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Nurses' viewpoint of sustaining work despite musculoskeletal pain: A qualitative study

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Abstract:

BACKGROUND: The nursing profession consistently has the highest rates of musculoskeletal disorders (MSDs) among occupations due to physical and psychological pressures, leading to an increased number of sickness absences, early retirement, staff shortage, poor health conditions, and need for medical care. Absence among healthcare workers puts the quality of patient care at risk, and increase colleagues' workload and employer staffing expenses. This study aimed to investigate the viewpoints of Iranian nurses about sustaining work despite musculoskeletal pain.

MATERIALS AND METHODS: This study was performed as qualitative research. Data were gathered using purposive sampling through in-depth one-to-one interviews with 21 nurses. Interviews were audio-recorded, transcribed verbatim, and imported into the computer software MAXQDA 2020. Graneheim and Lundman's conventional content analysis was performed to analyze the data, and Lincoln and Guba's recommendations were used to control the trustworthiness of the data.

RESULTS: A total of 4 main categories and 15 subcategories emerged after several rounds of analyzing and summarizing the data and considering the similarities and differences. These main categories included education, workplace adjustments, supportive culture, and regulations and legislations.

CONCLUSION: Considering the attitudes of nurses with MSDs on continuing work is important for developing and implementing interventions to facilitate the work for this vulnerable working profession and to promote compliance with these measures. Quantitative studies on the effectiveness of the proposed strategies are required for more scientific evidence.

Keywords:

Musculoskeletal diseases, nurses, return to work, sick leave

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Introduction

The nursing profession consistently has the highest rates of musculoskeletal disorders (MSDs) among occupations.[1,2] Physical and psychological pressures are regarded as being inherent to the practice of nursing, making it a demanding job.[3,4] According to the US Bureau of Labor Statistics in 2011, musculoskeletal conditions accounted for almost 50% of nursing staff injuries and illnesses. Compared to other professions, nursing assistants received the highest ranking for having these problems, and registered nurses ranked fifth.[1,2]

According to recent reviews, the annual prevalence of work-related musculoskeletal disorders (WMSDs) was reported to be 77.2% among nurses. The lower back, neck, and shoulder were the three anatomical regions with the highest prevalence of WMSDs among nurses (59.5%, 53.0%, and 46.8%, respectively).[5] Findings of a systematic review conducted by Bayan Saberipour *et al.* showed that the prevalence of MSDs and low back pain were 84% and 60% among Iranian nurses, respectively.[6]

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WMSDs, mostly appear as strain and sprain injuries, are known as a common occupational health issue among all healthcare staff and the leading cause of disability worldwide.[6-10] They result in pain, discomfort, impairment, and disability in body structures appearing after some days or longer time of exposure to risk factors.[6,7,11,12] Major consequences of WMSDs in nursing staff are increased number of sickness absences, early retirement, staff shortage, poor health condition, and need for medical care.[11,13,14]

Sickness absence imposes heavy pressure on the government, employees, employers, and public resources in terms of public health.[15] This is brought on by decreased productivity, a heavier workload for other employees, as well as resources used to compensate for lost wages and recover from illness. Absences among healthcare workers put the quality of patient treatment at risk, and increase colleague workload, and employer staffing expenses.[16] Long-term sickness absence can cause harm to the person's wellbeing and delay the RTW, whereas work help to recovery.[10,17]

Considering the consequences of absenteeism due to MSDs for the health, production, and economy of society and nurses, it is important to investigate the factors that influenced remaining at work from the perspective of nurses with these disorders. Qualitative research has produced progress in our understanding in areas like the experiences of living with pain, obstacles of evidence-based pain control, and pain education across the life period of populations. This is obtained through the examination of personal explanations, organizational procedures, and lived experiences. In comparison to quantitative methods, fewer qualitative researches have been conducted in the field of pain despite their power and contributions to the study of pain.[18]

Qualitative research on the experiences of nursing staff of MSDs and managing pain,[18-21] WMSD prevention practices,[14,22] and concerns about continuing work in workers with musculoskeletal pain[23-25] were conducted previously. Despite those studies, knowledge of the attitude of nurses with WMSDs about sustaining work despite pain is limited. Health policymakers, hospital, and occupational health managers can consider this information in addressing the needs of this vulnerable working profession, improving their health and safety, and developing and implementing the interventions and laws to increase the likelihood of staying at work despite the pain or returning to work. Hence, we aimed to investigate the viewpoints of Iranian nurses, with contextual and cultural differences compared to other professions and countries on staying at work despite MSD-related pain.

Materials and Methods

Study design and setting

The present study was a conventional qualitative content analysis which conducted at Kerman University of Medical Sciences in 2022. Content analysis helps to infer or draw conclusions from qualitative or quantitative data. This approach is useful when there is not much existing theory or study on a given subject.[26]

Study participants and sampling

This qualitative study was performed on 21 nurses who worked in different parts of university hospitals. Participants were chosen through purposeful sampling. Two male nurses and 19 female nurses were interviewed. The inclusion criteria included the nurses with a bachelor or higher degree in the nursing field with musculoskeletal pain in different parts of the body, and willingness to participate in the study. The exclusion criterion was the lack of consent to participate in the study. Sampling proceeded up to data saturation, which means additional interviews would not produce new information. The purpose and scope of the study were described to all participants before the interview, and written consent was received.

