Middle East Journal of Nursing

April 2014

VOLUME 8 ISSUE 2

ISSN 1834-8742

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FROM THE EDITOR

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This is the second issue of the Middle East Journal of Nursing this year. The number of papers being received in the journal and the quality has improved tremendously. The journal has become one of the highest read journals in the field in the region.

A cross-sectional exploratory study carried out among the registered nurses in a major teaching and research hospital in Bahrain. The Barriers to Research Utilization Scale (Barriers Scale) was used to collect the data. The author stressed that nurses play a vital role in using the best available research evidence to provide optimal care for patients. Despite the importance of nurses' uptake of research utilization, little is known about the uptake of research utilization among nurses in Bahrain. The results showed that the top three ranked perceived barriers were lack of authority to change practice, inadequate facilities and time constraints. Of the top 10 ranked perceived barriers, six items were related to the subscale 'organization' (the setting) and four to the subscale 'presentation' (report and accessibility of research findings). The auhors concluded that if research utilization is to be enhanced in Bahrain, the local organizational barriers need to be addressed. An important step is to create an organizational environment that recognizes the value of research and encourage and support nurses' research activities.

A paper from Tehran looked at menopausal women's sexual function and related factors in west of Tehran. A descriptive cross-sectional model was followed where, 163 volunteer healthy married postmenopausal women, whom had been visited in selected health centers in west of Tehran, enrolled. Data were collected by using demographics questionnaire and Sabbatsberg Sexual Rating Scale (SSRS). Data were analyzed by using independent t-test, ANOVA and Pearson correlation coefficient. The results showed that sexual function had a significant relationship with employment status, educational level, number of children, number of children at home, frequency of sexual intercourse per month and sexual satisfaction. On the other hand, sexual dysfunction had no significant relationship with women's age, husband's age, age of menopause, duration of marriage, number of children and economic status. The authors concluded that sexual function in postmenopausal period can be influenced by some social and personal characteristics. By understanding and knowing these characteristics, Health care providers could prepare suitable guiding and counseling for each target group for improving their sexual function and quality of life.

A paper from Amman looked at the effect of combined interventions of diet and physical activity on The perceived and actual risk of coronary heart disease among women in north of Jordan. The authors followed an experimental pretest/ posttest design was used. The sample consisted of asymptomatic women aged 40 years or older who lived in the north of Jordan. The intervention involved recommendations concerning healthy diet and physical activity to modify the actual risk for coronary heart disease. The Kruskal-Wallis test; $X2(2, N = 134) = 46.62$, $p< 0.001$, showed that women who applied both diet and physical activity interventions scored lower actual risk for heart disease than women who only applied one type of intervention (either diet or physical activity). The authors concluded that the results indicated the need for constant national heart disease education programs for women emphasizing adopting healthy lifestyle behaviors.

Cancer remains of great of interest especially in the nursing field. A paper reviewed cancer pain management. The author stressed that optimal pain management required a systematic symptom assessment and appropriate management to promote quality of life. Inadequate management of pain is the result of various issues that include: under treatment by clinicians with insufficient knowledge of pain assessment and therapy; inappropriate concerns about opioid side effects and addiction; a tendency to give lower priority to symptom control than to disease management; patients under-reporting of pain and non-compliance with therapy. The authors elaborated on all the above aspects, including the pathophysiology of pain, assessment and management of cancer pain; to understand the clinical approach used in managing cancer related pain.

A second paper discussed the relationship between Type 2 Diabetes and Cancer. The author stated that there is evidence to suggest that type 2 diabetes may increase the risk of incidence of cancer. Type 2 diabetes characterized by insulin resistant and hyperinsulinemia. Hyperinsulinemia may lead to cancer through insulin's effect on its cognate receptor and the insulin-like growth factor system. The author reviewed 9 articles between 2009-2013. There is substantial evidence that suggests that people with type 2 diabetes have an increased risk of developing several types of cancers.

A SURVEY OF NURSES' PERCEIVED BARRIERS TO RESEARCH UTILIZATION IN BAHRAIN IN COMPARISON TO OTHER COUNTRIES

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Abstract

Background: Nurses play a vital role in using the best available research evidence to provide optimal care for patients. Despite the importance of nurses' uptake of research utilization, little is known about the uptake of research utilization among nurses in Bahrain.

Objectives: This study investigated the perceived barriers to research utilization in Bahrain and compared the barriers to those of other countries.

Methods: This is a cross-sectional exploratory study carried out among the registered nurses in a major teaching and research hospital in Bahrain. The Barriers to Research Utilization Scale (Barriers Scale) was used to collect the data.

Results: The results showed that the top three ranked perceived barriers were lack of authority to change practice, inadequate facilities and time constraints. Of the top 10 ranked perceived barriers, six items were related to the subscale 'organization' (the setting) and four to the subscale 'presentation' (report and accessibility of research findings).

Conclusions: If research utilization is to be enhanced in Bahrain, the local organizational barriers need to be addressed. An important step is to create an organizational environment that recognizes the value of research and encourages and supports nurses' research activities.

Key words: Bahrain, barriers, Barriers Scale, evidence-based practice, research utilization

Introduction

Over the past two decades, nurse leaders have attempted to address the issue surrounding the utilization of research in practice. They have emphasized the use of scientific evidence-based research to improve patients' quality of care.(1) Swan et al(2) argued that nurses need to implement the best available evidence to optimize patient care and meet the challenges facing health services. Despite increasing efforts by nurse leaders to promote the utilization of research in nursing practice, it is still a challenge and the uptake is slow. It has been postulated that this persistent gap is due to a range of barriers that hinder the nurses in implementing evidence-based clinical practice. To bridge the gap between what is known and what transpires in practice, a common approach is to identify barriers for changing practice.

Barriers to research utilization have been extensively explored in Western countries including the United States (USA),(3, 4) United Kingdom (UK),(5-7) and Scandinavia.(8, 9) The relevance and applicability of these findings to nursing practice in Bahrain must be considered cautiously, because the health care system and professional culture from Bahrain is different from these countries.

Only recently studies have explored research utilization among the nurses in the Middle East where the culture and delivery of health care, including nursing, are significantly different from Western countries. A Turkish study found the lack of time to implement new ideas was the most frequently perceived barrier. Another two Turkish studies found the main barrier was inadequacy of facilities to implement research.(10, 11) An Iranian study found barriers to research utilization were time

constraints, inadequate facilities and lack of autonomy of nurses to change nursing practice.(12) Another Iranian study found that in general, nurses held positive attitudes toward research; however, the majority of nurses were not convinced of the importance of research to nursing practice and to the nursing profession.(13)

To our knowledge, no study has investigated Bahraini nurses' perceptions of barriers to research utilization and this study was conducted to fill that gap. The aims of this study were to identify perceived barriers to research utilization in Bahrain and to compare the barriers to those of other countries.

Methods

This is a cross-sectional exploratory research design. A convenience sample of registered nurses was recruited from a large tertiary government hospital in Bahrain which functions as the center of teaching and research for health professionals. This hospital has 54 wards and 946 beds. At the time of the survey, the total number of nurses in Bahrain was estimated to be 3,037, of which 256 were males and 2,781 were females.(14)

The inclusion criteria for the study were: registered nurses, more than one year of nursing experience, and aged 20 years or over. Exclusion criteria were: student nurses and practical-trained workers with no nursing degree.

Procedure

Data were collected during December 2008. Six weeks before the commencement of the survey, a set of questionnaires, an explanatory statement and the approval letter from the Ministry of Health, Kingdom of Bahrain were sent electronically to the Chief of Nursing Services of the hospital to seek permission to conduct the study. After permission was granted, two weeks before the commencement of the study, a flyer and the invitation to participate in the study was sent to the nursing administration to be distributed to the wards. In addition all head nurses and ward supervisors in nursing administration were informed of the study.

The researcher delivered the questionnaires to the ward supervisors or acting senior nurses who then distributed them to the nurses. The participants were asked to return the completed questionnaire in a sealed envelope to their ward supervisors, or to the boxes placed in the nursing administration area. All responses were anonymous. One week after the distribution of the questionnaire an electronic mail was sent to the wards to remind those nurses who had not completed the questionnaire, followed by a second reminder one week later. In addition, the researcher regularly visited the clinical areas to answer questions and was in constant contact by phone with supervisors to track the number of returned questionnaires.

Instrument

The data was collected using the Barriers to Research Utilization Scale (Barriers Scale) which is the most widely used standard of measurement for the nurses. The Barriers Scale was originally developed in the USA in the 1980s and modified by Funk et al.(3) The theoretical foundation for the development of the Barriers Scale was Rogers' diffusion of Innovations theory.(15) Diffusion theory is the process by which an innovation is communicated through particular channels over time among the members of a social system. The Barriers Scale consists of four subscales: (1) 'nurse' refers to the individual nurse's research values, skills and awareness; (2) 'organization' refers to the barriers and limitations imposed by the setting; (3) 'research' refers to the characteristics and quality of study evidence; and (4) the 'presentation' refers to the report and accessibility of research findings.

The Barriers Scale asks participants to rate on a five-point Likert scale the extent to which they consider each of the 29 items as a barrier to research utilization. The response options range from 1 to 5 with 1: to no extent, 2: to a little extent, 3: to a moderate extent, 4: to a great extent, 5: no opinion. The factor analysis found the item: 'the amount of research information is overwhelming' failed to load on any factor, but was retained based on the feedback from clinicians and administrators.(3) A high mean score signifies a greater barrier. Most studies that used the Barriers Scale presented their findings in rank order, based on the percentage of participants agreeing with each item being a moderate or great barrier to research utilization.

The reported internal consistency reliability of the instrument was modest.(3) The Cronbach's alpha of each subscale was: nurse = 0.80; organization = 0.80; research = 0.72; and presentation = 0.65. To determine the internal consistency of the instrument on this sample, Cronbach's alpha coefficient was performed. The Cronbach's alpha for this study ranged from 0.63 to 0.78, which was lower than that reported by Funk et al.(3)

Ethical considerations

Approval to conduct the study was sought and granted by an Australian University Human Ethics Committee where the third author was studying, as well as the research technical support team from the Ministry of Health, Kingdom of Bahrain.

Data analysis

The analyses were performed using the SPSS Version 17 (SPSS Inc., Chicago, IL, USA). The results were presented using descriptive statistics (counts, percentages, means and standard deviations). The response options "to a great extent" and "to a moderate extent" were merged into one category.

Results

Participant characteristics

A total of 250 questionnaires were distributed and 219 were returned, giving a response rate of 87.6%. Two hundred and one (93.5%) female nurses and 14 (6.5%) male nurses participated in the study. The majority of the participants were staff nurses (88.5%), followed by ward supervisors (9.1%). The majority of nurses (87.6%) were in the age group 20-45 years. The average age for the participants was 35 years. Eighty three (38.4%) of nurses held a Diploma degree and sixty six (30.6%) held a Bachelor degree. Sixty six nurses (30.6%) had 11-15 years of nursing experience and the average was 12 years. Details of the demographic characteristics are presented in Table 1.

Characteristic	N	%
Gender:		
Female	201	93.5
Male	14	6.5
Age (year):		
20-25	12	5.6
26-35	118	54.6
36-45	59	27.3
46-55	25	11.6
>55	2	0.9
Highest education:		
Diploma	83	38.4
Associate degree	59	27.3
Bachelor degree	66	30.6
Master degree	8	3.7
Professional role:		
Ward supervisor	19	9.1
Staff nurse	187	88.5
Nurse educator	3	1.4
Nursing experience (year):		
1-5	43	19.9
6-10	55	25.5
11-15	66	30.6
16-20	24	11.1
21-25	20	9.3
26-30	7	3.2
>30	1	0.5

Table 1: Demographic profile of the participants

Perceived barriers to research utilization

When “moderate” and “great extent” of the barriers were combined and analyzed, the top three perceived individual items were related to the subscale organization, ‘the nurse does not feel she/he has enough authority to change patient care procedures’ (72%); followed by ‘the facilities are inadequate for implementation’ (69.9%); and ‘there is insufficient time on the job to implement new ideas’ (62.4%). Of the lowest three ranked items, two were related to the subscale research and one to the subscale nurse. The three lowest ranked items were ‘the conclusions drawn from the research are not justified’ (38%); ‘there is not a documented need to change practice’ (40.4%) and ‘the nurse is uncertain whether to believe the results of the research’ (42.0%).

