RESEARCH   **Open Access**

Impact of job crafting and work engagement on the mental and physical health of palliative care nurses

Ateya Megahed Ibrahim[1,2]*, Donia Elsaid Fathi Zaghamir[3,4], Mohamed Gamal Elsehrawy[1,5], Hassanat Ramadan Abdel-Aziz[1,6], Samia Eaid Elgazzar[7], Fathia Gamal Elsaid Hassabelnaby[8], Heba Ahmed Osman Mohamed[9]* and Nahed Abd Elazeem Abd Elsalam[2]

Abstract

Background The concept of job crafting and work engagement, which encompasses the proactive modifications that employees make to their tasks, relationships, perceptions, and level of involvement in their work, has been demonstrated to exert a significant influence on both mental and physical health. For nurses working in palliative care, the implementation of such modifications and active engagement in their roles could serve to mitigate the demanding nature of their work and improve their overall well-being. Nevertheless, there is a paucity of research examining the combined impact of job crafting and work engagement on the health outcomes of palliative care nurses.

Aim This study aimed to evaluate the relationship between job crafting, work engagement, and the mental and physical health outcomes of palliative care nurses in an oncology setting.

Methods A cross-sectional design was used to examine the relationships between job crafting (independent variable), work engagement (mediating variable), and health outcomes (dependent variables: physical and mental health). Mediation analysis was conducted to explore the role of work engagement in the relationship between job crafting and health outcomes. The study was conducted in the oncology department of Zagazig General Hospital in Egypt, with a stratified random sample of 100 registered nurses who had at least six months of experience in palliative care. Data were collected using the Job Crafting Scale (JCS), Utrecht Work Engagement Scale (UWES), the Depression, Anxiety, and Stress Scales (DASS-21), and the Short Form-36 Health Survey (SF-36).

Results The study revealed a positive correlation between job crafting behaviours and physical health ($r = 0.52$, $p < 0.001$) and a negative correlation between job crafting behaviors and mental health distress ($r = -0.56$, $p < 0.001$). The structural equation modeling (SEM) results demonstrated significant paths from job crafting to both physical health ($\beta = 0.40$) and mental health distress ($\beta = -0.45$), indicating that job crafting positively affects physical health and negatively affects mental health distress. Mediation analysis revealed that work engagement significantly

*Correspondence:
Ateya Megahed Ibrahim
ateyamegahed@yahoo.com
Heba Ahmed Osman Mohamed
heba.mohmmed@nbu.edu.sa
Full list of author information is available at the end of the article

mediated the relationship between job crafting and health outcomes. Specifically, higher work engagement positively influenced health outcomes, while the negative effects of job crafting on mental health distress were lessened.

Conclusion Job crafting positively impacts the physical and mental well-being of palliative care nurses by fostering greater work engagement. This engagement mediates the relationship between job crafting and health outcomes, enabling nurses to better cope with occupational stressors. By adapting their work environment to suit their strengths and preferences, nurses experience improved health and job satisfaction. As a result, higher work engagement not only enhances nurse well-being but also contributes to better patient care, as engaged nurses are more capable of providing compassionate, effective care.

Clinical trial No clinical trial.

Keywords Job crafting, Palliative care, Mental health, Physical health, Work engagement

Introduction

The nursing profession, particularly in palliative care, is typified by elevated emotional demands and intricate patient requirements [1–3]. Palliative care nurses provide invaluable assistance to patients and their families confronting a serious illness. They facilitate not only the management of the physical symptoms associated with the disease but also the navigation of the emotional and psychological implications. The multifaceted nature of this role can result in significant pressure on nurses, which may in turn lead to stress, burnout, and compromised mental and physical health. It is therefore of paramount importance to gain an understanding of the factors that can enhance their resilience and well-being [4–7].

One promising concept in this context is job crafting, which refers to the proactive changes that employees make in their roles with the intention of enhancing their job satisfaction and engagement [8–12]. Job crafting enables nurses to assume greater control over their work by modifying the tasks they perform, their interactions with colleagues, and their own perceptions of their roles [13–15]. The practice of job crafting may assist nurses in fostering a greater sense of agency in their work, which could in turn mitigate feelings of helplessness and overwhelm that can arise in palliative care settings [16–19].

The evidence suggests that job crafting can indeed contribute to improving several employee health indicators, including mental health. If nurses can choose what kind of work they do, they are less likely to suffer from stress and are more likely to be satisfied with their jobs [20–22]. The latter is a major contributor to the mental health status of nurses. It is also necessary to mention the link between physical and mental health because mental health issues can manifest in the physical domain as well, and this is one of how the mental health of healthcare workers can affect the physical health profiles of patients [23–26].

The specific challenges faced by palliative care nurses require a more in-depth investigation of the effect job crafting has on the mental and physical state of individuals. As caring for patients at the end of life is associated with a significant emotional burden, nurses who engage in job crafting on their initiative could have an increased ability to cope with the stressors that are a part of their role [27–30]. Understanding how job crafting impacts health outcomes can help healthcare organizations create environments that are conducive to promoting the wellness of nurses by motivating them to craft their roles to align with their personal goals and values [28–34].

In addition, it is critical to examine the mediating factors of the given variables. The investigation of the mediating factors, such as work engagement, is necessary to understand how the job crafting can be related to the improved health outcomes [10, 19, 29–38]. Work engagement has been proven to be associated with the positive emotional experiences and a sense of fulfilment and motivation at work. By examining the work engagement in the context of job crafting, it is possible to better understand the mechanisms of how it can affect the health outcomes. This logic allows one to claim that the work engagement is one of the critical factors that contribute to the mental and physical health outcomes of nurses [39–42].

As the healthcare landscape undergoes a process of transformation, there is an increasing focus on the comprehensive well-being of healthcare professionals. It is important to prioritize the mental and physical health of nurses, not only for their own benefit but also to ensure the quality of care they provide to patients is maintained. Therefore, an understanding of the implications of job crafting in the context of palliative care nursing has significant implications for both nursing practice and healthcare systems.