Data collection tool and technique

In-depth, semistructured interviews through open-ended questions were used to conduct this qualitative study. To test the relevance of the interview guide, two pilot interviews were conducted. Changes were made and the two interviews were not included in the analysis. The interview guide contained the following questions: 1. What factors caused and aggravated musculoskeletal pain in you? 2. How do musculoskeletal problems affect your daily life and work? 3. What measures have been taken by yourself and at your workplace to prevent sick leave and keep you at work despite these disorders? 4. In your opinion, what measures can help prevent sick leave, and encourage staying at work despite these disorders? 5. What organizations and people can help in preventing work absences and in continuing to work despite these disorders? 6. What are your motivations to continue working despite musculoskeletal problems? Aspects were probed in more depth according to the informants' reflections about staying at work despite WMSDs. The interviews were audio-recorded and transcribed verbatim and lasted between 13 and 42 min. Field notes were also taken during the interviews to precisely document and examine the responses.

Data analysis

The content analysis method developed by Graneheim and Lundman[27] was applied to the data gathered in this step. The MAXQDA software version 2020 was utilized to manage the coding process. Twenty-one

interviews were entered into the MAXQDA software. The unit of analysis in this study was transcribed interviews. The researchers read the transcribed texts several times to make sure they properly understood the scripts through the inductive approach. The meaning units (words, sentences, or paragraphs) that addressed the nurses' perspectives on sustaining work despite WMSDs were then recognized, condensed, and coded. Comparable codes with related ideas and content were grouped into subcategories which were then combined to make a category (manifest content). Each category developed from a group of associated concepts, making them internally homogeneous although externally heterogeneous. The interaction of the underlying meanings in categories emerges as the key concept (latent content).

Trustworthiness

This study used Lincoln and Guba's recommendations [28] for reliability and validity tests. According to these suggestions, creditability, dependency, conformability, and transferability are required to ensure reliability. The researchers interacted with the data and the environment for one year, constantly making observations and providing field notes in an effort to increase the data's reliability. Peer check processes were conducted to confirm the data's dependability. These meetings were established monthly to ensure that the study researchers had discussed the data recently extracted. The interest of the study team in the related issues, base knowledge, and the investigation of the documents was used to appraise data conformability. The interview context, identified codes, and categories were analyzed by the study team like other specialists in qualitative research. Maximum variation sampling enabled the researchers to acquire a wide range of different comments, observations, and explanations.

Results

Participants demographic data

Nineteen female and two male nurses from various hospital departments were interviewed to explore their attitudes about continuing to work while experiencing musculoskeletal pain. Almost all the participants experienced musculoskeletal pain in multiple body regions from one month to even 20 years in the past. The mean of working time was 45/6 hours per week, although the younger nurses reported more hours of working in a week. Three participants reported that they changed their ward because of MSDs, and one of them transferred to another hospital [Table 1].

Table 1 : Demographic information of participants

Demographic characteristic	Subcategory	Number (percentage of the samples)
Gender	Male	2 (9.5%)
	female	19 (90.5%)
Age (year)	25–35	3 (14.3%)
	36–45	12 (57.1%)
	≥46	6 (28.6%)
Work experience	≤10	2 (9.5%)
	11–20	13 (61.9%)
	21–30	6 (28.6%)

Main results

Analysis of the data from interviews led to the emergence of 97 primary codes which 41 primary codes related to contributing factors of WMSDs occurrence and consequences, and 56 primary codes were related to recommended solutions for sustaining work despite having these problems according to the participants' experiences in nursing. Giving priority to the patients' health and needs rather than considering themselves, high work pressure alongside the home responsibilities, inadequate and not active training on MSDs prevention, management and safety principles at university and workplace, incompatibility of working conditions with personnel characteristics, writing nursing reports in a situation with not having a standard chair and table, shortage of nurses, dissatisfaction with the imbalance between income and the workload, and between work and life were some expressed contributing factors of the occurrence of WMSDs. Participant nurses expressed some consequences of having these problems including disturbing quality of patient care, being recurrent and cumulative the nature of these problems, having problems in doing many daily life tasks including house chores, and therefore family burden, sleeping problem, expensive healthcare costs such as MRI and CT-scan, required time and waiting list for medical care, and sickness absence.

The analysis of interview data resulted in the exploration of individual, organizational, and intersectoral strategies regarding the principal theme "continue working despite musculoskeletal pain" from the perceptions of nurses in the context of Iranian university hospitals. The content analysis method produced four primary categories of recommendations after a number of iterations of examining, summarizing, and accounting for similarities and differences in the data. These categories include: 1) education, 2) workplace adjustments, 3) supportive culture, and 4) regulations and legislations. These four main categories were then classified into 15 subcategories extracted from analyzing the field notes and interviews [Figure 1]. Extracted categories and subcategories of strategies are explained in the following parts.