Of the top 10 items perceived as a barrier, six were related to the subscale organization and four to the subscale presentation. Of the least 10 items perceived as a barrier, four were related to the subscale nurse, three to the subscale research, two to the subscale presentation and one individual item which was not included in any of the subscales: ‘the amount of research information is overwhelming’. The ranked order of the perceived barriers to research utilization is presented in Table 2 (next page).

In terms of the subscale, the highest barrier was organization and the least barrier was research. The mean values and the standard deviation for each of the subscales were as follows: organization (2.78, SD 0.64), presentation (2.73, SD 0.58), nurse (2.58, SD 0.61), and research (2.53, SD 0.49).

Comparison between Bahrain and other countries

To date, there have been a significant number of studies conducted on research utilization among nurses worldwide using the Barriers Scale. In the selection of the studies for comparison, we decided on those who used the Barriers Scale in the last five years; these are presented in Table 3 (page 7). Regardless of the country, the greatest barrier was related to the subscale organization, however there were differences on the individual items within the subscale.

Of the ten studies; three studies, one from USA,(16) one from Hong Kong,(17) and one from Turkey(11) reported ‘the lack of authority to change patient care procedures’ as the greatest barrier to research utilization. This individual item was reported in the top three of all the studies, except for a more recent study conducted in Turkey where it was ranked nine.(18) Three studies; one from Hong Kong(19) and two from Turkey(10, 18) reported ‘inadequate facilities for implementation’ as their greatest barrier. Three studies; one from USA,(20) one from Turkey(21) and one from Iran(12) reported time constraints as the greatest barrier. One Swedish study reported feeling isolated from experienced colleagues to discuss research as the greatest barrier.(22)

Discussion

In this study, the highest subscale barrier was ‘organization’. This was a surprising finding given that the study was conducted in a hospital which functions as the center of teaching and research for health professionals.

Item		N	(%)
1.	The nurse does not feel she/he has enough authority to change patient care procedures	157	(72.0)
2.	The facilities are inadequate for implementation	153	(69.9)
3.	There is insufficient time on the job to implement new ideas	136	(62.4)
4.	The nurse does not have time to read research	131	(59.8)
5.	Implications for practice are not made clear	130	(59.4)
6.	Research reports / articles are not published fast enough	128	(59.0)
7.	The nurse feels results are not generalizable (relevant) to own setting	128	(58.7)
8.	Physicians will not cooperate with implementation	125	(57.6)
9.	Research reports / articles are not readily available	125	(57.3)
10.	Statistical analyses are nit understandable	122	(56.0)
11.	Other staff are not supportive of implementation	120	(55.0)
12.	The relevant literature is not completed in one place	115	(53.0)
13.	The nurse is unwilling to change / try new ideas	114	(52.5)
14.	The nurse sees little benefit for self	114	(52.5)
15.	Administration will not allow implementation	113	(52.1)
16.	The nurse feels the benefits of changing practice will be minimal	110	(50.5)
17.	The literature reports conflicting results	109	(50.2)
18.	The research has not been replicated	109	(50.0)
19.	The nurse is isolated from knowledgeable colleagues with whom to discuss the research	107	(49.3)
20.	The amount of research information is overwhelming	101	(46.3)
21.	The nurse is unaware of the research	100	(46.3)
22.	The research is not reported clearly and readably	100	(46.1)
23.	The nurse does not feel capable of evaluating the quality of the research	99	(46.0)
24.	The nurse does not see the value of research for practice	97	(44.7)
25.	The research has methodological inadequacies	96	(44.0)
26.	The research is not relevant to the nurses' practice	95	(43.6)
27.	The nurse is uncertain whether to believe the results of the research	92	(42.0)
28.	There is not a documented need to change practice	88	(40.4)
29.	The conclusions drawn from the research are not justified	82	(38.0)

Table 2: Rank order of barriers to research utilization

Author	Sample	Greatest barrier	Second greatest barrier	Third greatest barrier
This study	Bahrain N = 219 Mixed setting Clinical nurses = 187 Supervisors = 19 Nurse educators = 3	The nurse does not feel she/he has enough authority to change patient care procedures	The facilities are inadequate for implementation'	There is insufficient time on the job to implement new ideas
Aktinson et al. 2008	USA N = 249 Community Clinical nurses = 213 The role of 36 participants not reported	The nurse does not feel she or he has enough authority to change patient care procedures	There is insufficient time on the job to implement new ideas	Nurse does not has time to read research
Boström et al. 2008	Sweden Community aged care Clinical nurses = 140	The nurse is isolated from knowledgeable colleagues with whom to discuss the research	The facilities are inadequate for implementation	The relevant literature is not compiled in one place
Chau et al. 2008	Hong Kong Mixed setting Clinical nurses = 1,156 Nursing officers = 166 Ward/Department Operational managers = 36 Nurse specialists = 29 Advanced practice nurses = 40 Others = 31	The facilities are inadequate for implementation	Lack of authority to change practice	Lack of time to implement new ideas
Mehrdad et al. 2008b	Iran Mixed setting Clinical nurses = 316 Head nurses = 59 Nurse educators = 35	The nurse does not have time to read research	Facilities are inadequate for implementation	Nurses do not feel they have enough authority to change patient care procedures
Kocaman et al. 2009	Turkey Mixed setting Clinical nurses = 329	There is insufficient time on the job to implement new ideas	Research reports/ article are written in English	The facilities are inadequate for implementation
Yava et al. 2009	Turkey Medical/surgical wards Clinical nurses = 549 Nurse managers = 74 Nurse educators = 8	The nurse does not feel she / he has enough authority to change patient care procedures	The nurse does not have time to read research	The facilities are inadequate for implementation
Brown et al. 2010	USA Mixed setting Clinical nurses = 226 Nurse managers = 107 CNS/Nurse educator s = 48 NPs/Midwifes = 105	The nurse does not have time to read research	There is insufficient time on the job to implement new ideas	The nurse does not have authority to change patient care
Chien 2010	Hong Kong Mixed setting Clinical nurses = 550	The nurse does not feel she has enough authority to change patient care procedures	There is insufficient time on the job to implement new ideas	The nurse does not feel capable of evaluating the quality of research
Uysal et al. 2010	Turkey Medical/surgical wards Clinical nurses = 216	The facilities are inadequate for implementation	The relevant literature is not compiled in one place	Physicians will not cooperate with implementation
Sari et al. 2012	Turkey Mixed setting Clinical nurses = 622 Head nurses/ supervisors/ directors = 96	The facilities are inadequate for implementation	The relevant literature is not compiled in one place	The nurse is unaware of the research

One would expect the institution to support the nurses in using research evidence in their practice. Nevertheless the finding supports the integrative review on the Barriers Scale undertaken by Carlson et al,(23) who commented that studies using Barriers Scale have a high degree of consistency, suggesting that barriers to research utilization by nurses have not changed.

The ranking of each item in this study has shown considerable consistency with those reported in other studies. In this study the highest ranked item was the 'lack of authority to change practice'. Interestingly, this item was also found to be the highest ranked barrier in several countries which have different health care systems to Bahrain. The second highest ranked barrier was related to inadequate facilities. Compared to the other studies, this was consistent with the Swedish study(22) as well as an Iranian study.(12) The third highest barrier was the lack of time to implement new ideas, a similar finding to the study conducted in Hong Kong.(19)

These findings suggest that organizational support is imperative to research utilization. Nurses need to feel empowered to change practices in their clinical setting and not be constrained by the bureaucratic demands of a hierarchical organization. According to Mulhall,(24) it is misleading to dichotomize those carrying out research and those acting in organizational roles as unrelated; rather they should be seen in the context of a whole system. There is a need to procure resources to support and sustain the nurses to increase the nurses' research activity.

The study conducted among Iranian nurses(12) reported the lack of time to read research as their greatest barrier and the lack of authority to change practices as their third greatest barrier. This may be explained by a greater number of senior nurses participating in the study. In this study, 9.1% were ward supervisors and 1.4% were nurse educators compared to 14.4% head nurses and 8.5% nurse educators in the Iranian study. Nurses in higher positions within a hospital hierarchy are likely to have more authority than those at lower levels and would have higher degrees of autonomy and empowerment to change practices.(25)

It is not surprising that time constraints were ranked within the top three, with lack of time to implement new ideas ranked third, consistent with other studies.(26, 27) Lack of time as a major barrier to research utilization, reflects a serious long-standing problem that exists world- wide.(25)

There were several limitations in this study. This study was carried out in a large teaching and research hospital; thus the findings may not be generalized to all Bahraini nurses in other settings. There may be reporting bias associated with the self-report method which raises questions about the extent to which the responses accurately represent all nurses' perceptions of the barriers to research utilization. The internal consistency of the instrument is relatively low.

Conclusions

This study identified the perceived barriers to research utilization among Bahraini nurses in a major teaching hospital. The findings showed considerable consistency with those reported by the nurses from other countries. In this study, the organization was a significant barrier to research utilization. The greatest individual item reported was the lack of authority to change practice. Although this study found no differences in the barriers to research utilization compared to other countries, this is the first study of its kind conducted in Bahrain. If research utilization is to be enhanced in Bahrain, the local organizational barriers need to be addressed. An important step is to create an organizational environment that recognizes the value of research and encourages and supports nurses' research activities.

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EFFECT OF COMBINED INTERVENTIONS OF DIET AND PHYSICAL ACTIVITY ON THE PERCEIVED AND ACTUAL RISK OF CORONARY HEART DISEASE AMONG WOMEN IN NORTH OF JORDAN

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Abstract

Background and Aim: Women have received little attention in cardiac research in Jordan. This study aimed to evaluate the effectiveness of combined interventions of diet and physical activity on the perceived and actual risk for coronary heart disease among women in the north of Jordan.

Methods: An experimental pretest/posttest design was used. The sample consisted of asymptomatic women aged 40 years or older who lived in the north of Jordan. The intervention involved recommendations concerning healthy diet and physical activity to modify the actual risk for coronary heart disease.

Results: The Kruskal-Wallis test; $X2(2, N = 134) = 46.62$, $p< 0.001$, showed that women who applied both diet and physical activity interventions scored lower actual risk for heart disease than women who only applied one type of intervention (either diet or physical activity).

Conclusion: The results indicated the need for constant national heart disease education programmes for women emphasizing adopting healthy lifestyle behaviors.

Key words: Coronary heart disease, Diet, Physical activity, Women, Risk.

1. Introduction and Background

Cardiovascular disease (CVD) and stroke are rapidly growing problems, and are the major causes of illness and deaths in the Eastern Mediterranean Region, accounting for 31% of deaths (Khatib, 2004).

Jordanian women were found to underestimate their risk for coronary heart disease (CHD); and perceived breast cancer as a greater risk to their health than CHD (Ammouri, et al., 2010). Despite that, 28.9% of deaths among women in Jordan were attributed to CHD and 23.5% were due to breast cancer (JMOH, 2011). The majority of research on Jordanian women's health has focused exclusively on reproductive health aspects (AL-Qutob, 2001) and screening for breast cancer (Petro-Nustus and Mikhail, 2002), and so far no study has been performed which investigates the perceived and the actual risk of coronary heart disease and or interventions that could reduce the risk of CHD among women in Jordan.