Theoretical framework

The Job demands-resources (JD-R) theory is the framework of the study. The JD-R theory, founded by Demerouti et al. [43], posits that every job has its own specific job demands (e.g. physical demands, psychological demands, social demands, and organizational demands)

and job resources (e.g. support, autonomy, opportunities for development). The two interact to cause the outcomes which include motivation, job satisfaction, engagement, burnout, and health of the employee. Job demands lead to burnout and exhaustion, and job resources buffer the negative impact of job demands and promote the positive outcomes like work engagement [43].

In terms of palliative care, nurses have increased job demands due to the emotional and physical strain of providing care to a patient at the end of their life. High job demands often lead to stress and burnout, but according to the JD-R theory, enhancing job resources (including autonomy through job crafting) can minimize such effects, even improving nurses well-being. Therefore, job crafting is considered a resource that can help to reduce burnout and improve health outcomes because it allows nurses to adjust their role to minimize the emotional demands they must face [44].

The JD-R model also implies a cycle. The cycle begins when the job demands go up without the necessary job resources. This makes the individual strained and in turn, lacking in engagement and in a subsequent turn, bad health outcomes. On the flip side, job resources are present. In this case, the employees are likely to more than just survive, leading to good job outcomes such as improved mental and physical health. This cycle is important in explaining how job crafting may be related to good health outcomes among nurses practicing in palliative care [45].

Conceptual model

The conceptual model combines job crafting, work engagement, and health consequences. As a result, the conceptual model shows the way job crafting adds to the relationship between job demands and job outcomes. In the conceptual model, job crafting is considered a job resource that can buffer the impact of stressors in the palliative care setting.

1. Job crafting is a term that describes a proactive process where employees change their tasks, interactions, and cognitive perception of their work to make it more meaningful and manageable. In palliative care nursing, job crafting can include reducing the emotional load of care, crafting work roles by personal strengths, and seeking social support to cope with stress. This process is associated with the increased perception of control, autonomy, and engagement in work among nurses which can result in reduced stress levels and improved health outcomes [46].

2. Work Engagement: Work engagement is the other important component of the previous model. Work engagement is defined as a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption [47]. Work engagement is key to this model. Work engagement is known to have a positive impact on both mental health and job performance as a whole [48]. In this study, it is argued that work engagement mediates the relationship between job crafting and health outcomes. If the nurses actively craft their jobs, they will be engaged in their work, which would increase their psychological health, which in turn reduces the negative impact of stress. High work engagement is also expected to have a positive impact on health outcomes. High work engagement would lead to reduced burnout and improved physical health.

3. Health Outcomes. In this study, health outcomes refer to mental health (stress, anxiety, burnout) and physical health (fatigue, physical symptoms). According to the conceptual model, job crafting can improve health outcomes by promoting work engagement and reducing stress. For instance, palliative care nurses, who are engaged and have control over their work, should not suffer from burnout and other negative health effects. In addition, if nurses use job crafting to reduce stress, they can experience better physical health resulting in lower levels of fatigue and overall physical health. Thus, job crafting and improved work engagement bring positive health effects, and these health outcomes can be delivered to patients with the care that is provided by the nurses [49].

Aim of the study This study aimed to evaluate the relationship between job crafting, work engagement, and the mental and physical health outcomes of palliative care nurses in an oncology setting.

Research questions

1. What is the relationship between job crafting and the mental and physical health outcomes of palliative care nurses?
2. Does work engagement mediate the relationship between job crafting and health outcomes in palliative care nurses?
3. How do different dimensions of job-crafting influence work engagement and overall well-being in palliative care nurses?

Methods
Study design

This study used a descriptive, cross-sectional approach to assess how job-crafting relates to work engagement and mental and physical health among palliative care nurses. The use of this research design allowed for the gathering

Ibrahim *et al. BMC Nursing*   (2025) 24:404

Page 4 of 11

of data at one point in time, which helped to identify relationships that exist between job crafting behaviours and health.

Universe of the research

The universe of the study involved all palliative care nurses in the oncology department at Zagazig General Hospital, Egypt. The nurses' role is to offer specialized care to patients with conditions that limit their lives. The nurses also experience other job-related factors that have an impact on their psychological and physiological health.

Setting

The study was carried out in the oncology department of the Zagazig General Hospital in Egypt, which had comprehensive palliative care services. The choice of the setting was appropriate since the hospital served a considerable population of patients requiring palliative care. The nurses also faced unique job demands and challenges that adversely affected their mental and physical health. The oncology department of the hospital had the necessary resources and personnel required to conduct the research and ensure the participation of all eligible nurses.

These nurses also experienced a variety of stressors, such as regulating end-of-life care, coping with the emotional consequences of patient suffering, managing high patient-to-nurse ratios, and working long hours. Consequently, these stressors commonly result in high levels of emotional exhaustion, compassion fatigue, and physical strain. To regulate their stressors, the nurses provided job crafting, where they adjusted their job demands and resources to enhance their job experience and well-being.

Four dimensions of the Job Crafting Scale are as follows: the structural job resources (1) Increasing (acquiring) developmental job resources (e.g., professional development opportunities, improving work processes); (2) increasing social job resources (e.g., improving relationships with colleagues and patients to receive emotional and professional support; (3) increasing challenging job demands (i.e., job demands challenging to acquire for nurses to induce growth); (4) decreasing hindering job demands (i.e., decreasing stresses and administrative burdens). To enhance work engagement, reduce stress, and improve health outcomes, it is important to understand the dimensions of job crafting in the context of palliative oncology nursing.

Sample size and sampling technique

The sample size for this study was recalculated using G*Power software based on an anticipated medium effect size (Cohen's d = 0.5), a significance level of 0.05, and a statistical power of 0.80. The calculation indicated that a minimum sample size of 100 participants was required to detect a significant effect of job-crafting on health outcomes. To ensure the sample was representative of the nursing population, a stratified random sampling technique was employed. to job crafting.