Strategies for sustaining work despite pain

There is substantial evidence that work generally improves both physical and mental health, and it is a

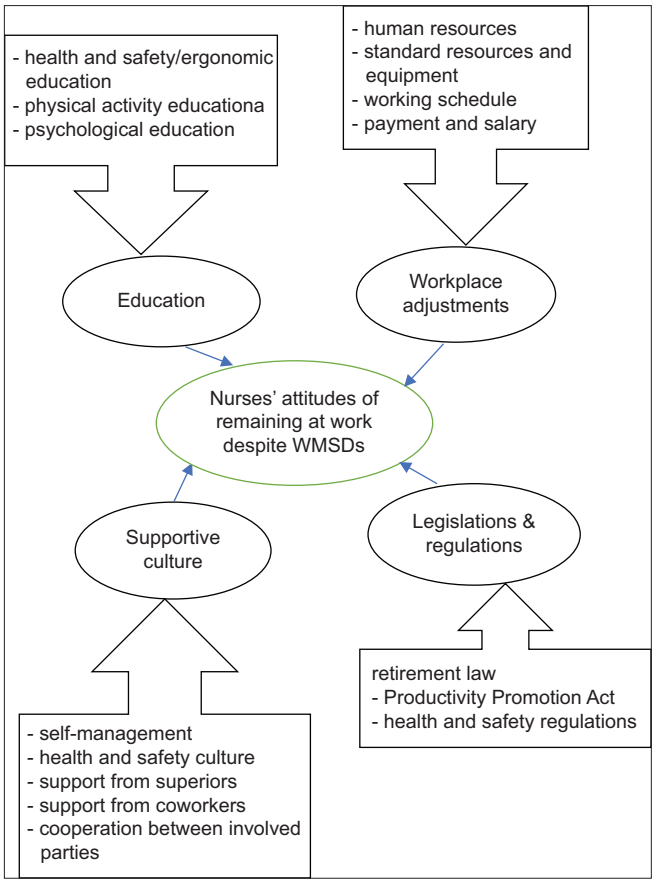

Figure 1: Categories and subcategories associated to sustaining the work from the perspective of nurses with WMSDs

crucial component of a quick recovery from illnesses, and that absence from work has a vast economic cost.[29,30] Therefore, sustaining work is an important issue for the wellbeing and economy of the injured persons, their organization, and society as a whole. Education, workplace adjustments, supportive culture, and legislations and regulations were the effective strategies to continue working despite musculoskeletal pain based on participants' perspectives.

Education

The data from the interviews with the participant nurses revealed that education is the most frequent challenge and also recommendations to manage WMSDs. This category consists of three subcategories ergonomics training, physical exercises training, and psychological training. Participants believed that education leads to recognition of wrong and right ways of performing their tasks and a positive change in their behavior.

- **Occupational health and safety education**

The data in this study indicated that timely training in ergonomics principles can assist nurses in avoiding some risk factors that can lead to the occurrence of musculoskeletal diseases and can improve compliance with workplace health and safety. Most of the interviewees noted that these problems appear over time and are recurrent, and stressed on prevention rather than treatment. Hence, they stated that timely and consistent education of accurate ways of performing nursing practices according to occupational health and safety principles to prevent and manage musculoskeletal and other work-related injuries should be given priority.

Participants noted that they had no official education on the correct methods of performing nursing duties to preserve the musculoskeletal system in their educational curriculum except for some oral points during their internship by some coaches. Most of the participants' nurses were aware of the existence of the occupational health department in their organizations, and stated that trainings are provided by this unit either face-to-face or as a training package in their computer system, and brochures. They expressed that training includes ergonomics principles such as the accurate way of sitting, how to pick up the object from the ground, etc. Most of the participants also stated that education should be dynamic and active, and just being in computer systems does not prove its effectiveness. They stated that trainers should visit the wards regularly, and faults should be mentioned to the personnel and eliminated dynamically, and they should follow these issues. Two participants stated that:

P10: "Education from the university and when entering the workplace. And that the personnel themselves take seriously, and apply what is educated to them. If we know, we will comply. We are less bothered."

P13: "If they train me how to work so that I don't get hurt, for example, how to stand or sit or write a report, put your feet like this, sit like this, during university, or before entering the work, I say that they care about me. Then this becomes the queen of your mind, to be the first priority, to always be healthy."

- **Physical exercise training**

Training physical activity was identified as an important way of preventing and managing musculoskeletal complaints. Several participants proposed that it can be helpful to train in physical exercises actively related to assigned duties by sports experts or hospital physiotherapists to alleviate their pain.

P_7: "hold classes for exercise in the workplace, for example, what stretching exercises should be done by someone who sits a lot, what exercises should be done by someone who walks a lot."

P12: "Even though the hospital has a physiotherapist, he never once came and told you to do these exercises."

- **Psychological education**

Some of the interviewees pointed out that healthcare centers are inherently stressful environments due to some issues including fear of catching communicable diseases, seeing patients and their families in critical conditions, stress caused by work pressure, stress caused by sufficient time to do work, etc. They also pointed to the effect of these stresses on the occurrence of WMSDs. Hence, providing occasional psychological support is essential in these environments. However, some expressed that anger and stress control were educated in their hospital.