This study aimed to assess the perceived risk and the actual risk for coronary heart disease among women in the north of Jordan. This study also aimed to evaluate the effectiveness of combined interventions of diet and physical activity on the perceived and actual risk for coronary heart disease among women in north of Jordan.

Research Methods

Setting and Sample

A true experimental pretest/ posttest study was conducted among a convenience sample of women who visited the out-patients department at a university hospital and at a government hospital (hospitals are located in the Irbid governorate). The inclusion criteria of the sample were age is equal to or more than 40 years, willing to participate and not

known to have CHD. The sample size was estimated using power analysis which yielded a sample size of 159 participants. In this study, the researcher gathered data from 165 women to avoid the attrition risk.

Procedure

Phase One: Pretest Phase

After obtaining the approval to conduct the study from the Committee on Human Research, the Jordanian Ministry of Health, and the university hospital, the researcher visited the out-patient department of each setting, where the women were invited to participate in the study. Those who accepted to participate in the study were asked to read and sign the informed consent form. The form explained the purpose of the study, supplied the woman with information about her rights as a participant, and included directions for completing each of the forms. In adherence with ethical standards, the informed consent form also included information regarding confidentiality, the intervention involved in the study, and a statement regarding the participants' ability to withdraw from the study at any time without penalty.

After signing the informed consent form, each woman completed the survey forms; Demographic information sheet, and the Perception of Risk of Heart Disease Scale (PRHDS). The PRHDS is a newly developed and previously tested 20-item questionnaire composed of three subscales: dread risk, risk and unknown risk (Ammouri and Neuberger, 2008). These subscales are intended to place individuals on a continuum from low perception of risk to high perception of risk of CHD.

Dread risk, was defined at its high end as perceived lack of control, dread, catastrophic potential, fatal consequences; while unknown risk, was defined at its low end as perception of hazards judged to be unobservable, unknown, new and delayed in their manifestation of harm; and (in between) risk reflecting a hazard that has few moderate known outcomes and consequences (Ammouri and Neuberger, 2008).

Items were formatted using a four-point Likert scale ranging from 1-4 (strongly disagree to strongly agree). To score the instrument, item scores were summed for each subscale, as well as across subscales for a total scale score; reverse scoring of negative-response items is required (Ammouri and Neuberger, 2008). Higher scores on the PRHDS subscales indicate a higher perception of risk of CHD. Cronbach's alpha internal consistency reliability coefficients of the original PRHDS were .80, 0.72 and 0.68 for the dread risk subscale, the risk subscale, and the unknown risk subscale respectively, with a total scale reliability of .80 (Ammouri and Neuberger, 2008). A test-retest correlation coefficient was also calculated for the original version and yielded a total reliability of 0.72 with 0.76 for the dread risk subscale, 0.70 for the risk subscale, and 0.61 for the unknown risk subscale (Ammouri and Neuberger, 2008).

After completing the surveys forms, the researcher carried out the physiologic measures (body height, body weight, blood pressure, and blood glucose level). After weighing each woman with the same scale, the researcher calculated the body mass index of each woman using the results of height and weight measurements.

Regarding measuring blood pressure, the researcher measured the BP for each participant after ten minutes rest. Two independent measurements of blood pressure were obtained with an interval of at least ten minutes between them and the average BP was calculated. For the purpose of this study, hypertension (HTN) was defined as a person having a blood pressure equal to or more than 140/90 mmHg or those individuals who are on antihypertensive agents (AHA, 2010; National Institute of Health, 2002).

Regarding measuring blood glucose level, the researcher used an Accu-Check machine, test strips, lancets, gloves, and biohazard container. For the purpose of this study, a person who has diabetes is defined as someone taking insulin or oral hypoglycemic drugs, or with a fasting plasma glucose concentration above 7.0 mmol/l (126 mg/dl).

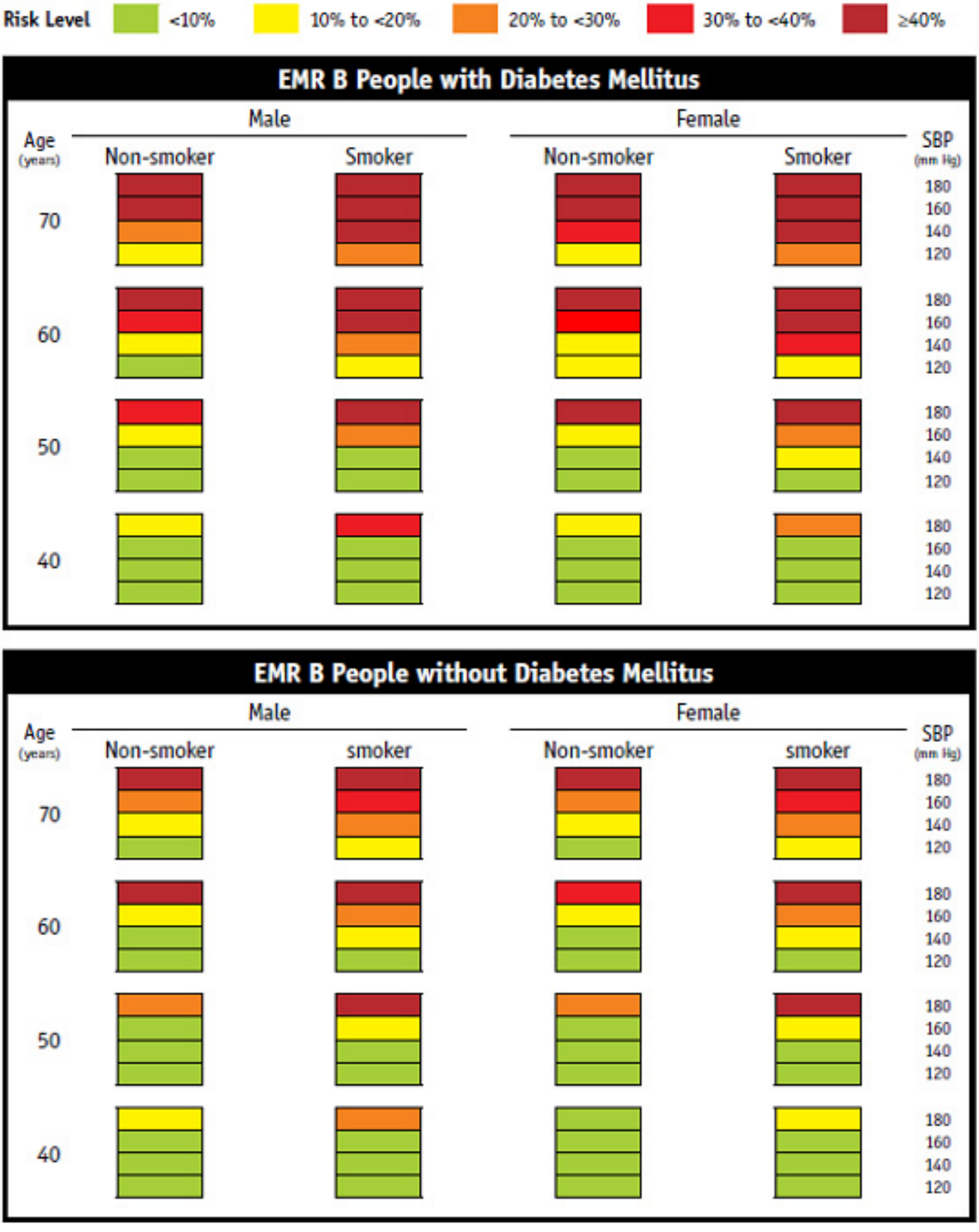
After measuring the physiologic measures, the researcher used the WHO/ISH risk prediction chart of the EMRO- B region without cholesterol level to estimate the actual risk of CHD among women (Figure 1). To estimate the actual risk using these charts, the researcher collected data about the items included in the charts; age, smoking status (all current smokers and those who quit smoking less than one year before the assessment were considered smokers for assessing cardiovascular risk), blood pressure, and presence of diabetes mellitus. Then, the researcher classified each participant into a category of high risk (30% to <40% and >40%; red and maroon color), medium risk (from 10% to <20% and from 20% to <30%; yellow and orange), or low risk (<10%; green color) for heart attack or stroke in the following ten years.

(See Charts next page)

Phase Two: Intervention Phase

In this phase, the researcher randomly assigned the participants into three groups (A, B, and C) and randomly also assigned the interventions (diet and physical activity, diet part only, or physical activity part only) to the groups. Eventually, group A was assigned to the diet part of the intervention, group B was assigned to both diet and physical activity interventions, and group C was assigned to the physical activity part of the intervention.

In this study, group B acted as the experimental group and received both components of the intervention and group A and C acted as the control groups and received only one component of the intervention; either physical activity or diet component.


Risk Level
<10%
10% to <20%
20% to <30%
30% to <40%
≥40%
EMR B People with Diabetes Mellitus
Male
Female
Age (years)
Non-smoker
Smoker
Non-smoker
Smoker
SBP (mm Hg)
70
60
50
40
180
160
140
120
EMR B People without Diabetes Mellitus
Male
Female
Age (years)
Non-smoker
smoker
Non-smoker
smoker
SBP (mm Hg)
70
60
50
40
180
160
140
120

The researcher then provided a presentation for group A about how to prevent CHD using the diet intervention only, a presentation for group B about how to prevent CHD using both diet and physical activity interventions, and a presentation for group C about how to prevent CHD using physical activity intervention only. Finally, the researcher emphasized to the women the importance of following the guidelines for 12 weeks. Each four weeks of this phase, the researcher contacted the participants in order to make sure that they were committed to the guidelines and to discuss any inquiry they had. Participants were contacted via mobile phone.

Phase Three: Posttest Phase

After 12 weeks, the women individually returned to the out-patient clinic to be reassessed for their physiologic measures and to complete the PRHDS.

Educational Materials

The educational material was developed based on the "Pocket guidelines for assessment and management of cardiovascular risk with the WHO/ISH cardiovascular risk prediction charts for WHO epidemiological sub-regions EMR-B, EMR- D" (WHO, 2007). The content of educational material was on how to prevent occurrence of coronary heart disease through following specific recommendations regarding diet and physical activity.

Regarding the recommendations about diet changes, women at risk for CHD were strongly encouraged to reduce total fat and saturated fat intake. In addition, they were strongly encouraged to reduce daily salt intake by at least one-third and, if possible, to <5 g per day. The women were encouraged to eat at least 400 g a day, of a range of fruits and vegetables, as well as whole grains. In addition, the women were strongly encouraged to take at least 30 minutes of moderate physical activity (e.g. brisk walking) a day, through leisure time, daily tasks and work-related physical activity.

Results

Sample Characteristics

Table 1 shows the demographic characteristics of the sample. The mean age of the women in the sample was 52.6 (SD = 4.4) ranging from 41 to 69 years. About 79.4% of the participants were married, and the monthly household income of 17.0% of the participants was less than 200 JD. More than half of the women (53.4%) had a high school education or higher

Risk Factors for CHD

The results indicated that 29.1% of participants were smokers, 30.9% had a family history of CHD, 60.6% were known to have DM, 50.9% were known to have HTN, and 28.5% were obese (BMI > 30). In addition, 69.7 % of the participants had multiple risk factors for CHD (Table 2 - next page).

Level of Perceived Risk and the Actual Risk

Table 3 provides data about the level of perceived risk among the participants at the pretest phase of the study. The results show that the mean score of total perceived risk was 49.7 out of 80.0, ranging from 33 to 71.