Recruitment process

The participants were recruited using a formal invitation, which was sent to the participants through the hospital's communication channels. The formal invitation briefly explained the objective of the study and the criteria for eligibility. Other methods of recruitment included posting recruitment flyers in the staff areas within the Oncology department. The recruitment of the participants also involved the engagement of the nursing supervisors through face-to-face discussions. The engagement was to encourage the participation of the participants and address any questions that the nursing supervisors might have had regarding the research. To enhance participation, reminders were sent to the participants in their emails and posted in the areas that were common among them. The period of data collection for this study was between May and August 2024. The period was when the participants were recruited, consented, and given the tools to complete the survey. The period ensured that the data collected was comprehensive and uniform. The period also indicated that the study had achieved the required response rate. The information collected during the period was also sufficient for the completion of the research.

Inclusion and exclusion criteria

The study's inclusion criteria were designed to select participants with relevant experience and active involvement in patient care within the oncology setting. The study included registered nurses who had worked in the oncology department of Zagazig General Hospital for a minimum of six months, thereby ensuring sufficient exposure to palliative care. Furthermore, the nurses were required to be directly involved in patient care and job crafting activities. In order to ensure the contributions of participants were aligned with the study's objectives, exclusion criteria were established.

The exclusion criteria involved nurses who held administrative and educational positions, nurses with less than six months of experience in the oncology department, nurses in prolonged absence during the study period, and part-time nurses. These criteria have been designed to guarantee the representation of the sample of experienced, full-time, direct-care providers, and to enhance the credibility of the study concerning the role of job crafting in oncology nursing.

Data collection tools

Job crafting scale (JCS)

Job Crafting Scale (JCS) is a self-report instrument that was created by Tims et al. [49], to assess job crafting behaviours. JCS measures the extent to which employees proactively alter their job tasks and interactions in order to increase the level of job satisfaction, job engagement, and job performance. JCS is based on four factors that include: increasing structural job resources, increasing social job resources, increasing challenging job demands, and decreasing hindering job demands. The JCS consists of 21 items. The answers are measured on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). High scores on the JCS mean that the employee behaviour of job crafting is also high. The JCS had good internal consistency. Cronbach's alpha was 0.85 for the overall scale and varied between 0.77 and 0.85 for each of the subscales. The construct validity of the JCS was tested against such variables as job satisfaction, work engagement, and well-being indicators [49].

Utrecht work engagement scale (UWES)

The Utrecht Work Engagement Scale (UWES) which was created by Schaufeli et al. [50] is a self-report questionnaire that measures work engagement. The UWES includes three latent (not directly observable) dimensions of the work engagement construct: Vigor (i.e. high energy and resilience at work), Dedication (i.e. a sense of significance, enthusiasm, and inspiration), and Absorption (i.e. being fully concentrated in the work). All three of these dimensions are measured by the UWES. The short version of the UWES (UWES-9) is a nine-item questionnaire assessing the level of work engagement on a 7-Âpoint-like scale ranging from 0 (never) to 6 (always/ every day). Higher scores mean higher work engagement. The UWES-9 is a widely used instrument in occupational health research. It has been validated in all healthcare sectors. The coefficient of internal consistency for the UWES-9 was 0.88, indicating that it has high reliability [50, 51].

Depression anxiety stress scales (DASS-21)

The Depression Anxiety Stress Scales (DASS-21) was first created by Lovibond and Lovibond [52]. The DASS-21 is a short-form self-report assessment for measuring the three related negative emotional states of depression, anxiety, and stress. The tool is widely implemented in clinical and research settings to determine the levels of psychological distress and identify patients who need mental health interventions. The DASS-21 is a 21-item scale with equal numbers of items for depression (e.g., dysphoria, anhedonia, in life and future); anxiety (e.g., autonomic arousal, skeletal muscle effects, and situation anxiety); and stress (chronic non-specific arousal)

subscales. Each of the 21 items is scored from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time), with scores for each subscale summed and multiplied by two to deliver the final score. Greater total scores indicate a higher degree of depression, anxiety, or stress. In terms of reliability and validity, the DASS-21 has excellent psychometric characteristics. The instrument is reliable, with Cronbach's alpha coefficients being 0.94, 0.87, and 0.91 for depression, anxiety, and stress, respectively. Additionally, the DASS-21 is a valid instrument with strong construct and criterion validity [52].

SF-36 health survey

The SF-36 Health Survey by Ware and Sherbourne [53] has been the most widely used self-report measure to measure health-related quality of life in overall perspectives with equal emphasis on physical, mental, and social well-being. It has 36 questions scoring into 8 scales: Physical Functioning, Role Limitations due to Physical Health Problems, Bodily Pain, General Health Perceptions, Vitality (Energy/Fatigue), Social Functioning, Role Limitations due to Emotional Problems, and Mental Health. The survey also provides two summary scores, Physical Component Summary (PCS) and Mental Component Summary (MCS), giving a rough indication of overall physical health status and mental health status, respectively. Response options for all items range from 0 to 100, with a higher score indicating better health and functioning. The SF-36 is most useful for comparisons of health effects in various groups and changes in health over time. The SF-36 has shown good discriminatory power in distinguishing among different populations, with a published Cronbach's alpha of greater than 0.80 on their respective subscales across all items. It has also been established to have good construct validity based on factor analyses that support its two-component structure. In addition, it shows good test-retest reliability, with coefficients above 0.75 for most subscales, a characteristic that grants it the status of a viable tool to measure health outcomes over time [53].

Ethical considerations

The Declaration of Helsinki's highest ethical standards were followed in this study to protect each participant's rights, privacy, and welfare. Approval was granted by the Faculty of Nursing, Zagazig University, Egypt, with the approval code number (ID/Zu.Nur.REC#:00270). All participants were informed of the study's purpose, procedures, potential risks, and benefits. They were also assured that their participation was voluntary and that they could withdraw at any time without repercussions. The confidentiality of personal data was rigorously maintained, and the data were anonymised to prevent any identifiable information from being linked to individual

Ibrahim *et al. BMC Nursing*   (2025) 24:404

Page 6 of 11

Table 1 Demographic characteristics of participants

Characteristic	Frequency (*n*)	Percentage (%)
Age (mean ± SD)	35.4 ± 8.2	
Gender		
Female	70	70%
Male	30	30%
Years of Experience		
< 5 years	20	20%
5–10 years	50	50%
> 10 years	30	30%
Education Level		
Bachelor's	60	60%
Master's	40	40%

participants. Prior to the collection of data, informed consent was obtained from each participant, ensuring that they were aware of their rights and the objectives of the study. Furthermore, the study adhered to the ethical guidelines and standards for research involving human subjects as set forth by the university's ethics review board and aligned with international best practices in health research ethics.