P9: "Something should be done for nursing, nurses with stressful personalities should be treated. In my opinion, in the entry of each nurse, they should identify their personality type, plan and consider the department based on that,… an informant person should be, to reduce your stress regularly at work. Of course, there are psychiatric units now, but they are not dynamic. They should inform staff of their problems at the start of working."

P13: "I am working in the ICU and you know that the death rate in the ICU is high, it can happen in any department, but it is extremely high in the ICU. But no one evaluates us, or advises us, or asks, you see this corpse, did it affect you? depression is a normal thing, that means we have to, we are forced to laugh apparently, because they say you have worked in ICU or you are nurses, you must be strong."

Workplace adjustments

Insufficient staffing especially not complying with the standard of number of nurses, not assigning the nurses to hospital units according to their physical and psychological characteristics, not adapting to the physical situation of the workplace and working conditions, and inadequate standard equipment were among the important reported challenges that needed to be modified. This category was more specified in human resources, standard resources and equipment, working schedule, and payment and salary.

- **Human resources**

Work conscience and organizational commitment were often stated among workforce-related motivators for working despite the pain. Most of the participants also stated that they love nursing and love working for patients, although some stated that they continue their work because of financial issues and earning income for livelihood.

Failure to comply with the standard of the number of nurses per patient, lack of human resources, and lack of financial resources were the important issues raised by the interviewees. Almost all the interviewees pointed to the necessity of sufficient nursing force to reduce the workload of nurses. These nurses recommended that nursing managers should allocate more nursing personnel to the more crowded wards. They pointed out that managers should report the existing shortages of healthcare organizations to the relevant department in the Ministry of Health.

P_6: "When there is shortage in nurses, they cover the shifts with the same number of nurses. Morning and evening, morning and night, if the workforce increases, the shifts will be reduced, they will rest and the pressure on the nurses will be reduced."

P11: "Training is good, but you have to modify your infrastructure first. For example, when you have 36 patients in your ward, and three nurses are providing services, even if you have received a thousand trainings, you cannot use it. Standard should be implemented. They ask people to do standard work without complying with the standard themselves. It's like you want to walk through water and not get wet."

- **Standard resources and equipment**

Participants proposed that managers should provide resources scientifically and train the staff how to use these resources. Providing electronic beds, footstool, standard table and chair for writing reports, and the possibility to adjust the height of the serum base and monitors were other simple and affordable suggestions of the participant nurses. Writing nursing reports in situations with not having standard chairs and tables was one of the most common challenges expressed by participant nurses. Some recommended that nursing reports can be prepared electronically to save time, energy, and reduce workload.

P_4: "In some wards, I saw that doing this, for example, this flat desk is not good at all for writing reports. It must be a sloping surface. See how she is sitting and writing a report. She is putting pressure on his back."

P_8: "The patient bed should be standard, but it is not. For example, you go to a private hospital, their beds are all electric. But this is not the case here. Only the ICU has electric beds, and the manual use of these bed levers to make patients sit and sleep causes pressure on the hands and neck."

- **Working schedule**

Reducing the working hours, overtime and knight-shift, transferring to the wards with lower workload, care for more stable patients, giving more off especially after knight work, not giving combined shifts, giving the decision to determine the ward, and working schedule

by the nurses with WMSDs and old nursing personnel were strategies suggested by the majority of participants.

For some participants working in crowded wards with heavy workload and under time pressure for many years was mentioned as an unfair issue that aggravated the condition. Participants recommended that transferring nurses between heavy and light duty wards in their occupational career can be a motivator and also a solution to manage MSDs.

P15: "There are many departments that have more workload than our department, such as burn. In my opinion, they should adopt a policy to change the staff between departments, to rotate them, not to let one nurse to be comfortable until the end of his service and another to endure high work pressure."

- **Payment and salary**

Some participants mentioned that there is no balance between their income and their workload, and they are not satisfied financially. Therefore, considering financial incentives was a suggestion to motivate these nurses to continue working.

P20: "if it is really seen from the ministry, …they should pay attention to the personnel who have worked in a heavy department for several years. They should have some advantages."

Supportive culture

Giving priorities to the health and safety of personnel by managers and appreciating them through talking and relationships with workers were identified as influential factors in motivating the personnel to continue working in spite of MSDs. This category includes self-management culture, health and safety culture, support from superiors, support from coworkers, and cooperation between involved parties.

- **Self-management culture**

Taking responsibility for controlling the person's health status and respecting the safety principles is one of the basic matters of managing WMSDs. Several participant nurses pointed to the lack of cooperation and coordination from superiors and managers in the management of MSDs. They noted that they manage their pain by referring to medical professionals, applying their advice, performing suggested exercises by the medical team, providing suitable nursing shoes, or taking pain killers to be able to continue working. Some of the participants stated that doing exercises, specifically those suggested by physiotherapists, were effective in alleviating their pain and also agreed that 10–15 min of stretching and strengthening exercises in rest time in workplace could manage their pain and improve their quality of work. They also recommended that personnel should pay attention to their health and consider occupational health and safety principles when working. Two participants said:

P_3: "Sometimes I feel so pressured, I go, and do a series of sports slowly, between my work."