Table 4 shows data about the level of perceived risk among the participants at the posttest phase. Note that, 31 women from the original sample (N= 165) apologized for participating in the posttest phase. The results show that the mean score of total perceived risk was about 54.0 out of 80.0, ranging from 40 to 72(N = 134). Whereas, the mean score of total perceived

Characteristics	Subcategory	N(%)
Education Level	Illiterate	7 (4.2)
	Preparatory	6 (3.6)
	Elementary	64 (38.8)
	High school	46 (27.9)
	Diploma	32 (19.4)
	Baccalaureate	10 (6.1)
Household Income	Less than 200 JD per month	28 (17.0)
	200 JD to 399 JD per month	61 (37.0)
	400 JD to 599 JD per month	44 (26.7)
	600 JD per month or more	32 (19.4)
Marital Status	Single	14 (8.5)
	Married	131 (79.4)
	Widow	20 (12.1)
	Divorced	0 (0.0)

Table 1: Demographic Characteristics of the Sample (N = 165)

Risk Factor	Subcategory	N(%)
Smoking	Yes	48 (29.1)
	No	117 (70.9)
Family History of CHD		
	Yes	51 (30.9)
	No	114 (69.1)
History of DM		
	Yes	100 (60.6)
	No	65 (39.4)
History of HTN		
	Yes	84 (50.9)
	No	81 (49.1)
BMI		
	Normal: 18.5 to 24.9	50 (30.3)
	Overweight: 25 to 29.9	68 (41.2)
	Obese: ≥30	47 (28.5)
Two or more of risk factors	Two risks	49 (29.7)
	Three risks	40 (24.2)
	Four risks	25 (15.2)
	Five risks	1 (0.6)

Table 2: Risk Factors for CHD (N= 165)

Type of Risk	M (SD)	Median	Possible Range	Actual Range
Total PRHDS	49.7 (6.6)	50.0	20- 80	33- 71
Dread Risk	15.1 (5.1)	14.0	7- 28	7- 28
Risk	16.7 (2.6)	16.0	7- 24	11- 24
Unknown	17.9 (1.9)	18.0	7- 28	11- 25

Table 3: Mean, Median, and Standard Deviation of Perceived Risk at Pretest (N= 165)

Type of Risk	M (SD)	Median	Possible Range	Actual Range
Total PRHDS	54.0(6.1)	55.0	20- 80	40- 72
Dread Risk	17.6 (3.9)	17.0	7- 28	12- 28
Risk	18.1 (2.5)	18.0	7- 24	13- 24
Unknown	16.3 (1.7)	17.0	7- 28	10- 20

Table 4: Mean, Median, and Standard Deviation of Perceived Risk at Posttest (N= 134)

	Subcategory	Pretest Phase N (%)	Posttest Phase N (%)
Actual Risk	Low	0 (0.0)	44 (32.8)
	Medium	118 (88.1)	79 (59.0)
	High	16 (11.9)	11 (8.2)

Table 5: Percentages of Actual Risk (N= 134)

risk for the same group (N = 134) was 48.6 out of 80.0 at pretest phase.

Regarding the level of the actual risk among participants (Table 5), 32.8% of participants were at a low level of actual risk for CHD according to the WHO/ ISH prediction charts.

To evaluate the impact of intervention on the perception level, a Paired sample t test was conducted to estimate the difference in the mean score of the level of perceived risk for CHD from the pretest and posttest phases of the study. The results showed that there was a statistically significant increase in the perception for CHD between the pretest phase (M = 48.6, SD = 6.0) and the posttest phase (M = 54.0, SD = 6.1), t (133) = -23.543, P<.0001. Since, the mean increase was 5.4 with a 95% confidence interval ranging from 4.9 to 5.8, in addition, a Wilcoxon Signed Rank test was conducted to evaluate the difference in the level of actual risk among participants from the pretest and posttest phases of the study. The analysis revealed a statistically significant reduction in risk for CHD following participation in the program, Z = - 6.486, P<0.001.

A Kruskal-Wallis test was conducted to evaluate differences among the three types of interventions (diet only, diet and physical activity, and physical activity only) on median change in the level of actual risk for CHD. The test, which was corrected for tied ranks, was significant X2(2, N = 134) = 46.62, p< 0.001. The Mann-Whitney U test was conducted to evaluate pairwise differences among the three types of interventions, controlling for Type I error across tests by using the Bonferroni approach. The results of these tests indicated a significant difference in the level of actual risk between the group who implemented both interventions (diet and physical activity) and the group who only implemented the diet intervention (U= 441.5, p< 0.001). Also, there was a significant difference in the level of actual risk between the group who implemented both interventions (diet and physical activity) and the group who implemented the physical activity intervention (U= 302.5, p< 0.001). Therefore, implementing both interventions (diet and physical activity) elicited statistically lower level of actual risk than implementing only one type of intervention (p< 0.001). Note that, there was no statistically significance difference in the level of actual risk median between the group who implemented the diet intervention and the group who implemented the physical activity intervention (U= 922, p= 0.051).

Discussion

Perceived Risk of Heart disease

Several studies have found that a majority of women underestimated their risk of heart disease (Lefler, 2004; Mosca, et al., 2000; Mosca, et al., 2006, Ammouri, et al., 2010). This study supports the work of others in pointing out the lack of awareness among women about their susceptibility to this disease. In the view of this fact, the mean of total score of the PRHDS among women in this study was consistent with the mean of total score of the PRHDS among participants in a study conducted in Jordan by Ammouri, et al., (2010); of 43 out of 80 ranging from 20 to 57. In addition, the mean score of unknown subscale in this study was 17.9 out of 24 which corresponded with results reported by Ammouri, et al. (2010); of 14.4 out of 24. These results indicated that participants tend to downplay their risk of heart disease.

Intervention

The results of the effectiveness of combined diet and physical activity interventions that have been used in this study are analogous to the results of other studies. Muto and Yamauchi (2001) conducted a workplace health promotion program targeting diet and exercise to reduce CVD risk among 152 employees in which the intervention group spent four days at a resort for intensive lectures and training. The participants were assessed at baseline and at three month intervals for one year after the program. Those in the intervention group showed significant improvements in body mass index, and systolic blood pressure. Similarly, a 12 week employee wellness pilot program involving university employees (N = 50) focused on reducing risk factors for CHD through interventions aimed at improving diet and implementing a consistent exercise regimen (White and Jacques, 2007). The study's participants attended monthly workshops and had pre- and post-intervention measurements, which included weight, body composition, BP, TC, LDL-C, HDL-C, TC/HDL-C ratio, TG, and blood glucose (White and Jacques, 2007). A significant difference was observed between pre- and post-intervention measurements of weight (p = .01) (White and Jacques, 2007). However, statistically significant improvement was not seen in blood pressure. They also confirmed that only 25 of the original 50 participants remained (50%) at post-test, which potentially skewed the results of an already miniscule sample size (White and Jacques, 2007).

Limitations

One of the limitations of this study was the use of a convenience sample which may not be truly representative of women in Jordan. Although recruitment took place at several local hospitals, generalizability is limited due to geographic and nonrandom sample selection. Also, about 19% of participants did not complete the post test phase.

Recommendations

Recommendations for Future Research:

- Conduct additional studies to include women with less education, as well as women from different regions and age categories.
- Conduct additional studies that include practical training of the recommendations before starting the actual program.
- Conduct additional studies that include the WHO/ISH risk predictions charts with cholesterol.

- Conduct qualitative research to understand why women do not perceive themselves susceptible to heart disease and why they do not practice behaviors that could reduce their risk of developing heart disease and promote overall wellness.

Recommendations for Health Education Practice:

- There is a need for an increase in education regarding personal risk factors for heart disease and devising strategies to increase perceived susceptibility to the disease. It is imperative that nurses help resolve common misperceptions women have about heart disease and create increased awareness of the disease. Current awareness campaigns have achieved greater recognition of the impact of heart disease, but a gap in awareness continues to exist. This gap might be narrowed with more emphasis on social marketing through a media (i.e., television) available to the majority of the population.
- Exploration of the role of the physician recommending heart disease screening is needed. In an effort to increase screening behaviors of women, nurses can play a key role, acting as a resource for both physicians and the community. Nurses can help direct all women, whether they perceive themselves as susceptible or not, to appropriate screening tests for heart disease. Targeting younger women and those with lower education levels also is necessary to reach a population that's often under-represented in screenings.
- Health professionals, marketing experts, and non-profit organizations, such as the Jordan Nursing Council, need to collaborate to gain a better understanding of the priority population's beliefs about heart disease and motivation to participate in health-promoting behaviors to decrease risk factors for heart disease. Marketing campaigns can be developed to personalize the disease so women can relate to and understand their vulnerability to the condition.

Conclusion

Cardiovascular risk factors should be assessed in women starting much earlier than menopause and should then be treated as aggressively in women as in men. Few women appreciate that cardiovascular disease is their major health problem. So, any woman can benefit from increased awareness of her risks, and the younger women who adopt healthy lifestyle behaviors now may avoid developing heart disease later in life.

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MENOPAUSAL WOMEN'S SEXUAL FUNCTION AND RELATED FACTORS IN WEST OF TEHRAN

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Abstract

Background: A lot of progress has been made in prevention and treatment of menopausal problems but still sexual function, which may be influenced by several factors, need more attention. It is essential to identify these factors in this period.

Aim: To assess related factors of sexual functioning in postmenopausal women.

Materials and Methods: In this descriptive cross-sectional study, 163 volunteer healthy married postmenopausal women, who had been visited in selected health centers in west of Tehran, were enrolled. Data was collected by using demographics questionnaire and Sabbatsberg Sexual Rating Scale (SSRS). Data were analyzed by using independent t-test, ANOVA and Pearson correlation coefficient. This study was approved by the Ethics Committee of Tehran University of Medical Sciences (TUMS).

Results: The results showed that sexual function had a significant relationship with employment status, educational level, number of children, number of children at home, frequency of sexual intercourse per month and sexual satisfaction. On the other hand, sexual dysfunction had no significant relationship with women's age, husband's age, age of menopause, duration of marriage, number of children and economic status.

Conclusion: Sexual function in the postmenopausal period can be influenced by some social and personal characteristics. By understanding and knowing these characteristics, Health care providers could prepare suitable guiding and counseling for each target group for improving their sexual function and quality of life.

Key words: Sexual function; Menopause; Sabbatsberg Sexual Rating Scale (SSRS)

Background

According to the report by World Health Organization, menopause begins 12 months after spontaneous cessation of menstruation as a result of inactivity of ovaries, which is accompanied by hormonal, biological and clinical symptoms (1) and today due to health care improvement and increased life expectancy, women spend a considerable time in this period (1-4). According to Iran's yearbook of statistics in 2007, 13.87 Percent of women were 45 to 60 years old (5). Menopause symptoms can be classified into three categories of vasomotor symptoms such as hot flash and night sweat, central symptoms such as insomnia and changes in memory and concentration and genitourinary symptoms such as vaginal dryness, dyspareunia, urinary tract infections and urinary incontinence (6).