Statistical analysis

The study employed various statistical techniques to investigate the relationship between job crafting, work engagement, and health outcomes in nurses. A statistical analysis was conducted to answer the research question. The data were analyzed using IBM SPSS version 22.0 (IBM Corp., Armonk, NY, USA) for descriptive statistics and correlation analysis. The structural equation modeling (SEM) analysis was conducted using AMOS for Windows, version 21.0 (IBM Corp, Armonk, NY, USA). A SEM analysis was conducted to evaluate the direct and indirect relationships among job crafting, work engagement, and health outcomes. Descriptive statistics of the demographic variable were performed to understand the general characteristics of the participants, including age, gender, years of experience, and education. To measure the goodness of fit of the model, several model fit indices were assessed. The indices were used to determine the comparative fit index (CFI), root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR), which can be used to test the model-fit indices. These indices were used to perform the measurement model to ensure the validity of the data.

Results

Table 1 shows the demographic characteristics of the sample subjects included in the study. The sample consists of 70% females and the rest are males. The average age of the sample respondents is 35.4 years. The years of experience of the participants vary; 50% have between five and ten years of experience in nursing practice.

Table 2 Descriptive statistics for key variables

Variable	Mean (SD)	Mean per item	Minimum	Maximum
Job crafting (Total Score)	62.5 (11.3)	2.98	35	85
Work engagement	44.2 (10.5)	4.91	25	70
Mental health (DASS-21)	18.7 (5.4)	0.89	8	30
Physical health (SF-36)	74.3 (9.8)	2.06	50	90

Table 3 Confirmatory factor analysis results

Factor	Indicator	Factor loading	*p*-value
Job crafting	Increasing structural job resources	0.78	< 0.001
	Increasing social job resources	0.82	< 0.001
	Increasing challenging job demands	0.75	< 0.001
	Decreasing hindering job demands	0.80	< 0.001
Work engagement	Work engagement	0.80	< 0.001
Mental health	DASS-21	0.85	< 0.001
Physical health	SF-36	0.80	< 0.001

Educationally qualified, the majority of the respondents (60%) have a Bachelor's degree while 40% hold Master's degrees.

Table 2 summarizes the key variables' descriptive statistics as collected in the current study. Job crafting had a mean score of 62.5 (mean score per item = 2.98), indicating moderate levels of engagement in the alteration of work tasks and interactions with others. Work engagement accrued a mean score of 44.2 (mean score per item = 4.91), indicating that participants were more strongly engaged in work activities. In terms of mental health according to the DASS-21, a mean score of 18.7 (mean score per item = 0.89), indicates at least mild distress for some participants. On the physical health index as assessed by the SF-36, the mean was 74.3 (mean score per item = 2.06) implying nurses from this study cohort perceived themselves as generally having good physical health.

Table 3 shows the results of the confirmatory factor analysis (CFA) that validates the constructs being measured. Each factor loading exceeds 0.70, indicating a strong relationship between the observed variables and their respective latent constructs. The significant p-values (all less than 0.001) for the job crafting, work engagement, mental health, and physical health variables indicate the reliability of the measurement model. This table supports the robustness of the theoretical framework and justifies further analysis.

As indicated in Table 4, a correlation was found between job crafting, work engagement, mental health,

Ibrahim *et al. BMC Nursing*   (2025) 24:404

Page 7 of 11

Table 4 Correlation analysis

Variable	Job crafting	Work engagement	Mental health	Physical health
Job crafting	1			
Work engagement	0.62	1		
Mental health	-0.56	-0.45	1	
Physical health	0.52	0.40	0.45	1

Table 5 Structural equation modelling results

Path	Estimate	Standard error	z-value	p-value
Job crafting → mental health	-0.45	0.12	-3.75	<0.001
Job crafting → physical health	0.40	0.10	4.00	<0.001
Job crafting → work engagement	0.30	0.08	3.75	<0.001
Work engagement → mental health	-0.25	0.10	-2.50	<0.01
Work engagement → physical health	0.20	0.09	2.22	<0.05

and physical health. A significant positive correlation was found between job crafting and work engagement ($r = 0.62$), indicating that greater job crafting behaviours relate to higher levels of work engagement. A significant negative correlation was found between job crafting and mental health ($r = -0.56$), indicating that job crafting behaviours are linked to less mental health distress. Job crafting is also positively correlated with physical health ($r = 0.52$), showing that the more a person crafts their job, the better their physical health.
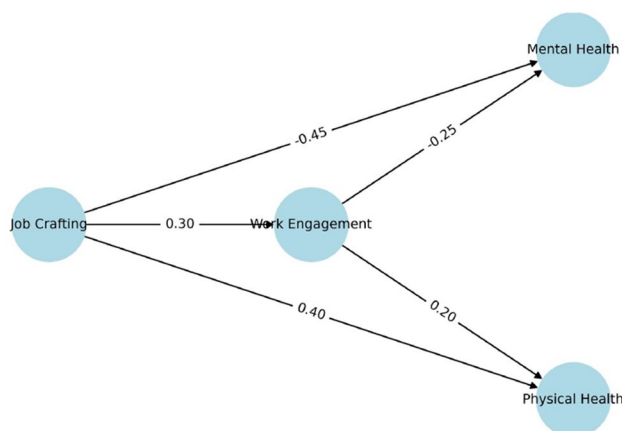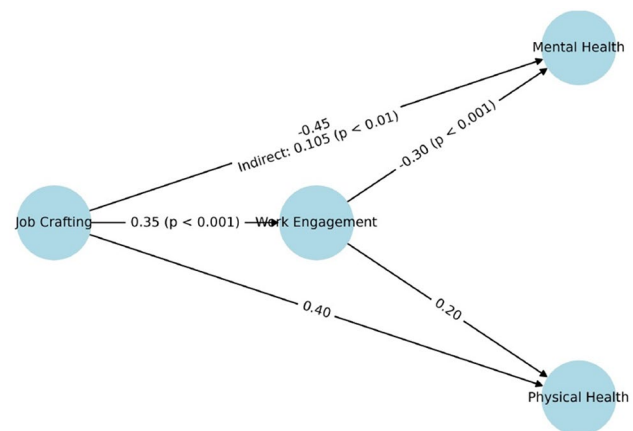