P16: "I followed the exercises suggested by the physiotherapist, and the yoga exercises that I had been doing for years, so I got relatively good results. At least there is no pain during my work, considering the things I do myself."

Health and safety culture

Occupational safety and health culture and also the culture of supporting personnel to communicate their problems with superiors to find possible solutions or follow up were other extracted issues from the participants' perspective. They noted that management should have a commitment to the health and wellbeing of their personnel and spread this culture among the employees to pay attention to their health first so that they can restore health to the patients. Most of the interviewees stated that if their supervisors and managers pay attention to their staff's health and wellbeing, and if they ask about their conditions even when they are on sick leave, it could elevate their spirit and motivate them for early recovery and work resumption. They also suggested that if the culture of doing sport was established among people, this could have a major effect on the prevention and treatment of musculoskeletal problems and also their negative consequences. They noted that since everyone gets involved in these problems sooner or later, providing the possibility of using several sports clubs and swimming pools in the city for the convenience of personnel access would be beneficial. As two participants stated:

P_5: "It might be better if the information is given first and that they make it stricter for the personnel to comply. Because we don't think, until something bad happens to us."

P9: "I think the basic training should be correct, for example, in schools, high schools and universities, they should learn that, for example, every person should exercise each day for a time in any condition. However, you cannot do this in working conditions, because we are required to look after the patients, and not all wards are the same that they can use."

- **Support from superiors**

The data in this study revealed that support for communication regarding employees' health condition requires promoted organizational culture and

superiors' attitudes. Being recognized and appreciated, attention, to being believed by the managers and free communication are values that are important for employees. Support from straight managers and superiors was one of the significant issues leading to elevated motivation to work. Trust and cooperation between coworkers, supervisors, and managers are necessary for managing sickness and sustaining work for injured workers. Several participant nurses stated that some supervisors and managers did not believe the sickness and, therefore, the sick leave, since there is no trust, although they stated this might be true since one familiar physician can prescribe sick leave.

The majority of participants agreed that short-term sick leave and periodic off can lead to pain alleviating, recovery, and energizing to be refreshed to continue working. Some participants pointed to the cooperation of supervisors in taking sick leave; however, others complained that their superiors do not accept it, because of nurses' shortage and high workload. Some also stated that they did not want to take sick leave because it leads to extra pressure on coworkers, and some pointed to the long process of confirming long-term sick leave, or decreased benefits. Participants also stated that managers should consider that their staff have a private life and pay attention to creating balance between staff's work and private life. Two participants said:

P16: "If it was planned, give us a time to relax for ten minutes. Look, if I want to go, I am free, no one will stop me for these ten minutes, and my patients are naturally supported by my colleagues. When you see that you are being supported by them (supervisors), psychologically makes a person infinitely happy. You are considered in the system, you are not used as a labor force only, and this increases efficiency. We really need support. We need to be heard, to be seen, unfortunately, especially in the wards, like ICU, that are limited and maybe only patients can see what we are doing…."

P13: "I don't see anyone follow our health at all. We have to care ourselves. We have to bring them a verifiable proof that we have a problem. That it's possible that they don't believe…"

- **Support from coworkers**

Most of the participants pointed to the importance of cooperation between colleagues. They stated that if their colleagues know their problem, they will help in the form of covering their shift to take sick leave or taking care of more severe patients.

P18: "if I have a problem, the shifts will be covered by colleagues, but at what cost, the shifts of other colleagues will be much more."

- **Cooperation between involved parties**

Most of the participants agreed that cooperation between clinical specialists, physiotherapists, and supervisors is essential to manage musculoskeletal complaints and to continue working. Participants complained that there is not a coordinated system to treat and manage these problems and their consequences. They stated that their organization provides some periodic medical assessment and education through the occupational health department without active follow-up. They added that it could facilitate the recovery process to assign a person to coordinate treatment and follow-up of persons with these injuries. The majority of participant nurses stressed that since their hospitals have facilities like occupational medicine, psychology, and physiotherapy, it could be helpful for the management of these problems to coordinate the use of these services to save time and costs. Accordingly, two participants said:

P_{7}: "The hospital system itself can help nurses recover and return to work faster. The occupational medicine specialist of the hospital can refer to the hospital's own physiotherapy. This depends on your free time. It is very important that the system cooperates with you and wants to do this for you."

$P_{3:}$ "it is just to file a case for us, but not active follow-up for people who have problems. There is no training, no suggested program, no survey that how many years have you been working, what is your problem, what do you think we should do, or at least based on your conditions, they send you to a place where there is less walking. A place where you will feel less pressure."

Legislations and regulations

The results of data analysis indicated that transferring knowledge regarding the existence of legislations, policies, and standards, and complying with them are effective ways of controlling the work conditions. Retirement laws, productivity promotion act, and health and safety regulations were three subcategories in this category extracted from the interviews.

