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Editorial

- 2 Chief Editor - A. Abyad

Original Contribution / Clinical Investigation

- 3 **Assessing The Perception Of Nurses About Privacy Of Patients**
Manal AL-Bitawi, Ahmad AL- Omari
- 6 **Fatigue in Early Stage Among Jordanian Patients With Cancer Receiving Chemotherapy**
Kholoud Abu Obead, Sameer Yaser, Maysaa Khattab, Faisal Al-badaynah, Laila Saqer, Nehaya Al-dosouqi

Evidence Based Nursing

- 14 **Nurse-Led Chest Drain Clinic: A Case Study Of Change From National Health System in the UK**
Abdulsalam Y Taha, Akeel S Yousr, Kamil Z Zaidan

Education and Training

- 18 **The Relationship Between Pain Experience And Roy Adaptation Model: Application Of Theoretical Framework**
Bilal. S. H. Badr Naga, Nijmeh M. H. Al-Atiyyat
- 24 **A Holistic Approach to Bedside Teaching from the Views of Main Users**
Leili Mosalanejad, Mohsen Hojjat, Morteza Gholami
- 31 **The Blended Educational Program as A Modified Educational Program in Medical Education and the Effect on Students' Critical Thinking**
Mosalanejad L, Alipor A, Zandi B, Zare H, Shobeiri SM

FROM THE EDITOR



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This month we have three articles concerned with training of nurses. A study from Iran compared a designed blended educational method with classical face to face method in the cognitive effect of the program on the students' critical thinking. It concluded that the use of blended educational method is recommended for teaching in Medical and Para-medical sciences.

Another study from Iran looked at a holistic approach to bedside teaching from the views of main users. They concluded that it is necessary to appropriately train teachers to meet these standards, and while justifying students to implement this method and its benefits, patients' satisfaction, enhancing health care, and effective clinical governance should be provided.

A third paper from Jordan looked at the Relationship between Pain Experience and Roy Adaptation Model: Application of Theoretical Framework. The author concluded that by

understanding the relationships among self-concept, family functioning, functional status, and psychological adaptation, the nurse can identify the factors that lead to maladaptation, and supportive services can be implemented during the course of cancer treatment.

Another paper from Jordan explored Fatigue in Early Stage among Jordanian Patients with Cancer Receiving Chemotherapy. The purposes of the study were to (1) examine the impact of Chemotherapy on fatigue in Jordanian cancer patients, and (2) to chemotherapy related fatigue (CRF) with selected demographic variables such as age, sex, marital status, income, level of education, type of cancer, stage of disease, type of chemotherapy, body mass index, smoking and hemoglobin level. One group quasi-experimental co-relational design was used with 43 patients who had been diagnosed with cancer and required Chemotherapy treatment. Fatigue was measured using Piper Fatigue Scale (PFS). Data was collected over a period of six months and analyzed using descriptive statistics, paired-sample t-test, and Pearson Product Moment Correlation. Statistically significant differences were found between total fatigue scores as well as on behavioral, affective, sensory, and cognitive dimensions of PFS, before starting chemotherapy treatment and after 4 weeks from receiving the first dose of chemotherapy treatment.

Assessing the perception of nurses about the privacy of the patients was the focus of another paper from Jordan.

It stated that privacy is a legal right of patient/client, which flows from the fundamental rights to life, liberty and property, drives from the right to enjoy life and to be left alone (1+7+8). Respect for patients' privacy and dignity are long established principles of nursing practice (10). Invasion of a patient's privacy decreases the quality of care that is provided for the patient and decreases the trust of the patient in the medical team, which has a negative effect on the health status of the patient.

Finally a paper from Iraq explored the success of a nurse led chest drain clinic: a case study of change from the national health system in the UK. It concludes safe at home management of long-term chest drains was provided by this nurse-led clinic.

ASSESSING THE PERCEPTION OF NURSES ABOUT PRIVACY OF PATIENTS

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Introduction

Privacy is a legal right of patient/client, which flows from the fundamental rights to life, liberty and property, drives from the right to enjoy life and to be left alone (1+7+8). Respect for patients' privacy and dignity are long established principles of nursing practice (10). Invasion of a patient's privacy decreases the quality of care that is provided for the patient and decreases the trust of the patient in the medical team, which has a negative effect on the health status of the patient (2+4).