Although a lot of progress has been made in prevention and treatment of menopausal symptoms till the end of 20th Century, what seems to have received little attention in this regard was sexual function and its related problems (7), while sexual function constitutes an important part of women's health, sense of well-being (8-10) and affects their quality of life (9). Despite the great importance of healthy sexual function, many studies have indicated some problems in this regard (11). A cross-sectional study in the U.S. (2004) on women over 50 to 79 years old reported that prevalence of vaginal dryness and dyspareunia among the studied women was 27% and 5.2%, respectively. Also a study in six European countries (2008) of reduced sexual activity of 50-60 years old postmenopausal women, was reported in 34%, and showed effect of age on it (2). Beigi et al. (2009) reported frequency of sexual dysfunction during menopause period as 72.4% (12). The prevalence of these complaints increases with rising age (13). The main causes of sexual dysfunction in this period include physiological changes, psychological problems (14) and lack of sexual knowledge. These factors make the critical menopause period very risky because sexual disorders also mutually lead to reduced mental health of families through causing or exacerbating psychological problems (15). Regarding the Lopez study (2012), in a mid-aged Spanish sample, lower sexual function was related to menopausal and mood symptoms, several women and partner factors. Also they emphasized that further research is needed. (16) Regarding the Aida et al (2013) study, characteristics of the menopausal women that were statistically significant in those with sexual dysfunction were age, educational, race, and type of menopause. (17)

Considering the prevalence of sexual dysfunction in the menopause period and importance of maintaining sexual relations in this period, it is always important to have more study in this field (18). Since there was no documented study in the field of assessment of sexual function and related factors in menopausal women in Tehran, this study was carried out, to improve the health status of this vulnerable group of society.

Materials and Methods

In this cross-sectional study, which had been approved by the Research Ethics Committee of Tehran University of Medical Sciences (TUMS), and carried out in the selected health centers in west of Tehran, 163 volunteer healthy postmenopausal women aged 50-60 years old were involved during year 2011-2012. The subjects of the study were invited for a screening project of hypertension and diabetes. The subjects were recruited from the community through newspaper ads, flyers, and the internet, also their eligibility was assessed by using structured interview.

The inclusion criteria were age 50-60 years old, passing at least one year since menopause, not taking hormone replacement therapy, not having physical or mental diseases in women and their husbands, including diseases which affect sexual function, such as vasculitis, cardiovascular diseases, mental diseases, neurological disorders, thyroid problems and cancers, no taking drugs that affect sexual function such as anti cholinergic drugs, psychotropic, neurology drugs and hormones, no recent stresses such as unfaithful spouse, death, serious diseases or imprisonment of close friends and relatives in the past year, not separated from spouse during the interview, not suffering from premature ejaculation or impotence among their husbands, being illiterate and having at least one intercourse during previous month.

The assessment of the study included two main parts. In the first part personal characteristics, including age, time of last menstruation, number of coitus, number of children, number of children in home, education, occupation, and economic status of the volunteers, and spouse age. In the second part Sabbatsberg Sexual Rating Scale (SSRS), which is a valid and reliable questionnaire (19) and its Persian version has been previously used in various studies in Iran (20, 21), measure sexual function by assessing the domains of sexual desire, activity, satisfaction, arousal or pleasure, orgasm, and the importance of sex. Each domain have two items, therefore it has six for assessing different aspects of sexual function in the previous month, while the others assessed different aspects of sexual function in comparison to previous years. The response options were on a 5- point Likert scale rating system and the responses to each question were summed and converted to a percentage, producing a "sexual rating" between zero and 100.

After a detailed explanation of the procedure of study, written informed consent was obtained from the subjects, then, they filled out questionnaires of personal information and SSRS. Finally, the scores were calculated and analyzed by independent t-test, ANOVA and Pearson correlation coefficient (α was considered 0.05). All the statistical analyses were performed using SPSS16 software.

Results

The mean age of menopause in study subjects was 48.1± 4.1. Most of the participants (42.9%) were 50- 52 years old, and had one or two times of sexual intercourse per month (49.2%). The majority of women (41.4%) had a high school diploma, 69.9% were housewives and 65.1% had a moderate economic status. The mean age of their husbands was 59.41 ± 5.2. (Table 1)

Table 1: Personal characteristics:

Variables		N (%)
Occupation Status	Housewife	114 (70.2)
	Others	49 (29.8)
Education Status	Under diploma	72 (43.8)
	Diploma	51 (31.2)
	Academic	40 (25)
	Mean and SD	
Age	54.2 ± 3.3	
Menopause Age	47.3 ± 5.3	
Spouse' s age		47.3 ± 5.3
Duration of Marriage	33.03 ± 5.95	
Number of Children	3.6 ± 1.7	
Number of Children living with parents	1.63 ± 1.11	
Number of Coitus in the month	3.28 ± 2.56	

The relationship of the considered factors and sexual function was as follows: according to independent t-test, ANOVA and Pearson correlation, women's employment status ($p<0.01$), educational level ($p<0.001$), number of children ($p<0.02$), number of children at home ($p<0.03$), frequency of sexual intercourse per month ($p<0.001$) and their sexual satisfaction ($p<0.001$) had a significant relationship with sexual function (Tables 2 -3). According to the relationship between educational level and sexual function, the results of Scheffe test demonstrated Sexual function of those who had academic education was better than others ($p<0.02$). On the other hand, sexual dysfunction had no significant relationship with women's age, husband's age, menopause age, duration of marriage, number of children and economic status.

See Table 2: Variables, Sexual Function and Test Results - next page

Table 3: Number of coitus, Sexual satisfaction, Sexual Function and Test Results:

Variables	Pearson Correlations Results
Number of coitus in month	R = 0.46
	P < 0.001
Sexual satisfaction	R = 0.46
	P < 0.001

Table 2: Variables, Sexual Function and Test Results

Variables	Characteristics	The mean score of Sexual Function	Standard Deviation	Test Results
Age	50 - 55	28.6	15.7	P – value*= 0.94
	56 – 60	29	18.1	
Spouse' s age	50 - 55	35.7	16	P – value**= 0.17
	56 - 60	27.9	14.9	
	≥ 60	25.1	18.3	
Menopause Age	< 40	20.4	20.48	P – value**= 0.49
	40 - 50	29.8	17.4	
	≥ 50	28.7	16.4	
Duration of Marriage	20 - 30	33	14.5	P – value**= 0.17
	31 - 40	16	24.7	
	≥ 40	22.8	29.1	
Education Status	Under diploma	19.8	14.3	P-value**= 0.001
	Diploma	26.8	14.5	
	Academic	38.9	15.6	
Occupation Status	housewife	25.5	15.3	P-value*= 0.01
	Other	36.5	16.7	
Number of children	0 - 3	33.1	17.7	P – value*= 0.02
	≤4	23.1	12.7	
Number of children in the home	Exist	38.1	18.4	P – value*= 0.03
	absence	26.5	15.3	

Discussion

Sexual function is a complex combination of physical, mental and environmental factors (22). In this study in opposition of Castelo (2003) (23) and Beigi et al (2008) (12) there were no correlations between age and sexual function. Referring to correlation between Educational Level and Occupational status, with sexual function our result was similar to Beigi et al (12) and Denerestain et al(2003) (24) and referring to correlation between economical staus, our results were like Beigi et al, (12) and Gerber Et al. (25).

Conclusion

Sexual function in postmenopausal period can be influenced by some social and personal characteristics. By understanding and knowing these characteristics, Health care providers could prepare suitable guiding and counseling for each target group for improving their sexual function and quality of life.

The results of the present study indicated the effect of factors such as level of education, employment, number of children, number of children at home, frequency of sexual intercourse and sexual satisfaction on sexual function. Undoubtedly, having adequate sexual knowledge plays a key role in improvement of sexual function in such women. The effect of sexual knowledge was not studied in this paper, since women with an academic degree showed better sexual function. Hence, it can be recommended for the staff of health care centers to remind postmenopausal women about their development with age and reaching the time of menopause and the importance of sexual function in

their life. Thus, they should hold continuous training courses by qualified instructors and experts in order to improve sexual knowledge and health of these target groups for improving their quality of life.

Acknowledgements

The authors would like to thank the Research Chancellor of Tehran University of Medical Sciences for delivering financial support for process of this study. This study had been approved by Ethics Committee of Tehran University of Medical Sciences, also is the first phase of study, which had been registered in Iranian Registry of Clinical Trials, which is a Primary Registry in the WHO Registry Network set up with the help from the Ministry of Health and Medical Education (MOHME) of Iran. (Registry Number: N5 201010192172)

Authors would also like to thank Andrea Garratt for providing valuable information about SSRS.

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UNDERSTANDING OF CANCER RELATED PAIN: A CONTINUOUS EDUCATION REVIEW

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Abstract

Optimal pain management requires a systematic symptom assessment and appropriate management to promote quality of life. Inadequate management of pain is the result of various issues that include: under treatment by clinicians with insufficient knowledge of pain assessment and therapy; inappropriate concerns about opioid side effects and addiction; a tendency to give lower priority to symptom control than to disease management; patients under-reporting of pain and non-compliance with therapy. Thus, this paper will elaborate on all the above aspects, including the pathophysiology of pain, assessment and management of cancer pain; to understand the clinical approach used in managing cancer related pain. Cancer related pain remains the big problem now facing cancer patients, their family and oncology nurse specialists because of poor understanding, identification, assessment, and management. Despite the wide range of available pain management therapies, unfortunately, pain associated with cancer is frequently undertreated.

This paper may help nurses and post graduate oncology students in understanding the issue of cancer pain; in assessment, planning, and management of cancer related pain with consideration to all aspects of cancer pain in a comprehensive and systematic approach.

Key words: **cancer, cancer pain, pathology of pain, pain assessment, pain management, pain barriers, and nursing process.**

Introduction and Background

The International Association for the Study of Pain defines pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Pain is the most frightening symptom that is found in cancer patients and represents the most feared consequences for patients and their families (Cleeland, 2006).

Cancer related pain depends on type of cancer, stage of disease, type of treatment received and location of cancer (Laurie, 2012). Also, cancer patients experience multiple symptoms with pain; therefore, optimal pain management requires a systematic symptom assessment and appropriate management to promote quality of life (Meuser, Pietruck, Radbruch, et al. 2001).Inadequate management of pain is the result of various issues that include: under treatment by clinicians with insufficient knowledge of pain assessment and therapy; inappropriate concerns about opioid side effects and addiction; a tendency to give lower priority to symptom control than to disease management; patients under-reporting of pain and non-compliance with therapy (Portenoy & Lesage, 2002).Understanding all aspects of disease process, type of cancer, stage of cancer, effects of other treatments, and symptoms associated may help the nurses to overcome this issue (Portenoy & Lesage, 2002). Thus, this clinical log will elaborate on all the above aspects, including the pathophysiology of pain, assessment and management of cancer pain; to understand the clinical approach used in managing cancer related pain.

Cancer related pain remains the big problem now facing cancer patients, their family and oncology nurse specialists because of poor

understanding, identification, assessment, and management (Winslow, Seymour, & Clark, 2005). Despite the wide range of available pain management therapies, unfortunately, pain associated with cancer is frequently undertreated (Weiss, Emanuel, Fairclough, et al. 2001).

This paper may help nurses and post graduate oncology students in understanding the issue of cancer pain; in planning, assessment, and management of cancer related pain with consideration to all aspects of cancer pain in a comprehensive and systematic approach.

Moreover, it may help in raising some recommendations to stakeholders and administrative staff, which may help them in reshaping policies and guidelines related to cancer pain assessment and management in order to enhance the patient's quality of life. Thus, the purpose of this paper is review and it analyzes recent research articles that have studied cancer-related pain in order to understand the factors that affect cancer-related pain and to promote quality of life among cancer patients.

Theory Application

A multidimensional model of cancer pain includes five dimensions: physiologic (organic etiology of pain); sensory) intensity, location, quality); affective (depression, anxiety); cognitive (influences of pain on thought process, meaning of pain); and behavioral (behaviors used to express and/or control pain). McGuire (1987) confirmed these five dimensions and added a sixth dimension named a socio-cultural dimension; these dimensions will be used to better understand cancer pain. A multidimensional framework has implications for assessment and management of cancer pain. Thus, any clinical assessment must address relevant dimensions of pain. (Ahles, Blanchard, & Ruchdeschel, 1983)

Pain Experience among Cancer Patients

Cancer-related pain is still uncontrolled worldwide and has a significant spread. This review aimed to explore pain experience among cancer patients and to identify the relationship between the multidimensional aspects of cancer-related pain that need to be managed from a holistic perspective.