- **Retirement laws**

Many of the participants stated that nursing is a multilateral work encompassing patient care, writing nursing records, responsiveness to physicians, managers, and patients and their families, requesting medicines and supplies, etc., which induce high physical and psychological pressure on nursing personnel. Female nurses also expressed that they have responsibilities other than work, such as housekeeping and taking care of children which aggravate their condition. Furthermore, they expressed concern about becoming disabled and unable to take care of themselves and to enjoy life after retirement. Hence, all of them pointed to the necessity of

retirement at 20 and/or 25 years of working under the support of the law of difficult and harmful occupations, especially for women. They stated that this is not only a motivation but also a help to enjoy retirement time and to be able to live independently. In this regard, two participants said:

P_5: "Now, because there is a lack of manpower, they cannot implement the laws, now there is a requirement for nurses to retire after 25 years of work, but it has not been implemented due to the lack of manpower. Because the pressure on nursing is too much, if she retires by 20 years working, she can really be healthier at the end of her life, than you are no longer capable."

P19: "After thirty years, we will become a disabled person who need rehabilitation, and if we live, we will have to spend most of the rest of our lives in physiotherapy…"

- **Productivity Promotion Act**

There are many issues in this law such as reducing the working hours of nurses, based on work history and the department of service, increasing wages during holidays and night work, prohibiting working for more than 12 hours, bringing the work of clinical staff of mental and Burns hospitals as part of hard jobs. Some participant nurses pointed to the help of "Productivity Promotion Act" in managing MSDs and stated that fewer working hours, knight shift, and overtime working have been considered for the nurses with more work experience compared with novice nurses in their wards. One of the participants stated that:

P14: "...But those who are getting older and have the possibility of such an injury are placed in the lighter wards. Now, combined shifts and night shifts, which are very long shifts of 12 hours, are given less. These strategies are for those who have a higher experience, to prevent these injuries."

- **Health and safety regulations**

Some participants expressed that a lack of description of duties and knowledge of personnel rights could lead to not referring the problems to the right person responsible for that, and also that responsible person not trying to improve the situation. Most of the interviewees stated that they had been educated by the occupational health unit of their organization, and know what to do, but the condition of the hospital, giving priority to patients' health especially in emergency situations like the stroke of patients and conditions such as falling of patients from bed, etc., do not allow them to respect the safety principles.

Some participants recommended that occupational health and safety principles should be taught in the college through a standard curriculum. They noted that having information regarding the safety and health regulations will encourage compliance with that. According to one of participants:

P11: "…Therefore, there is no point in having a law, more important than the existence of the law is its observance. The obligation of that organization to comply with the law."

- **Other laws**

Some also noted that mental health and personality tests and physical fitness tests should be taken before entering the university and the field of nursing. They also mentioned that informing students about nursing stresses should be provided at the start of university education. One of the participant nurses stated that:

P19: "I wish, they would take physical fitness tests like pilots. I wish they would also take physical fitness tests from students who are accepted into nursing, because physical strength is very important in this job. When I see a nurse with two or three years of work, brings me a certificate that I have lumbar disc and cervical disc, this is very bad. If there was a law that nurses would be fully approved in terms of physical health, then she would go to study nursing..."

Discussion

Guidelines for occupational health advocate a biopsychosocial strategy with a primary focus on early intervention through the establishment of a supportive network to manage musculoskeletal problem-related sickness absence. Widespread agreement now exists among various occupational health recommendations that managing MSDs should pass through the process of diagnosis, identification of any potential psychosocial barriers to recovery, and most importantly advice for remaining at work or early return to work.[31] Hence, collaboration between employer and worker and support from health professionals are required to facilitate workers' remaining at work or faster returning to work.[31,32]

This qualitative study aimed to investigate the perspectives of nurses with WMSDs concerning sustaining work despite these complaints. Four main individual, organizational, and intersectoral categories and 15 subcategories were extracted and discussed below.

Regarding the category of education, participants of this study proposed that active timely education on safety and health principles and sport can reduce the occurrence of musculoskeletal pain and its consequences,

and therefore help work retention. Previous studies also showed that knowledge of ergonomics principles and working condition can help reduce work-related injuries in nursing personnel, and damage will, therefore, decrease as awareness rises.[33,34] Findings of a systematic review also revealed that ergonomic training intervention reduced the risk of MSDs, and computer users who suffer from these problems may benefit from the training which planned to engage dynamically, stimulate participation, and assist its application for long time. However, its effect on work outcomes and productivity should be investigated.[35]

Further, educational intervention regarding ergonomics and its appropriate application for the prevention of WMSDs including knowledge of the relationship between repetitive motions and WMSDs development, workstation adjustments and training stretching exercises, ergonomic risk factors, problem solving, ergonomics principles, and strategies for the promotion of self-efficacy provided to manual workers of a factory showed improvement in understanding, attitude, and behavior of workers.[36] In contrast, an overview of systematic reviews with low to moderate evidence showed that ergonomic training alone or combined with other interventions was ineffective in reducing physical demand and MSDs in workers. Inadequate identification of risk factors, lack of scientific evidence on the type of ergonomic training, difficulty in finding the effectiveness, and ambiguous results were reported as the causes of these findings.[37]