Table 5 provides a clear explanation of the results of structural equation modelling (SEM), which elucidates job crafting, work engagement, and health outcomes. In the analysis of job crafting being the independent variable with work engagement as a mediating variable, while mental health and physical health are the dependent

Table 6 Mediation analysis results

Mediator	Path (Job crafting → mediator)	Path (Mediator → health outcome)	Indirect effect (*p*-value)
Work engagement	0.35 ($p < 0.001$)	-0.30 ($p < 0.001$)	0.105 ($p < 0.01$)

variables, the information on job crafting came from the total score from the Job Crafting Scale (JCS), which captures a global measure of overall job crafting behaviours across its four dimensions (increasing structural job resources, increasing social job resources, increasing challenging job demands, and decreasing hindering job demands). This is designed to develop complete bearings about the grand impact of job crafting on health, and work outcomes, future studies might expose the value and relevance of dimension-wise analyses keeping in mind differential impacts. The findings indicate that job crafting hurts mental health ($\beta = -0.45$) and a positive impact on physical health ($\beta = 0.40$). Job crafting also has a positive effect on work engagement ($\beta = 0.30$) which, in turn, hurts mental health ($\beta = -0.25$) and a positive effect on physical health ($\beta = 0.20$). All paths were found significant ($p < 0.05$) which indicates the significance of job crafting and work engagement in establishing better health outcomes.

The mediation analysis results are provided in Table 6, which show significant indirect effects through work engagement. Work engagement positively mediates between job crafting and the mental health variable (0.35, $p < 0.001$), while work engagement negatively mediates between job crafting and mental health (-0.30, $p < 0.001$). The significant indirect effect of 0.105 ($p < 0.01$) demonstrates that work engagement is very important in the relationship between job crafting and health outcomes.

Ibrahim *et al. BMC Nursing*   (2025) 24:404

Page 8 of 11

Discussion

Nurses specializing in palliative care need to take care of their health and well-being, as this is crucial not just for their well-being but also for the quality of care provided to patients with serious illnesses. Since the work of palliative nurses is emotionally and physically demanding, it is important to consider the factors that can improve the well-being of these professionals [54, 55]. This research assesses the impact of job crafting and work engagement—conceptualized as a proactive behaviour in which nurses change their job design and tasks to increase their job satisfaction and engagement—on the psychological and physical well-being of nurses working in palliative care. The findings offer important insights into the potential of job crafting as a critical intervention for promoting health outcomes in a vital sector of the nursing workforce.

The demographic data facilitate the comprehension of the sample population. A major portion of the respondents who were sampled were female nurses. A significant number of the same group had approximately five to ten years' experience in palliative nursing. The aspect of having a large number of respondents being female nurses is understandable due to the nature of the nursing profession. The demographic data are also relevant since they mirror the experiences and challenges that affect most members of the nursing workforce. This is especially evident in palliative care, an area where emotional resilience is of paramount importance. A considerable number of research studies confirm that most of the nursing staff in the world are women. This fact creates the need for the gender-oriented research in the nursing field. Moreover, the research findings prove that the gender dynamics can affect the job satisfaction and the ways in which the nurses address the stress [56–58].

The analysis of key variables shows that the scores for job crafting, work engagement, mental health, and physical health fall within a particular range. The study therefore establishes that the nurses engaged in job crafting at a moderate level and that this is the reason for their mental and physical health. The study also found that the nurses had high levels of work engagement, another cause of their health. The study established a moderate level of job crafting among the nurses which is an indicator that, even though the nurses are using strategies to make their work interesting, they have not employed these strategies to their best. This is why there is a need for organizational support in the nursing field. The results of the current study concur with several other researches that have established that job crafting has a significant impact on the engagement of nurses and other employees [31, 59–62].

The structural equation modelling and correlation analysis results highlight the relationships between job crafting, work engagement, and nursing health outcomes. Job crafting is positively associated with work engagement ($r=0.62$) and physical health ($r=0.52$), but it negatively correlates with mental health distress ($r = -0.56$). The direct effects further indicate that job crafting has a positive direct effect on the physical health of a person ($\beta = 0.40$) and a negative direct effect on the mental health of a person ($\beta = -0.45$). From the results, job crafting is good for improving job engagement and the physical well-being of a person. However, the same does not apply to mental health, and people may end up having emotional burdens, especially in high-stress environments such as the healthcare system.

These findings are supported by earlier research. Because it gives one more autonomy and control over their workplace, job crafting—which entails proactively changing work duties and interactions—has been associated with both enhanced physical health and higher job satisfaction [49]. However, the emotional toll of taking on more professional tasks may be reflected in its detrimental effects on mental health, which could result in stress or burnout [45]. According to studies, creating more demanding job requirements through job designing could lead to pressure to perform to greater standards, which could exacerbate emotional tiredness [63]. Furthermore, Saad and Ahmed [64], noted that job designing must be used with balance because it can result in unintentional psychological strain in high-stress professions like nursing.

Hence, job crafting promotion is a matter of a strategic approach. In general, it is possible to state that encouraging job crafting can improve job satisfaction, resilience, and retention and reduce job burnout. Healthcare organizations should provide a structured approach to job crafting. To regulate this process, it is necessary to develop interventions for job crafting that can provide nurses with the required emotional and psychological support. In this case, nurses will have an opportunity to benefit from autonomy without these factors being the source of stress. previous Research findings indicate the importance of promoting the strategy of integrating job crafting within the programs of professional development to manage the workforce more effectively and to focus on the quality of patient care [44, 45, 63].