Despite advances in pain management, research studies confirmed inadequate pain management due to many factors such as poor assessment of pain by nurses and health care providers and not considering all dimensions of pain experience when planning for pain management (Alexopoulos, 2010).

A review of the available clinical literature regarding the experience of pain among cancer patients pointed to several factors such as cancer stage, bone metastasis, location of pain, and compliance to analgesic treatment, type of treatment, patient's beliefs about pain and the effects of personal characteristics. Also, the review focused on the interference of pain dimensions and their relatedness.

The physiologic dimension of the cancer-related pain experience involves the etiology of pain (i.e., bone metastases), the duration of the pain (i.e., acute or chronic), and the pattern of the pain (i.e., brief, momentary or transient, continuous, steady or constant) (McGuire, 1995).

The occurrence of pain may be associated with the patient's stage of disease (Stark, et al. 2012; Cohen, et al. 2005). Three of the 14 research studies on cancer pain described the physiological experience of pain. The studies that included some physiological variables (i.e., disease process, stage of disease, duration and pattern of pain) found that a large percentage of patients reported pain experience was the most distressing problem that was related to disease process, stage of cancer and metastases pattern. Pain was described as moderate to severe level on a numeric pain scale where 0 indicates no pain and 10 indicates worst pain.

Alexopulos, et al. (2010) used a descriptive cross-sectional design to describe the pain experience among 134 patients in advanced stage of cancer disease. Patients who were included in the study suffered from various malignancies. Most frequent malignancies were lung (35), and breast (25) cancers. Patients were given 35 item questionnaires to assess their response to pain and its influence with function and their compliance to analgesic treatment. Numeric pain scale was used to assess the intensity of pain. The result indicated that more than 70% perceived the intensity of pain as high or extremely high (scores 3 and 4), whereas 28% of the patients described the intensity of pain as moderate and low. Pain was predominantly located in the low back and spine (30%), followed by the abdominal (19%) and thoracic area (18%), lower extremities (11%) and pelvis (10%).

Also, the result indicated that pain influences the patient's physical and psychological functioning. Regarding compliance to analgesic treatments, non-compliance was observed in 15% of the patients, while 61% revealed negative attitudes and feelings toward the treatment; including the fear of side effects and fear of addiction. One important finding was 25% of patients reported not being informed about possible side effects of the analgesic treatment.

The findings from the above reviewed study confirmed that there is a relationship between sensory dimension (intensity of pain) and the physiological dimension such as stage of disease, duration and pattern of pain. Thus, nurses should consider this interrelatedness between these dimensions in planning for pain management and to consider education about analgesics and side effects to enhance compliance to treatment regimen.

The sensory dimension of cancer-related pain experience is composed of many variables such as intensity and location of pain. Two reviewed studies examined the pain intensity and its relation with other dimensions.

Vallerand, et al. (2007) conducted a cross-sectional study to examine the relationship between the sensory dimension (pain level) and patient's beliefs about pain. The researchers recruited 304 cancer patients, and identified two indicators to define the patient's beliefs regarding pain: knowledge of pain, and barriers to pain control. The researcher found that the patient's pain level was positively related to increased distress, and decreased perceived control over pain. It also confirmed a relation between pain level and functional status, and a direct effect between patient's beliefs of pain and the level of pain distress. Therefore, controlling the factors affecting pain level (perceived control, beliefs) may help in promoting quality of life.

These findings raised the importance of understanding patient's beliefs and the psychological aspect (patient's moods and anxiety level) in order to consider these aspects while planning for pain management.

The behavioral dimension of the cancer pain experience involves the patient's behaviors during pain to decrease pain or to indicate the presence of pain. Often these behaviors will increase as pain severity increases and will decrease as pain lessens. Three reviewed studies reported on the pain behaviors of patients with cancer.

Ngamkham, Janean, Holden, Diana, & Wilkie (2011) conducted a comparative, secondary data analysis. The researchers' recruited 762 outpatients with cancer who completed the numeric intensity pain scale (0-10) and the McGill pain questionnaire to measure pain location, quality and pattern. The researcher found that participants with continuous uncontrolled pain patterns reported behavioral effect on activity of daily living, communication, movement, fatigue, and emotion increased pain intensity whereas only movement increased pain intensity for participants with intermittent pain pattern. Similarly, Alexopoulos, et al. (2010) identified the location of pain and its relation with physical and psychological function. The pain location was reported to influence the patient's physical and psychological functioning. Specifically, 25% of the patients stated reduced physical activity, 12% loss of autonomy, 32% reported fatigue and generalized weakness, and 10% reported sleep disorders and 7% stated they would even prefer to die.

This finding reflects the effects of sensory and physical dimensions (pattern of pain, location of pain) on the behavioral and psychological dimensions of cancer pain that affect activity and ability to function. Thus, nurses need to consider these variables while assessing pain for appropriate management.

The socio-cultural dimension of the cancer pain experience is related to the demographic and ethnic characteristics associated with pain (e.g., age, gender, ethnicity, social support, and religious beliefs) as well as how pain affects personal, family, and social roles (McGuire, 1995). Four reviewed studies discussed the socio-cultural dimension. Culturally defined roles (e.g., gender roles) are important in the perceived meaning of cancer and its pain.

Meghani & Keane (2007) conducted a qualitative descriptive study to explore the preference of analgesic treatment for cancer pain among African Americans and the factors shaping these preferences. The researcher recruited 35 cancer patients from three outpatient oncology clinics. The data was gathered using demographics, the Brief Pain Inventory-Long Form, and in-depth semi structured interviews. The researcher reported that only 20% of the participants strongly believed in taking pain medications to decrease their pain, because they believed that attaining optimal pain relief was central to their sense of self-control and that pain medication helped them to communicate with others. The preference for analgesics for cancer pain was related to factors such as meaning of cancer pain treatment, past experience with pain relief and analgesic side effects, fears of dependency and tolerance, and past experience with providers and the health system.

Similarly, Im, Clark, & Chee, (2008) conducted a qualitative online forum designed from a feminist perspective and recruited 11 African American cancer patients who were recruited through both Internet and real settings. Nine online forum topics were used to administer the six-month online forum, and the data were analyzed using thematic analysis. Four themes emerged through the data analysis process. The researchers found that the participants look for pain as a challenge in life that they should fight against and differentiated it from ordinary pain because cancer was stigmatized in their culture. In addition, patients held varying beliefs about pain and pain treatments in particular; 41% of participants held strong beliefs about the potential for addiction to narcotics.

Furthermore, Cohen, et al. (2008) reported that patients, who have strong beliefs about the potential for addiction to narcotics, may influence their pain management. Effective pain management in the inpatient oncology setting continues to be an important clinical issue; there may be a significant relation between patients' beliefs about pain and pain management and the pain management they receive.

Assessment Tools

Poor assessments of cancer pain lead to ineffective control and management; assessment of pain should be evaluated at each clinical encounter and at regular intervals after initiation of pharmacologic or non-pharmacologic intervention.

Identifying the etiology of pain is important to its management and a multidimensional assessment of pain should be incorporated (Chung, Wong, Yang, 2000).

The goal of pain assessment is to identify the pathophysiology of the pain, intensity of the pain and its impact on the patient's ability to function.

For example, a study was done by Mystakidou, Tsilika, Parpa, et al. (2006) to evaluate the association between psychological distresses and pain with advanced cancer. Pain intensity and pain that affected walking ability, normal work, and relations with other people, as measured by the Brief Pain Inventory, were found to be significant predictors of anxiety, as measured by the Hospital Anxiety and Depression Scale. Using the same tools, the authors also found pain that interfered with enjoyment of life was a predictor of depression. There are many factors may play an important role in the response to analgesics and result in persistent pain such as changing nociception due to disease progression, intractable side effects, tolerance, neuropathic pain, and opioid metabolites (Mercadante & Portenoy, 2001).

Multiple pain assessment tools exist. Among the more commonly used tools are numeric rating scales, verbal rating scales, visual analog scales, and picture scales, but, still the main step of pain assessment is the patient self-report (Holen, Hjermstad, Loge, et al. 2006). The clinician should listen to the patient's descriptive words about the quality of the pain; these provide clues to its etiology. Moreover, the clinician should ask about the location of pain, radiation, changes in pattern; these may require a new diagnostic re-evaluation and modification of the treatment plan. In addition, exploring the cognitive aspects of pain may help in determining the degree of pain experience.

The Brief Pain Inventory (BPI) was developed from the Wisconsin Brief Pain Questionnaire (Daut, Cleeland, and Flanery, 1983). The BPI assesses pain severity and the degree of interference with function, using 0-10 NRS. It can be self-administered, given in a clinical interview, or even administered over the telephone. Most patients can complete the short version of the BPI in 2 or 3 minutes. Chronic pain usually varies throughout the day and night, and therefore the BPI asks the patient to rate their present pain intensity, pain now, and pain at its worst, least, and average over the last 24 hours. Location of pain on a body chart and characteristics of the pain are documented.

The BPI also asks the patient to rate how much pain interferes with seven aspects of life: (1) general activity, (2) walking, (3) normal work, (4) relations with other people, (5) mood, (6) sleep, and (7) enjoyment of life. The BPI asks the patient to rate the relief they feel from the current pain treatment (Wang & Cleeland, 2008).

Physical Examination

Physical examination should be done to determine the origin, characteristics, and intensity of pain. Altered sensation at the painful area may suggest neuropathic pain. All data collected during history taking and physical examination may help in diagnosis of pain with respect to etiology if the pain from the disease process or from the adverse effects of treatment such as chemotherapy or radiotherapy. Also, understanding pathophysiology may help in identifying if it is somatic, visceral, or neuropathic pain. Thus, comprehensive physical examination and assessment of other psychosocial and spiritual factors is very important in generating a comprehensive care plan for cancer pain management.

Diagnostic Procedure

To understand the cause of cancer pain the patients need to have various laboratory tests, X-rays, Computed Tomography (CT) scans, Magnetic Resonance Imaging (MRI) scans, Positron Emission Tomography (PET) scans or biopsies. Sometimes it can take weeks or months before the growth of a tumor shows up in an X-ray, for example, even though a patient has been complaining of pain all along. Every case is different, and depending on the type and stage of cancer, the appropriate diagnostic tests vary. After the pain is diagnosed and treatment initiated, it is essential to follow up specifically if the pain worsens or if there is any new pain. In this case, either the treatment will change and may need reassessment for another cause of the pain. The CT scan produces detailed, cross-sectional images of the body.

CT scans are helpful in staging cancer. They help in identifying if cancer metastasises to other organs. PET scans use glucose (a form of sugar) that contains a radioactive atom.

A special camera can detect the radioactivity. Cancer cells absorb a lot of the radioactive sugar because of their high rate of metabolism. PET is useful to look for cancer throughout the body.

Pathophysiology of Cancer Related Pain

Pain is sustained by different types of mechanisms. There is agreement among experts about the classification of pain into nociceptive, neuropathic, psychogenic, mixed, or idiopathic. This classification is found useful in assessment and therapeutic decision making.

Mechanisms of Nociceptive Pain

According to Willis (2007) nociceptive pain occurs as a result of the normal activation of the sensory system by noxious stimuli, a process that involves transduction, transmission, modulation and perception. Tissue injury activates afferent neurons (nociceptors) which have A-delta and C-fibers that respond to noxious stimuli and

are found in skin, muscle, joints and some visceral tissues. These fibers have specific receptors responsible for mechanical, chemical or thermal stimuli. Transduction is the process by which exposure to a sufficient stimulus produces depolarization of the peripheral nerve. Depolarization of the primary afferent nerve involves a complex neurochemistry, in which substances produced by tissues, inflammatory cells and the neuron itself influence transduction. Once depolarization occurs, transmission of information proceeds proximally along the axon to the spinal cord and then on to higher centers (Schaible, 2007; Stein, et al. 2009). The transmission of these neural signals is from the site of transduction (periphery) to the spinal cord and brain (Apkarian, Bushnell, Treede, & Zubieta, 2005).