In addition, a recent prospective cohort of the Danish general working population with registered follow-up showed that micro exercise, e.g., simple stretching and strengthening exercises for 10 min, three times a week at the workplace decreased the risk of long-term sickness absence and have the potential to promote general health.[38] Results of previous systematic reviews also advocated workplace physical activity and strength training in this domain to reduce sickness absence.[39,40]

Participants also stated the need for psychological support, because of the high level of stress and pressure they were exposed to at the hospital. A psychological therapy known as cognitive behavioral therapy uses methods to alter thoughts and behavior to control difficulties.[41,42] Accordingly, a systematic review of the effect of cognitive behavioral therapy for Low Back Pain (LBP) revealed positive long-term effect on pain, disability and quality of life compared to being on waiting list or usual care and other active treatments for LBP patients. Although inconsistent results were expressed for work disability which was investigated through self-reported missed workdays.[42] In contrast, Finnes *et al*. showed positive effect of psychological therapy on sickness absence versus usual care for mental and musculoskeletal problems.[43]

With respect to a category of workplace adjustments, participants of this study expressed the insufficient number of nurses as a major challenge to manage musculoskeletal problems that lead to high workload and pressure on existing staff. They noted that an adequate number of nurses should be provided and distributed scientifically. The shortage in nurses is a global issue in the healthcare system across the world.[44] Heavy physical workload, work under time constraint, sleep troubles, catching infection, and insufficient staffing were reported as perceived causes for sick leave among nursing personnel in a survey study in Norway. The study concluded that strategies like supervising nurses' workload and time, considering working schedules according to staff ability, and providing adequate nursing staff for preventing stress and excessive workload should be considered seriously.[45]

Work conscience and organizational commitment were other workforce-related factors stated by interviewees as motivators for continuing their work. Higher organizational commitment levels promote the person's sense of belonging and identification with the organization, increasing their motivation to pursue organization's objectives and activities, and decreasing the likelihood of absenteeism and turnover. It also improves the willingness of personnel to stay within the organization.[46-48]

Most of the interviewees in our study pointed to the lack of standard equipment at their workplace as a reason for aggravating their health conditions. Accordingly, studies have shown positive results of the establishment of patient handling equipment and organizational commitment to occupational safety policies including a decrease in injury rate, reduced fatigue, improved job satisfaction, reduced pain while working, and sustaining work.[49-52]

Almost all the participant nurses in this study agreed with modifying workplace and work conditions as the main facilitators for relieving their pain and staying at work. Results of a prospective two-year multinational cohort study also indicated that adaptation to the workplace, job duties, and working hours were effective on return to work after sick leave due to Low Back Pain (LBP).[53] Further studies found that workplace supports are crucial in enabling persons with MSDs to continue working. These supports might take the form of changes to the job conditions (such as flexible hours or locations) or to the physical conditions of workplace (such as equipment or better access).[25,54]

Financial incentives were mentioned by some participants as a motivator for continuing the work in spite of WMSDs. A US nationwide survey study of intensive care unit nurses declared that effort-reward imbalance had a stronger relationship compared to job strain with MSDs. It also had a similar or stronger impact on the occurrence of MSDs than the combined variables of the job demand-control and effort-reward models.[55]

Further, results of a systematic review indicated that work-related psychosocial factors appear to be associated with MSDs. Particularly, it was discovered that low social support, exposure to high demand/low control, and effort-reward imbalance was all linked to lower back, neck, shoulder, upper extremity, knee, and/or pain in other anatomical part in nurses and aides. The study also concluded that although ergonomics risk factors are considered in planning the preventive strategies at the workplace, altering the psychosocial work environment might reduce MSDs and their consequences.[7]

Regarding the category of supportive culture, the findings of this study indicated that taking responsibility for managing MSDs by participants was an important strategy. It includes doing physical exercises, respecting the medical team's advices and prescriptions, and compliance with safety principles. In this regard, a systematic review and meta-analysis by S. Elbers *et al.* showed a slight positive effect of self-management on physical function, pain intensity, and self-efficacy for patients with chronic musculoskeletal pain in the long-term, but studies showed great difference in terms of intervention's content.[56]

According to this study's findings, occupational health and safety culture was mentioned as a prerequisite for preventing WMSDs and their consequences. Nurses will be provided with a safe workplace, in which to practice without risk of being injured, in an environment that gives priority to ergonomics principles and implements a structured program.[19,49,57]

Results of this study revealed that being recognized by superiors and being allowed to communicate with them freely are major contributors to remaining at work despite pain. Study participants noted that support from managers and colleagues and also their superiors' commitment to the health of their staff have important effects on their motivation to work. This is also confirmed in previous studies.[19,57] Findings of a meta-synthesis also suggested that the organizational culture and social environment have an impact on employees' capacity to obtain workplace support and manage musculoskeletal problems at work.[58]