The concept of patient privacy is used in many disciplines and is recognized as one of the important concepts in nursing (3+10). In the practice, there are many forms for the patient privacy, including the physical, informational, decisional and proprietary privacy (5). In fact, even though most healthcare professionals know the limits of patient privacy and its forms very well, they have trouble applying them to their behaviors, particularly in hospital lifts where discussions

of patients' information may be overheard, or when the patient's body parts need to be exposed (6+9). This gap between the privacy perception and the privacy practice directs us toward this study. The purpose of this study is to assess the current practices and problems that are encountered with the perception of patient privacy among registered nurses at King Hussein Hospital.

Methodology

Descriptive design was used for this study. A convenience sample of 100 registered nurses was selected from both genders with different experiences, who are working in surgical and medical floors, in addition to critical units at King Hussein Hospital (Table 1).

A questionnaire was developed by the researchers and consisted of 20 statements that assessed mainly physical and informational privacy. The four point Likert scale questionnaire was reviewed by an expert panel consisting of nurse educator, nurse administrator and senior nurse colleague to establish

its content validity. The stability reliability was checked by administering the questionnaire to a group of 30 registered nurses selected conveniently from both genders with different experiences. Then after 2 weeks, the same instrument was administered to the same group. The correlation coefficients were calculated, and it was equal to (+0.80).

The Data collection was carried out on 14th of January 2010. Response rate was 82% (n=82).

Results

The patient privacy in our study was divided into two main divisions: Physical privacy and Informational privacy. Physical privacy includes preparing the environment that ensures patient privacy before any procedure is provided to the patient, like closing the room door or the drape, dismissing the visitors and company. Physical privacy also includes obtaining patient permission to expose any part of his/her body during any procedure. In our study, 55.5% of the nurses were always protecting the physical privacy, 34.9% usually, 7.4% rarely and 1.8% not at all. (Table 2 - next page)

The other type of patient privacy in our study was informational privacy, which includes protecting all the information and records concerning patients, and not sharing this information or records with anyone outside the patient's medical team without the patient's permission. In our study, just 18.5% of the study nurses were always protecting the informational privacy, 21.9% usually, 26.5% rarely and 32.8% not at all (Table 3 - next page).

On the other hand, 53.6% of the study nurses think that the most common invasions of the patients privacy is caused by the visitors and patient's company. While 36.5% of

Characteristics	Number	Percentage
• Gender:		
a. Male	28	34.1%
b. Female	54	65.8%
• Experience years:		
a. 1-10 years	51	62.1%
b. 11-20 years	31	37.8%
• Work Area:		
a. Critical units	42	51.2%
b. Floors/Wards	40	48.7%

Table 1: The characteristics of the sample

Characteristics	Always	Usually	Rarely	Not at all
• Gender:				
a. Male	21.9%	23.1%	19.5%	35.3%
b. Female	56%	23.1%	19.5%	1.2%
• Experience years:				
c. 1-10 years	50%	40.2%	6.09%	3.6%
d. 11-20 years	45.1%	30.4%	10.9%	13.4%
• Work Area:				
c. Critical units	60.9%	29.2%	7.3%	2.4%
d. Floors/Wards	47.5%	42.6%	6.09%	3.65%

Table 2: The protecting of patients' physical Privacy

Characteristics	Always	Usually	Rarely	Not at all
• Gender:				
a. Male	61.8%	30.6%	6.09%	1.2%
b. Female	44.9%	45.1%	7.7%	2.4%
• Experience years:				
e. 1-10 years	31.7%	43.4%	22.4%	2.4%
f. 11-20 years	59.7%	24.3%	14.6%	1.2%
• Work Area:				
e. Critical units	75.6%	20.7%	2.4%	1.2%
f. Floors/Wards	64%	28%	4.8%	2.4%

Table 3: The protecting of patients' informational Privacy

the study nurses think that the most common invasions of patient's privacy were caused by the health team members themselves.