The neurochemistry of these processes involves many compounds, including endorphins, neurokinins, prostaglandins, biogenic amines, GABA, neurotensin, cannabinoids, purines, and many others. The endorphinergic pain modulatory pathways are characterized by multiple endogenous ligands and different types of opioid receptors: mu, delta, and kappa. Endorphins are present in the periphery, on nerve endings, immune related cells and other tissues, and are widely distributed in the central nervous system (CNS). They are involved in many neuro-regulatory processes apart from pain control, including the stress response and motor control systems.

Opioid drugs mimic the action of endogenous opioid ligands. Most of the drugs used for pain are full mu receptor agonists. Other pain modulating systems, such as those that use monoamines (serotonin, norepinephrine and dopamine), histamine, acetylcholine, cannabinoids, growth factors and other compounds are targets for non-traditional analgesics, such as specific antidepressants and anticonvulsants (Apkarian, Bushnell, Treede, & Zubieta, 2005).

Nociceptive pain can be acute (short-lived) or chronic (long-lived), and may primarily involve injury to somatic or visceral tissues. Pain that is inferred to be related to ongoing activation of nociceptors that innervate somatic structures, such as bone, joint, muscle and connective tissues, is termed “somatic pain”. This pain is recognized by identification of lesion and characteristics that typically include a well localized site and an experience described as aching, squeezing, stabbing, or throbbing. Arthritis and metastatic bone pain are examples of somatic pain.

Pain arising from stimulation of afferent receptors in the viscera is referred to as visceral pain. Visceral pain is caused by obstruction of hollow viscous, is poorly localized and is often described as cramping and gnawing, with a daily pattern of varying intensity. When organ capsules or other structures such as myocardium, are involved however, the pain usually is well localized and described as sharp, stabbing or throbbing; descriptors similar to those associated with somatic pain (Apkarian, Bushnell, Treede, & Zubieta, 2005).

The neurogenic inflammation involves the release from nerve endings of compounds such as substance P, serotonin, histamine, acetylcholine, and bradykinin. These substances activate and sensitize other nociceptors. Prostaglandins produced by injured tissues also may enhance the nociceptive response to inflammation by lowering the threshold to noxious stimulation (Apkarian, Bushnell, Treede, & Zubieta, 2005).

Mechanisms of Neuropathic Pain

Neuropathic pain is due to direct injury or dysfunction of the peripheral or central nervous system. These changes may be caused by injury to either neural or non-neural tissues (Jarvis & Boyce-Rustay, 2009). The neuropathic pain is described as an uncomfortable sensation such as burning, shock-like or tingling (Truini & Cruccu, 2006). Injury to a peripheral nerve axon can result in abnormal nerve morphology. The damaged axon may grow multiple nerve sprouts, some of which form neuromas. The sensory nerve sprouts, including those forming neuromas, can generate spontaneous activity, which peaks in intensity several weeks after injury. These areas of increased sensitivity are associated with a change in sodium receptor concentration, and other molecular processes, and also can occur at sites of demyelination or nerve fiber injury not associated with the severing of axons (Jarvis & Boyce-Rustay, 2009). Some alterations in morphology and function result in peripheral sensitization, which may be related to a lower threshold for signaling or an expansion in receptive fields .In contrast to the still poor understanding of the mechanisms of peripherally generated neuropathic pain, there is almost no information about the processes that induce or sustain centrally generated pain syndromes. Function neuroimaging has demonstrated the extraordinary neuroplasticity of the brain in the setting of a neuropathic pain, such as phantom pain, but the mechanisms responsible are unknown (Bingel & Tracey, 2008).

Mechanisms of Psychological and Idiopathic Pain

The experience of persistent pain appears to induce disturbances in mood (reactive depression or anxiety), and impaired coping, which in turn, appears to worsen pain. This phenomenon is known generically as “psychogenic” pain and is subject to the specific diagnoses coded under the Somatoform Disorders in the Diagnostic and Statistical Manual of the American Psychiatric Association (American Psychiatric Association, 2000). It is very important that patients who have acute or persistent pain without a known physical source, not be inappropriately labeled. This may lead to inadequate assessment in the future and therapeutic decisions that are inappropriately skewed; unfortunately it also leads to stigmatization of the patient and

the potential for greater suffering. When reasonable inferences about the sustaining pathophysiology of a pain syndrome cannot be made, and there is no positive evidence that the etiology is psychiatric, it is best to label the pain as idiopathic.

Breakthrough pain, defined as transient exacerbation of pain after baseline pain, has been reduced to a mild or moderate level by treatment with opioids and occurs in about 63% of cancer patients. It has a rapid onset and a variable duration with an average of approximately half an hour. The presence of breakthrough pain is a marker of a generally more severe pain syndrome and is associated with both pain-related functional impairment and psychological distress.

Pain Management Strategies

There are two approaches used in cancer pain management; pharmacological approach and non- pharmacological approach. Prescribed pain medications are categorized as non-opioid, opioid and adjuvant pain medications. Non-opioid medications include acetaminophen and non-steroidal anti-inflammatory (NSAID) medications such as ibuprofen or naproxen sodium and are useful for mild to moderate pain and in conjunction with opioid medications for more intense pain (American Pain Society, 2005). The mechanism of action for acetaminophen is still unknown, but it is postulated that it has a central nervous system mechanism, because of its pain and fever reducing effects (Schug, 2005). In comparison, the mechanism of action of NSAIDs is well known. NSAIDs inhibit cyclooxygenase, an enzyme that catalyzes the production of prostaglandins, which are key instigators of the inflammatory process (American Pain Society, 2005). Because of this mechanism, NSAIDs are especially useful in treating inflammatory pain, as they prevent the very process that causes it (Samad, 2004).

Opioid pain medications are the medications most frequently used for moderate to severe pain because of their effectiveness, ease of titration, and favorable risk-to-benefit ratio (American Pain Society, 2005). Opioid medications include morphine, hydromorphone, methadone, codeine, oxycodone, hydrocodone, levorphanol, and fentanyl (American Pain Society, 2005). Opioid pain medications may be a combination of narcotic pain medications and acetaminophen or non-steroidal anti-inflammatory medications. Opioid medications act on opioid receptors which are found both peripherally and centrally in nerve tissue, in gastrointestinal, respiratory, and cardiovascular organs, and the bladder (Lipman & Gautier, 1997). One particularly opioid receptor-rich area in the central nervous system is the periaqueductal gray, which is a key area in the modulation or control of pain (Heinricher, 2005). When an opioid binds to the opioid receptor, an excitatory or inhibitory response occurs, which inhibits the transmission of pain impulses in the brain and spinal cord (Sweeney & Bruera, 2003).

The term adjuvant analgesics describes "…a non-opioid medication that has pain relieving effects in certain conditions, but whose primary or initial indication was not for the treatment of pain" (American Pain Society, 2005, p. 73). Medications that have been used as adjuvant pain medications include anticonvulsants and antidepressants (American Pain Society, 2005). Adjuvant medications diminish pain by altering nerve function. Anticonvulsants, such as phenytoin and carbamazepine work by blockading the sodium channels and stabilizing the nerve membrane (Kalso, 2005). Antidepressants, such as amitriptyline, increase the availability of neurotransmitters, block sodium channels, and block receptors (Kalso, 2005). When sodium channels are blocked the nerve depolarization and stimulation will be affected, and nerve hyper-excitability is diminished (Kalso, 2005).

The type of pain medication prescribed (i.e. non-opioid, opioid, adjuvant) is an important indicator of pain management quality as pain management guidelines recommend specific types of medication in response to different reports of pain (American Pain Society, 2005; NCCN, 2006; NCI, 2006). There are five essential concepts of the World Health Organization approach to drug therapy which are (1) oral administration, (2) by-the-clock, (3) by the ladder, (4) for the individual, and (5) with attention to detail. The drug is chosen to match the intensity of pain. A validation study of the World Health Organization Analgesic Ladder suggests that a direct move to the third step of the ladder is feasible and could reduce some pain scores but also requires careful management of side effects (Maltoni, et al 2005). Use of this approach enables management of 80% of cancer pain.

Radiation therapy can relieve pain associated with local extensions of cancer, as well as metastases. Pain due to peripheral nerve compression or infiltration by tumor may sometimes be relieved by radiation therapy. Radiation therapy may be simply palliative for relief of bone pain.

Non-pharmacological approaches

Non-pharmacological approaches such as Acupuncture, hypnosis, and biofeedback have been used for the relief of cancer pain and are useful in some cases. No adequately controlled studies have shown their effectiveness in cancer pain, but many ambulatory patients use these methods without the knowledge of their attending physicians. A systematic review of controlled clinical trials reveals that there is insufficient evidence to determine whether acupuncture is effective in treating cancer pain in adults (Paley, et al. 2011).

Drug delivery devices

Various drug delivery methods have been used to deliver opioid analgesics to the central nervous

system in cancer patients. For example, intrathecal by a programmable drug pump and catheter that are surgically placed underneath the skin of the abdomen. Because the medication is delivered directly to the pain pathway, small doses can be effective with intrathecal infusion. Site-specific drug delivery may also help to minimize side effects and limit addiction potential. Intrathecal drug delivery systems, which offer rapid and effective pain relief with less toxicity relative to oral or parenteral administration, are considered to be highly effective in a variety of settings (Stearns, et al. 2005).

Anesthetic Drugs

Various regional nerve blocks using local anesthetics can be used for pain relief. Local anesthetics and neurolytic agents can be delivered directly to the vicinity of the neural structures affected by tumor. Nerve blocks may be done as diagnostic procedures to predict the outcome of more permanent interventions such as neurolysis or rhizotomy.

Celiac plexus block for pancreatic cancer pain in adults can be performed by the percutaneous approach or guided by endoscopic ultrasonography. Although statistical evidence for the superiority of pain relief by celiac plexus block over analgesic therapy is minimal in a systematic review of clinical trials, it causes fewer adverse effects than opioids, which is important for patients (Arcidiacono, et al. 2011).

Neurolytic blocks of the sympathetic axis are considered important cost-effective adjuncts to pharmacologic therapy for the relief of severe visceral pain experienced by cancer patients. However, these blocks rarely eliminate cancer pain because of frequently coexisting somatic and neuropathic pain.

Surgical Methods of Cancer Pain Management

These methods are used in about 10% to 30% of cancer patients in whom other methods of pain control have failed. The aim is to reduce side effects of analgesic therapy and to improve the patient's quality of life. Surgical methods range from procedures to debulk tumors and decompress various pain sensitive structures to interrupting pain pathways. An example of some of these procedures includes spinal decompression and the insertion of a rod to stabilize the spine for bone pain due to metastatic involvement of the spine. Another example includes neuroablative procedures, such as dorsal rhizotomy, spinothalamictractotomy, and commissural myelotomy.

Spinal cord stimulation has been used successfully for treatment of intractable cancer pain. Spinal cord stimulation through implanted electrodes in a patient with intractable neuropathic pain due to metastatic cancer has been shown to provide 90% to 100% pain relief and discontinuation of pain medications for 1 year (Yakovlev & Ellias 2008).

Rehabilitation of the Patients with Cancer Pain

Adequate pain management is a requisite condition for successful rehabilitation of patients with cancer. Opioid pharmacotherapy, adjuvant drugs, disease-modifying therapies, and interventional strategies may be used concurrently to augment pain relief.