The mediation analysis provides insights into the intermediary role of work engagement in the correlation between job crafting and the health outcomes of the nurses. The mediator work engagement was found to be a significant mediator in the relationship between job crafting and the health outcomes of the nurses. The job crafting practices of the nurses seem to increase their work engagement, influencing their mental health and physical health. The identification of the mediator work engagement marks the necessity of an engaged nursing

workforce. The healthcare organizations can support job crafting behaviours to promote the engagement of the workers, especially the nurses, to improve the health outcomes. The previous research studies demonstrated that work engagement is the mediator that relates the job resources and the health outcomes. Therefore, the research studies conducted on the mediator work engagement in the nursing sector provide the base to understand the mediator in this study [46, 63–69].

Study limitations

The study has several limitations. First, the cross-sectional design does not allow establishing the causality between job crafting, work engagement, and health outcomes. The relationships should be examined in the longitudinal or experimental studies. Second, the study was conducted with the self-reported measures, which may lead to the response and social desirability biases. To avoid these issues, the future research could use the objective health indicators or supervisor evaluations. Third, the sample was drawn from the single oncology department in Egypt, which limits the generalizability of the findings to other healthcare settings or cultural contexts. Fourth, the mediation analysis helps to reveal the role of work engagement in the relationship between job crafting and health outcomes. However, the potential mediators, such as organizational support or resilience, were not examined in the study and should be the subject of the further investigations.

Conclusion

The findings of this study demonstrate a notable correlation between job crafting and the mental and physical health outcomes of palliative care nurses, thereby substantiating the advantageous impact of job crafting in promoting positive health outcomes. In particular, an increase in job crafting behaviours, including task, relational, and cognitive modifications, is associated with enhanced physical health and improved mental wellbeing among nurses. However, the presence of mediators such as work engagement and perceived stress highlights the complexity of these relationships. This suggests that while job crafting can positively influence health, its impact may vary depending on the nurse's stress levels and engagement. These findings indicate that the active reshaping of work environments by nurses may serve to alleviate stressors and enhance their health and resilience, thereby contributing to a more effective and supportive palliative care environment.

Recommendations

Nursing management can play a pivotal role in facilitating job crafting by cultivating a work culture that fosters flexibility, creativity, and autonomy. The implementation of policies that empower nurses to modify their tasks, relationships, and perceptions of work has the potential to enhance both individual well-being and overall team cohesion. It would be beneficial for managers to consider implementing strategies that promote work engagement and reduce stress levels amongst their employees. Such strategies could include providing access to stress management resources, facilitating professional development opportunities and ensuring a supportive work environment. By prioritising job crafting as a key aspect of job design, nursing leaders can positively impact staff satisfaction, reduce burnout, and ultimately improve the quality of care provided to palliative care patients.

Data availability
No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate
The Declaration of Helsinki's highest ethical standards were followed in this study to protect each participant's rights, privacy, and welfare. Approval was granted by the Faculty of Nursing, Zagazig University, Egypt, with the approval code number (ID/Zu.Nur.REC#:00270). All participants were informed of the study's purpose, procedures, potential risks, and benefits. They were also assured that their participation was voluntary and that they could withdraw at any time without repercussions. The confidentiality of personal data was rigorously maintained, and the data were anonymised to prevent any identifiable information from being linked to individual participants. Prior to the collection of data, informed consent was obtained from each participant, ensuring that they were aware of their rights and the objectives of the study. Furthermore, the study adhered to the ethical guidelines and standards for research involving human subjects as set forth by the university's ethics review board and aligned with international best practices in health research ethics.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

Author details
¹Nursing Administration and Education Department, College of Nursing, Prince Sattam bin Abdulaziz University, Al-Kharj 11942, Saudi Arabia
²Family and Community Health Nursing Department, Faculty of Nursing, Port Said University, Port Said, Egypt
³Maternity and Child Health Nursing Department, College of Nursing, Prince Sattam bin Abdulaziz University, Al-Kharj, Saudi Arabia
⁴Pediatric Nursing Department, Faculty of Nursing, Port Said University, Port Said, Egypt
⁵Nursing Administration Department, Faculty of Nursing, Port Said University, Port Said, Egypt
⁶Gerontological Nursing Department, Faculty of Nursing, Zagazig University, Zagazig, Egypt
⁷Department of Medical and Surgical, College of Nursing, Qassim University, Buraydah, Qassim, Saudi Arabia
⁸Present address: Public health nursing Department, Nursing College, Northern Border University, Arar, Saudi Arabia
⁹Maternal and Child Health Nursing Department, College of Nursing, Northern Border University, Arar, Saudi Arabia