Discussion

Physical and informational privacy are the most well known types of patient privacy among nurses (5). In the empirical studies, the concept of privacy has mainly been studied in hospital organizations using the physical dimension (5).

In our study, physical privacy was protected always & usually by 90% of the participants, which reflects the high standardized care that is provided by nurses. On the other hand, the results show that female nurses protect physical privacy more than male nurses, while the less experienced nurses (1-10 years) protect the privacy more than the highly experienced nurses (11-20 years). The less experienced nurses are more restricted by the rules of the hospital. The work area also has its effect on the physical privacy; in

critical units where there is a highly qualified team and more restriction on the visitors, physical privacy is more protected (~80%) than the floors.

The other type of privacy in our study is informational. Just 40.4% of the nurses were always and usually protect informational privacy. This small percentage in comparison with the physical privacy reflects the high need to train the nurses about how to protect informational privacy. Gender also had its effect on informational privacy; we find that the male nurses more protect the informational privacy than females. In addition, in the critical units informational privacy is also more protected than on the floors. The previous studies found that informational privacy was poorly protected in floors (10).

The causes for invasion of privacy in our study were the visitors mainly, then by the medical team. In the previous studies, the causes were

mainly by the medical team not by the visitors (4+6+10).

Conclusion and Recommendations

An assurance of patient's privacy is necessary to secure effective, high quality health care. Breaches of a patient's privacy compromises ethical health care and undermines patients' confidence in caregivers. Healthcare institutions must provide effective training to minimize these breaches. We hope that the Royal Medical Services will heed the call to improve discretion for the patients who entrust us with their care.

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FATIGUE IN EARLY STAGE AMONG JORDANIAN PATIENTS WITH CANCER RECEIVING CHEMOTHERAPY

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1. Introduction

Fatigue is one of the most prevalent symptoms of patients with cancer (1). It occurs across all ages, genders, cancer diagnoses, stages of disease, and treatment regimens (2). Cancer Related Fatigue (CRF) is different from everyday tiredness, which can be reversed by rest or sleep. It is characterized by an overall lack of energy, cognitive impairment, somnolence, mood disturbance, or muscle weakness (The National Comprehensive Cancer Network (NCCN), 2013). It is a multidimensional phenomenon, which evolves over time, compromising physical energy, mental capacity and the psychological condition of the patient with cancer (3).

Studies showed that 82-96% of patients receiving chemotherapy or radiotherapy (4, 5) suffer from fatigue during their treatment. And in the same magnitude; patients with metastatic disease suffered from fatigue (6). CRF is under reported and is under-evaluated by health care givers (7) despite the presence of growing evidence on the impact of CRF on quality of life (QoL) (8).

Cancer Related Fatigue can be caused or potentially predisposed by various factors. A multidimensional model which includes situational, biological, physical symptoms and psychological symptoms, has been explored for CRF, beside that situational dimensions; inpatient status, analgesic use and stage of cancer were also correlated significantly with fatigue level (9). For a biological dimension hemoglobin level was an independent predictive factor for CRF ($P = 0.02$) (9). The impact of anemia on CRF may be different depending on onset time, patient age, and co-morbidity (10).

Despite the high prevalence of fatigue and potential negative effect on patients' activities and emotional

Abstract

The purposes of this study were to (1) examine the impact of Chemotherapy on fatigue in Jordanian cancer patients, and (2) to chemotherapy related fatigue (CRF) with selected demographic variables such as age, sex, marital status, income, level of education, type of cancer, stage of disease, type of chemotherapy, body mass index, smoking and hemoglobin level. One group quasi-experimental co-relational design was used with 43 patients who had been diagnosed with cancer and required Chemotherapy treatment. Fatigue was measured using Piper Fatigue Scale (PFS). Data was collected over a period of six months and analyzed using descriptive statistics, paired-sample t-test, and Pearson Product Moment Correlation. Statistically significant differences were

found between total fatigue scores as well as on behavioral, affective, sensory, and cognitive dimensions of PFS, before starting chemotherapy treatment and after 4 weeks from receiving the first dose of chemotherapy treatment.