The current management of pain in cancer patients is inadequate and requires further research. Problems with management of cancer pain that need to be addressed include use of inadequate doses of opioids and poor management of opioid side effects (Jacobsen et al 2007). There is also a need to develop better dosing strategies and evidence-based recommendations for severe cancer pain. Currently, opioid dose titration for severe pain is guided by the experience and opinion of an individual expert. Evidence-based guidelines for the use of opioid analgesics in the treatment of cancer pain are being developed in Europe (Pigni, et al. 2010).

Evidence-based standards for cancer pain management have been described (Dy, et al. 2008). According to the recommendations, when spinal cord compression is suspected, providers should treat with corticosteroids and evaluate with whole-spine magnetic resonance imaging scan as soon as possible but within 24 hours to make further decisions for definitive treatment. With increasing length of survival of cancer patients, cancer pain is moving into the category of chronic pain and provides more challenges in management (Burton, et al. 2007). Although opioids are capable of controlling moderate and severe cancer pain, their adverse effects remain a cause for concern. Efforts to address this problem include the following (Plante & VanItallie, 2010). Neuro-stimulatory or neuro-inhibitive methods are being investigated to reduce the dose by amplifying the analgesic action of opioids. Search continues for endogenous opioids that are as effective as currently available opioids but without their adverse effects. Advances during the past decade suggest a future trend towards a targeted as well as an individualized plan of management of cancer pain that is appropriate throughout the course of illness (Portenoy, 2011).

Barriers to Effective Cancer Pain Management

Barriers to effective cancer pain management are still a permanent, feared, and prevalent problem throughout the world (Bagciva, Tosun, Komurcu, Akbayrak, and Ozet, 2009). Cancer related pain is prevalent in many types of cancer including 67-91% in the head and neck region, 56-94% in prostate, 30-90% in uterine, 58-90% in genitourinary and 40-89% in breast cancer (Valeberg, Rustoen, Bjordal, Hanestad, Paul, and Miaskowski, 2008.

There are many factors which contribute to ineffective pain management of cancer patients; they include barriers within systems of care, health care professionals, and

among patients and their families (Finley, Forgeron, & Arnaout, 2008).

Many researchers reported that patients are reluctant to report their pain for different reasons which include fear of side effects, fatalism about the possibility of achieving pain control, fear of distracting physicians from treating cancer, tolerance, addiction and belief that pain is indicative of a progressive disease (Potter, et al. 2003; Miaskowski, & Dibble, 1995; Finley, Forgeron, & Arnaout, 2008). Also, these factors cause a worse effect for all dimensions of a patient's quality of life and their families (National Institutes of Health, 2002). Major obstacles to patients reporting pain and using available analgesics include misconceptions regarding beliefs about disease and pain, and pain medication (Dawson et al., 2002; Gunnarsdottir, Donovan, Serlin, Voge, & Ward, 2002; Jacobsen et al., 2012).

To enhance the quality of cancer pain management, it is very important to better understand the phenomenon of patient-related barriers to cancer pain management. Also, investigating the patient-related barriers to cancer pain management will help to fill the gaps in knowledge related to patients' barriers and consequently enhance the quality of cancer pain management. Multiple factors associated with ineffective cancer pain management such as cultural factors, misperception about pain medication (fear of side effects, fear of addiction, and tolerance), patient's demographic characteristics and patient's beliefs such as fatalism which increases the suffering and reduced quality of life for patients and their families.

Many barriers to effective cancer pain management have been reported in order to establish clear guidelines and an educational program to overcome these barriers, to relief pain and suffering among cancer patients.

Summary and Conclusions

By understanding the factors that are involved in the dimensions of cancer-related pain from the patient's experience, nurses can better prevent problems and consequences of cancer related pain that lead to inadequate management of pain. Thus, understanding the experience of cancer related pain with consideration to sources, etiology of cancer pain, response to analgesic agents, and cultural beliefs should be a primary concern for nurses caring for patients with pain.

Nurses need to become sensitive to all aspects of experience of cancer related pain, and to pay particular attention to what happens when different aspects come together. Appropriate awareness and sensitivity to cultural influences is important in preventing discrepancies in pain assessment and management.

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THE RELATIONSHIP BETWEEN TYPE 2 DIABETES AND CANCER: AN INTEGRATIVE REVIEW

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Abstract

Background: There is evidence to suggest that type 2 diabetes may increase the risk of incidence of cancer. Type 2 diabetes is characterized by insulin resistance and hyperinsulinemia. Hyperinsulinemia may lead to cancer through insulin's effect on its cognate receptor and the insulin-like growth factor system.

Methods: An integrative review of the literature focused on 9 articles 2009-2013, and was completed to determine the Relationship between Type 2 Diabetes and Cancer.

Conclusions: Substantial evidence suggests that people with type 2 diabetes have an increased risk of developing several types of cancers.

Key words: diabetes mellitus, cancer, diabetes type 2, epidemiology, incidence, relationship, diagnosis, risk factor

Introduction

Diabetes mellitus (DM) is a serious growing health problem worldwide and is associated with severe acute and chronic complications that negatively influence both the quality of life and survival of affected individuals (Vigneri P, Frasca F,Sciacca L, Pandini G, vigneri R, 2011). Globally, as of 2010, an estimated 285 million people had diabetes with type 2 making up about 90% of the cases. Its incidence is increasing rapidly and by 2030, this number is estimated to almost double (Wild S, Roglic G, Green A, Sicree R, King H, 2004). Therefore, if diabetes is associated with a small increase in the risk of cancer, this may have important consequence at the population level (Vigneri et al., 2011). So Diabetes and cancer are common diseases that have a tremendous impact on health worldwide. The epidemiological evidence suggests that people with diabetes are at a significantly higher risk of many forms of cancer as type 2 diabetes and cancer shares many risk factors (Giovannucci et al., 2010). However, the links between diabetes and cancer are still not well understood. Moreover, evidence from observational studies suggests that some medications used to treat hyperglycemia are associated with either an increased or reduced risk of cancer (Giovannucci et al., 2010). Moreover, some but not all epidemiologic studies have suggested that diabetes significantly increases mortality in patients with cancer (Chustecka, 2010).

In this review, we will assess the available evidence about the association between type 2 diabetes mellitus and cancer, the different aspect of diabetes type 2 which may influence this association and the possible mechanisms involved.

Methodological Characteristics

The 9 studies composing this integrative research review were quantitative studies. Four studies were review studies, two studies were meta analysis studies, two studies were cohort studies and one was a case control study. Although only 9 studies were included in this research review, a wide variety of instruments were used to measure concepts related to the relationship between Type 2 Diabetes and Cancer. Most instruments were used in these studies to collect information to measure the effect of type 2 diabetes mellitus on development of cancer by review, review and analysis or comparing populations. The samples in articles are composed of males and females with type 2 diabetes mellitus and the age of samples varied. Many types of cancer were included in this review such as colorectal cancer, prostate cancer, and primary liver cancer.

Design

An integrative review method was used which encompasses a diverse form of research studies, including experiment and non-experimental ones to understand the phenomenon of interest (Whittemore & Knafl, 2005). Integrative review may also

combine data from theoretical as well as empirical literature. In addition, integrative review incorporates a wide range of purposes: to define concepts, to review theories, to review evidence, and to analyse methodological issues of a particular topic (Broome, 1993). Cooper (1998) delineates five stages of research review: problem identification, data collection, data evaluation, analysis and interpretation, and presentation of findings.

Search strategy

A literature search was conducted through the major electronic database MEDLINE. Articles reviewed were limited to primary research reports and published in English from 2009 to 2013. One hundred and forty one articles were identified through the database search and review of reference lists, of which some articles were duplicated. Also some articles were excluded because they were not related to diabetes and cancer or they were not empirical studies but were discussions, opinions or editorial articles. Eventually, only 9 articles were included in this review.

Keywords used in literature search were: diabetes mellitus, cancer, diabetes type 2, epidemiology, incidence, relationship, diagnosis, risk factor

Data extraction and synthesis

Each of the 9 studies was analysed and categorized according to the types of methodology used. The following characteristics (Table pages 33-34) were recorded: purpose of the study, study design, population and outcomes of the findings.

Authors	Purpose	Population	Findings	Method
Neale ,Doecke , Pandeya, Sadeghi, Green Webb , Whiteman.	Does type 2 diabetes influence the risk of oesophageal adenocarcinoma?	Compared type 2 diabetes prevalence among oesophageal adenocarcinoma patients and population controls.	Diabetes increased the risk of OAC	Case control study
Berster, Göke.	Colorectal cancer occurs more frequently in patients with type 2 diabetes mellitus	Colorectal cancer in patients with type 2 diabetes mellitus	Increased risk for colorectal cancer	Review
Krämer, Schöttker Raum, Brenner.	T2DM is associated with a moderate increase in CRC risk in both men and women.	Total of 29 eligible studies	Higher risk for colorectal cancer (CRC) amongst patients with type 2 diabetes mellitus (T2DM).	Meta-analysis
Ogunleye,Ogston Morris, Evans.	Study of the risk of cancer associated with type 2 diabetes	Record-linkage health-care datasets for Tayside, Scotland in 1993-2004	Significantly increased risks were observed for pancreatic, liver and colon cancer.	Cohort study
Cannata ,Fierz Vijayakumar,LeRoith.	Type 2 diabetes and cancer: what is the connection?	Patients with DM 2 and cancer.	Type 2 diabetes has been positively associated with cancers.	Review

(continued next page)

Authors	Purpose	Population	Findings	Method
Müssig Staiger Kantartzis Fritsche Kanz Häring	To give an overview on the relationship between diabetes mellitus and increased cancer risk.	Between diabetes mellitus, its treatment with insulin and insulin analogues and malignancies.	The relationship between elevated cancer risk and Type 2 diabetes mellitus has been shown by numerous epidemiological studies.	Review
Yang WS ,Shu XO Gao J, Li HL;Cai H, Yang G, Ji BT, Rothman N; Gao YT; Zheng W ; Xiang YB.	Prospective study has investigated the relationship between type 2 diabetes mellitus and and the risk of primary liver cancer.	Two population based cohorts.	lincreased risk of subsequent liver cancer.	Cohort
Bansal D, Bhansali A, Kapil G, Undela K, Tiwari P.	Examined the association between Type 2 diabetes and risk of prostate cancer	Conducting a detailed meta-analysis of all studies published regarding this subject	This meta-analysis provides strongest evidence supporting that Type 2 diabetes is significantly inversely associated with risk of developing prostate cancer.	Meta-analysis
Johnson JA; Carstensen B; Witte D; Bowker SL; Lipscombe L; Renehan AG.	Rreview factors related to cancer incidence in the diabetic population and cancer mortality.	Diabetic population	Substantial evidence suggests that people with type 2 diabetes have an increased risk of developing several types of cancers.	Review

Sample Characteristics

The sample in the 9 studies in this review contains people who with diabetes type 2 and diagnosed with cancer or risk for cancer. The sample contains male and female from different age. Cancer sites in sample were mainly liver, prostate, esophageal, and colorectal.

Results

The studies have shown a link between type 2 diabetes and cancer. Positive correlation between type 2 diabetes and cancers of the colon, breast, liver, and pancreas. In other hand the type 2 diabetes is significantly inversely associated with risk of developing prostate cancer, and this may be due to lower testosterone levels in men with type 2 diabetes.

Conclusion

Substantial evidence suggests that people with type 2 diabetes have an increased risk of developing several types of cancers. These associations may be due to a number of direct and indirect mechanisms. Recommendations to do more researches to decrease therisk of cancer for patients Suffer from diabetes and to increase the awareness among patients to do screening from time to time that reduce the risk of cancer.

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