References
1. Moran S, Bailey ME, Doody O. (2024). Role and contribution of the nurse in caring for patients with palliative care needs: A scoping review. PLoS ONE, 19(8), e0307188.
2. Carelli KF. Meeting the Emotional Needs of Hospice Patients: A Mixed-Methods Study (Doctoral dissertation, University of Massachusetts Boston). 2024.
3. Costeira C, Querido A, Ventura F, Loureiro H, Coelho J, Benito E, Laranjeira C. May). Spiritual care [Givers] competence [givers]n palliative care: A scoping review. Healthcare. Volume 12. MDPI; 2024. p. 1059. 11.
4. Reid BB, Brogan P. Nurses' experiences of providing palliative care for children with life-limiting conditions. Int J Palliat Nurs. 2024;30(5):212–24.
5. Cue MFF, Mateo M, Razo MAG. Communication between nurses and relatives of patients in the End-of-Life care. A Descriptive Literature Review; 2024.
6. Yu J, Soh KL, He L, Wang P, Soh KG, Cao Y. The experiences and needs of hospice care nurses facing burnout: A scoping review. Am J Hospice Palliat Medicine®. 2023;40(9):1029–39.
7. Basile I, Consolo L, Rusconi D, Arba L, Rampichini F, Caraceni A, Lusignani M. The perspective of cancer patients in palliative care on unmet needs: A qualitative synthesis using meta-Ethnography. Am J Hospice Palliat Medicine®. 2024;41(12):1491–505.
8. Alwali J. (November). How high-involvement work practices, leadership and job crafting influence nurses' innovative work behavior. Evidence-based HRM: a global forum for empirical scholarship. Emerald Publishing Limited. 2023;11(4):709–24.
9. Zhang X, Zhang C, Gou J, Lee SY. The influence of psychosocial work environment, personal perceived health and job crafting on nurses' well-being: a cross-sectional survey study. BMC Nurs. 2024;23(1):373.
10. Alkhraishi MY, Yesiltas M. The impact of job crafting dimensions on work engagement among nurses: the mediating role of psychological capital. Asia Pac J Health Manage. 2024;19(2).
11. Wang Y, Yang Q, Wang L, Zhang Q, Li Y. The factors of job crafting in emergency nurses: regression models versus qualitative comparative analysis. BMC Nurs. 2024;23(1):369.
12. Felder M, Kuijper S, Allen D, Bal R, Wallenburg I, RN2Blend consortium. Job crafting as retention strategy: an ethnographic account of the challenges faced in crafting new nursing roles in care practice. Int J Health Plann Manag. 2024;39(3):722–39.
13. Liu T, Wang W, Shan G, Zhang Y, Liu J, Li Y. Job crafting and nurses' presenteeism: the effects of job embeddedness and job irreplaceability. Front Public Health. 2022;10:930083.
14. Ageiz MH, Abd E, Mageed HH. Job crafting intervention program: a means for promoting interprofessional learning and performance adaptability among nurses. Menoufia Nurs J. 2023;8(4):291–319.
15. Sheehan C, Tham TL, Holland P, Cooper BK, Newman A. The relationship between HIWPs and nurse work engagement: the role of job crafting and supervisor support. Int J Hum Resource Manage. 2023;34(1):1–27.
16. Waddill-Goad S. Beyond burnout: overcoming stress in nursing & healthcare for optimal health & Well-being. Sigma Theta Tau. 2023.
17. Levett-Jones T, Catling C, Cheer S, Fields L, Foster A, Maguire J, Lokmic-Tomkins Z. (2024). Achieving consensus on the essential knowledge and skills needed by nursing students to promote planetary health and sustainable healthcare: A Delphi study. J Adv Nurs.
18. Srulovici E, Azriel Y, Golfenshtein N, Drach-Zahavy A. Job crafting strategies of nurse mentors as mentors and nurses and their impact on missed nursing care: A cross-sectional study. Nurse Educ Today. 2023;127:105844.
19. Guo YF, Wang SJ, Plummer V, Du Y, Song TP, Wang N. Effects of job crafting and leisure crafting on nurses' burnout: A machine Learning-Based prediction analysis. J Nurs Adm Manag. 2024;2024(1):9428519.
20. Harbridge R, Ivanitskaya L, Spreitzer G, Boscart V. Job crafting in registered nurses working in public health: A qualitative study. Appl Nurs Res. 2022;64:151556.
21. Topa G, Aranda-Carmena M. Job crafting in nursing: mediation between work engagement and job performance in a multisample study. Int J Environ Res Public Health. 2022;19(19):12711.
22. Han S. Nurses' job crafting, work engagement, and well-being: a path analysis. BMC Nurs. 2023;22(1):405.
23. Golfenshtein N, Azriel Y, Drach-Zahavy A, Srulovici E. Exploring nurse mentors' job crafting: A longitudinal study on missed nursing care across student supervision. Nurse Educ Pract. 2024;80:104143.
24. Abou Shaheen R, Aly Mahmoud S. Relation between job crafting, nurses' job satisfaction and counterproductive work behaviors. Egypt J Health Care. 2021;12(3):1497–515.
25. Rafiq M, Farrukh M, Attiq S, Shahzad F, Khan I. Linking job crafting, innovation performance, and career satisfaction: the mediating role of work engagement. Work. 2023;75(3):877–86.
26. Peerman CH. The relationship between leadership styles, job satisfaction, and tenure among nursing home administrators. J Health Adm Educ. 2023;39(2):237–52.
27. Papworth A, Ziegler L, Beresford B, Mukherjee S, Fraser L, Fisher V, Taylor J. Psychological well-being of hospice staff: systematic review. BMJ Supportive Palliat Care. 2023;13(e3):e597–611.
28. Zahoor A, Khan D, Fazili SB. Cultivating Well-being of nurses through job crafting: the moderating effect of job and personal resources. J Health Manage. 2023;09720634231216024.
29. Baig LD, Azeem MF, Paracha A. Cultivating innovative work behavior of nurses through diversity climate: the mediating role of job crafting. SAGE Open Nurs. 2022;8:23779608221095432.
30. Parkinson-Zarb L. I acknowledge that copyright of any published works contained within this thesis resides with the copyright holder (s) of those works. I give permission for the digital version of my research submission to be made available on the web, via the University's digital research repository, unless permission has been granted by the University to restrict access for a period of time (Doctoral dissertation, RMIT University). 2022.
31. Jutengren G, Jaldestad E, Dellve L, Eriksson A. The potential importance of social capital and job crafting for work engagement and job satisfaction among health-care employees. Int J Environ Res Public Health. 2020;17(12):4272.
32. Kohnen D, De Witte H, Schaufeli WB, Dello S, Bruyneel L, Sermeus W. What makes nurses flourish at work? How the perceived clinical work environment relates to nurse motivation and well-being: A cross-sectional study. Int J Nurs Stud. 2023;148:104567.
33. Demerouti E, Peeters MC, van den Heuvel M. Job crafting interventions: do they work and why? Posit Psychol Intervention Des Protocols multi-cultural Contexts. 2019;103:125.
34. Abuzaid AN, Ghadi MY, Madadha SAM, Alateeq MM. The effect of ethical leadership on innovative work behaviors: A mediating–moderating model of psychological empowerment, job crafting, proactive personality, and person–organization fit. Administrative Sci. 2024;14(9):191.
35. Chen H, Kewou NYN, Atingabili S, Sogbo ADZ, Tcheudjeu AT. The impact of psychological capital on nurses' job performance: a chain mediation analysis of problem-focused coping and job engagement. BMC Nurs. 2024;23(1):149.
36. Saleh MSM, Abd-Elhamid ZN, Aldhafeeri A, Dailah NG, Alenezi H, Zoromba A, M., Elsaid Elsabahy H. Appreciative leadership, workplace belongingness, and affective commitment of nurses: the mediating role of job crafting. J Nurs Adm Manag. 2024;2024(1):2311882.
37. Song Y, Wang Z, Song LJ. Going the extra mile for patients: Service-oriented high-performance work systems drive nurses' job crafting and extra-role service behaviour. J Adv Nurs. 2024.