Another study also explained that the labor–management relationship and the top management's commitment to wellbeing, health, and safety of their personnel appeared to be key factors in the success of remaining at work or return to work programs. The experiences of many stakeholders in that study revealed the significance of trust, respect, communication, and labor relations in the success or failure of RTW programs for injured personnel.[19] The necessity to express illness is a major issue for employees to acquire support, necessitating assurance that this information will be treated positively to devise appropriate solutions.[25,54] The role of management commitment to safety principles, safety education, and feedback on safety participation and reduction of the risk of occupational hazards among employees has been supported in another study.[59] In another qualitative study on the management of return to work among employees also, this was stated that workers will collaborate in their return-to-work process if they believe that the employer is concerned about them.[19]

Participants pointed to the necessity of accepting sick leave by their managers to be refreshed and recovered; however, some contrasted it with taking sick leave for reasons such as adding to colleague's workload, nurses' shortage, and reduced benefits. Other studies found that experiencing sick leave/sickness absence may have positive or negative consequences for individuals. Their results showed that some may feel hopeless and miss the motivation, and others may plan for early recovery to return to work and seek support.[60] Another qualitative study indicated that a large number of sickness absence in nurses because of organizational, physical, and emotional reasons leads to staff shortages, and consequently extra work demands, further sickness absence, and problem in job maintenance. This also disrupts service delivery and has a negative financial impact on the healthcare system.[4]

One of the important factors in managing the musculoskeletal pain expressed by participant nurses was collaboration and coordination between the involved stakeholders to facilitate and accelerate the recovery. This is confirmed in other studies indicating that in order to reduce the risk of MSDs and their consequences, occupational health specialists, employers, and injured employees should collaborate to devise workplace wellbeing strategies. This collaboration increases understanding of and willingness to follow these strategies by employees.[58,61]

Regarding the category of legislations and regulations, most of the participants advocated retirement with 20 or 25 years of working as a nurse to be able to live healthy and independently at retirement. Accordingly, a survey of early retirees due to MSDs indicated deterioration in self-reported health of men of any age, and women at age 25–54 compared to controls. However, female retirees at age 55–64 reported improved health status.[62]

Some participants pointed to the application of "Productivity Promotion Act" principles as contributing to staying at work in spite of WMSDs. This act includes reducing the working hours and long and knight shifts for workers with higher work experiences and strategies like these. Findings of two cross-sectional studies showed that there was no significant difference in the level of job satisfaction of nurses before and after the following of the productivity promotion act. It was sort of able to meet the expectations of nurses in the dimension of salary. There was also a significant increase in one study in the dimensions of appreciation and recognition, but satisfaction decreased significantly in the dimensions of management and supervision.[63] In another study, it was successful in meeting the communication dimension of the job expectations. However, it has not been very successful in terms of career development, although the effect on job retention was not investigated directly in these studies.[64]

Some participants stated that it could be helpful to examine the physical fitness of nursing students prior to entering the university to preserve their musculoskeletal health. Accordingly, studies showed a relationship between physical fitness and the risk of WMSDs. They reported the improvement of student fitness as a factor for musculoskeletal health and continuous working.[65,66]

This study's findings implied that most of the strategies for reducing the occurrence of MSDs and consequences can also help in sustaining work despite pain (primary and secondary prevention). Awareness, training, and hazard reduction were recognized as important in the prevention of MSDs in other qualitative studies.[22] Participants of another qualitative study also reported the education, equipment, health and safety policies, and mutidisciplinary collaboration as effective solutions to reduction of MSDs. However, age, being informed, presence of equipment, individual and contextual factors, the shortage of human resources, and time pressure were stated as obstacles to the implementation of these solutions.[14]

Overall, our study results are in line with previous systematic reviews on qualitative research in the general population for staying at work despite musculoskeletal pain. Those studies also found that study participants perceived collaboration between stakeholders including the affected workers, self-management, and workplace adaptations as important to help them stay at work.[67,68]

Limitations and recommendations

This study was performed using a qualitative approach, and on the limited number of nurses in the culture and context of Iran. Hence, generalization of the findings may not be possible simply. The fact that the participants did not confirm the extracted categories and subcategories could be seen as another limitation of the study. The perspective of other stakeholders in helping injured nurses remain at work such as occupational health professionals and rehabilitation experts should also be investigated to complement these findings. Simple and economic strategies also should be investigated through studies with a robust methodology.

Conclusion

The participant nurses in this study had been able to continue working despite suffering from musculoskeletal complaints. However, they worried about individual, organizational, and intersectoral barriers and difficulties they confronted with. Participants recommended that the provision of timely related education, sufficient nursing workforce, adequate related equipment, workplace and working conditions adaptations, supporting culture, and related policies and regulations can facilitate staying at work and managing their musculoskeletal pain. Health policy makers and managers and occupational health and safety experts should consider the findings of this study for developing and implementing proactive and tailored strategies according to their organizations' context to reduce the occurrence of MSDs and consequences. Considering the perspective of persons with WMSDs about effective interventions and policies that might help them continue the profession despite having these problems is important to enhance compliance with those interventions.

Ethical considerations

Ethical approval for this study was obtained from the Ethics Committee of the Iran University of Medical Sciences (IR.IUMS.REC.1397.432). Voluntary participation, anonymity, confidentiality of information, freedom to leave the study at any time, and the disposal of files after reaching to results were ethical standards considered in this study.

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Conflicts of interest

There are no conflicts of interest.

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