant negative effect of WOJC on workers' health, we recommend medical surveillance and up-to-date records on workers' injury and illness, early recognition reporting and monitoring, systematic evaluation and referrals, conservative treatment and return to work, and finally adequate staffing and facilities at the workplace. Looking at the significant moderating role of quality of leadership, it is further recommended that, upon hiring, workers should receive a letter of instructions from supervisors to help with the discomfort associated with the adjustment of WOJC variables to the job. During telephone discussions, we have been informed by most of the representatives that they had only one regular scheduled rest break per day. Workers rotating between different activities would be unlikely to receive sufficient breaks to have both mental and physical rest and earlier research has found that limiting continuous work to less than 2 hours reduced the risk of injury. The study was

conducted during the pandemic, meaning it measured the effect of WOJC on health outcomes and exposures at a single point in time. This may either result in underestimation or overestimation of WOJC using an HCM in studies that plan to be conducted for longitudinal data collection. Also, this study is primarily focused on COPSOQ's psychosocial work environment WOJC components, which may not fully address the impact of physical exposure on the workers' physiological health, especially somatic stress which is one of the endogenous constructs of this study. Moreover, future studies should consider shift workers as a part of their study sample for further evaluating WOJC as an HCM.

This study in many ways adds gains for policymakers as practical implications and contributes to literature to assist theorists as theoretical implications. Promoting safe and healthy workplaces, inline and ensuring the occupational health and safety laws by the policy makers, has an immense reward for both workers and businesses which includes, but is not limited to, increased productivity, consistent product quality, improved employee morale, and reduced absenteeism, as well as reduced expenses associated with injury and illness. Similarly, for theorists, COPSOQ III constructs were adapted for this study. Due to COVID-19 restrictions, the data was collected online from one province only; future studies should spread the sampling framework to all provinces with different domains of COPSOQ. This is the first study in which WOJC is taken as a higher-order construct, with a total of 18 items. WOJC as an HCM will help future researchers to limit the structural model relationships, making the SmartPLS model more parsimonious, reducing collinearity issues and solving discriminant validity issues as proven by the study results.

Finally, the psychological, and physical health of poultry workers is at stake in developing countries like Pakistan owing to deficits in management, infrastructure, psychosocial factors, and government policies. This research will not only lay ground to understand the determinants of poultry workers' health in an organizational setting but will also provide insights for organizational leadership as well as regulatory bodies to develop policies to provide safe organizational environments and practices for the physical as well as psychological well-being of employees. As the employees spend most of their time at work in a hazardous environment, implementing solutions and safe practices would prove to be beneficial for their holistic health and benefit the organization through increased motivation and resulting productivity. The methodological contribution of using WOJC as a higher-order construct will give different insights to the researchers who are interested in using COPSOQ.

Data Sharing Statement

Data generated or analyzed during the study are available from the corresponding author on request.

Ethical Approval

Approval obtained from the ethical institutional review board of Lahore Garrison University (approval number: 2023-EIRB-004).

Disclosure

The authors report no conflicts of interest in this work.

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