38. Frangeskou M, Erthal A, Ndibalema R. Managing the tensions of standardized work processes in healthcare operations: the job crafting lens. J Bus Res. 2024;173:114459.

39. Powell Jr T. The relationship between burnout, organizational commitment, and employee engagement with nurse turnover intentions (Doctoral dissertation, Grand Canyon University). 2024.

40. Ding B, Cao C. An examination of interaction between transformational leadership and hindrance and challenge stressors for nurses. Curr Psychol. 2024;43(19):17701–13.

41. Bakker AB, Demerouti E. Job demands–resources theory: frequently asked questions. J Occup Health Psychol. 2024;29(3):188.

42. Bartzik M, Bentrup A, Hill S, Bley M, von Hirschhausen E, Krause G, Peifer C. Care for joy: evaluation of a humor intervention and its effects on stress, flow experience, work enjoyment, and meaningfulness of work. Front Public Health. 2021;9:667821.

43. Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB. The job demands-resources model of burnout. J Appl Psychol. 2001;86(3):499.

44. Bakker AB, Demerouti E. The job demands-resources model: state of the Art. J Managerial Psychol. 2007;22(3):309–28.

45. Bakker AB, Demerouti E. Job demands–resources theory: taking stock and looking forward. J Occup Health Psychol. 2017;22(3):273.

46. Wrzesniewski A, Dutton JE. Crafting a job: revisioning employees as active crafters of their work. Acad Manage Rev. 2001;26(2):179–201.

47. Schaufeli WB, Salanova M, González-Romá V, Bakker AB. The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. J Happiness Stud. 2002;3:71–92.

48. Bakker AB, Demerouti E. Towards a model of work engagement. Career Dev Int. 2008;13(3):209–23.

49. Tims M, Bakker AB, Derks D. Development and validation of the job crafting scale. J Vocat Behav. 2012;80(1):173–86.

50. Schaufeli WB, Bakker AB, Salanova M. The measurement of work engagement with a short questionnaire: A cross-national study. Educ Psychol Meas. 2006;66(4):701–16.

51. Keyko K, Cummings GG, Yonge O, Wong CA. Work engagement in professional nursing practice: A systematic review. Int J Nurs Stud. 2016;61:142–64.

52. Lovibond SH. Manual for the depression anxiety stress scales. Sydney psychology foundation. 1995.

53. Ware JE Jr, Sherbourne CD. The MOS 36-Item short-form health survey (SF-36): I. Conceptual framework and item selection. Med Care. 1992;30(6):473–83.

54. Agunwah EU, Nworie A, Eze CU. Effect of supportive palliative care educational intervention on nurses' knowledge and attitude towards palliative care in selected tertiary hospitals in South East Nigeria. Med Public Health Res J. 2024;10843728:14–31. https://doi.org/10.5281/zenodo.

55. Ibrahim AM, Wahba NMI, Zaghamir DEF, Mersal NA, Mersal FA, Ali RAES, Mohamed HAH. Impact of a comprehensive rehabilitation palliative care program on the quality of life of patients with terminal cancer and their informal caregivers: a quasi-experimental study. BMC Nurs. 2024;23(1):357.

56. Global Health 50/50. The global Health 50/50 report: How gender responsive are the world's leading global health organisations. 2018. https://globalhealth5050.org/wpcontent/uploads/2018/03/GH5050-Report-2018_Final.pdf

57. World Health Organization. State of the world's nursing 2020: investing in education, jobs and leadership. 2020. Retrieved from Geneva: https://www.who.int/publications/i/item/97892

58. Woo BFY, Goh YS, Zhou W. Understanding the gender gap in advanced practice nursing: A qualitative study. J Nurs Adm Manag. 2022;30(8):4480–90.

59. Baghdadi NA, Abd F, S. M., Alsayed SK. The relationship between nurses' job crafting behaviours and their work engagement. J Nurs Adm Manag. 2021;29(2):214–9.

60. Pan J, Chiu CY, Wu KS. Leader-member exchange fosters nurses' job and life satisfaction: the mediating effect of job crafting. PLoS ONE. 2021;16(4):e0250789.

61. Yun MS, Lee M, Choi EH. Job crafting, positive psychological capital, and social support as predictors of job embeddedness on among clinical nurses- a structural model design. BMC Nurs. 2024;23(1):192.

62. Mohamed Ahmed Mohamed F, Hassan A, H., El-hamid AA, L. Relation between job crafting, staff nurses' job satisfaction and counterproductive work behaviors. Egypt J Health Care. 2024;15(4):486–96.

63. Elsayed R. Nurses' job crafting and its' relationship with their job demands, job resources, and career competencies. Int J Novel Res Healthcar Nurs. 2019;6(2):1459–74.

64. Saad ES, Ahmed FM. Emotional stability of nurses and its relation to their job crafting. Evidence-Based Nurs Res. 2020;2(1):10–10.

65. Confirm the structural. validity of the constructs related to job crafting and health outcomes in nursing.

66. Bindl UK, Unsworth KL, Gibson CB, Stride CB. Job crafting revisited: implications of an extended framework for active changes at work. J Appl Psychol. 2019;104(5):605.

67. Zhang F, Parker SK. Reorienting job crafting research: A hierarchical structure of job crafting concepts and integrative review. J Organizational Behav. 2019;40(2):126–46.

68. Gordon HJ, Demerouti E, Le Blanc PM, Bakker AB, Bipp T, Verhagen MA. Individual job redesign: job crafting interventions in healthcare. J Vocat Behav. 2018;104:98–114.

69. Bakker AB, Demerouti E, Sanz-Vergel AI. Burnout and work engagement: the JD–R approach. Annu Rev Organ Psychol Organ Behav. 2014;1(1):389–411.

Publisher's note