Key words: Jordan, cancer patients, fatigue, chemotherapy

well-being, research in fatigue is still underdeveloped and there are no studies reporting on CRF among Jordanian population. So, this study is an attempt to explore fatigue among Jordanian cancer patients who are being treated with chemotherapy in Jordan. In addition, it is anticipated that this study will have the potential to motivate staff to take fatigue into consideration while providing care for oncology patients.

Methods

Design

One group quasi-experimental correlational design was used to examine the impact of chemotherapy treatment on Jordanian cancer patients' fatigue, and to examine the relationship between selected demographic variables and fatigue.

Sample

A consecutive sampling procedure was used to recruit potential participants for this study. The inclusion criteria are as follows: (a) 18-65 years old, (b) has no history of psychiatric or mental problem, (c) has chemotherapy for the first time, (d) is treated with chemotherapy only, (e) has Hemoglobin (Hb) level above 12 g /dl at the beginning of the study, (g) has no history of cardiac, respiratory or medical illnesses, (h) is able to give verbal consent to participate in this study, and (i) diagnosed with solid and metastatic disease.

The sample size was determined by Cohen (1988) formula. Cohen identified three levels for the effect of the sample size when using Paired Sample T test: small 0.2, medium 0.5, and large 0.8. Based on this classification and literature review, the medium effect size for comparison between two means was anticipated for this study. Testing one tailed hypothesis at significant level of alpha 0.05, the sample size was determined to be 43 participants. Therefore, the convenience sample of 43 participants who were treated with chemotherapy at KHCC, and met the inclusion criteria, agreed

to participate, and were able to complete the study measurements participated in this study. The researcher interviewed each participant using the designated questionnaires PFS and DDS of the study, twice, immediately before receiving first cycle of chemotherapy and after 4 weeks from receiving first dose of chemotherapy treatment.

Setting

The King Hussein Cancer Center (KHCC) is a medical center located in Amman City, the capital of Jordan. It treats both adult and pediatric patients. KHCC treats over 3500 new cancer patients each year from Jordan and the region. KHCC has established programs that focus on all stages of comprehensive cancer care: from prevention and early detection, through diagnosis and treatment, to palliative care.

Instrumentation

The following instruments were used to collect data from all participants in this study:

1. Demographic Data Sheet

The Demographic Data Sheet (DDS) was developed by the researcher to elicit background information about the patients. The DDS includes questions related to age, marital status, gender, level of education, monthly income, occupation, religion, type of cancer, stage of disease, complications of cancer, type of chemotherapy, dose of chemotherapy, chemotherapy side effects, body mass index, hemoglobin level at the beginning of treatment, hemoglobin level after 4 weeks from receiving first dose of chemotherapy treatment

2. Piper Fatigue Scale (PFS)

The Piper Fatigue Scale (PFS) is a multidimensional tool designed to measure the level of fatigue subjectively, and has been widely used in research. It has the potential to differentiate three levels of fatigue; mild, moderate and severe (11). Piper Fatigue

Scale (PFS) is congruent with the conceptual framework of this study, which acknowledges fatigue as a subjective phenomenon.

After gaining permission from the original author, the instrument was translated to Arabic to minimize barriers of assessment with Arabic participants. The translated version of the instrument was back translated to ensure content and semantic validity. Content validity was assessed by a panel of experts in nursing who reviewed the items for clarity, relevance, comprehensiveness, understandability, and ease of administration. The panel of experts recommended no modifications.

Before embarking on the full study, a pilot test of the Arabic version was conducted with 10 participants within the target population to ensure that the tool is readable and can be understood by those who will use it. The pilot study indicated that Arabic version of PFS was in general readable, and easily understood. Participants did not request any additional information to be included in the questions. Structured interview for each participant required from 10 to 15 minutes. Reliability coefficient alpha was calculated for total PFS scores and subscales scores. The results showed that the Arabic version of PFS is a reliable instrument, with internal consistency of the entire Arabic version of PFS ($\alpha = 0.947$), and for the four subscales: behavioral, affective, sensory, and cognitive dimension ($\alpha = 0.915, 0.807, 0.952, \text{ and } 0.864$) respectively.

Ethical consideration

The study protocol was approved by the Institutional Review Board at King Hussein Cancer Centre administration, to conduct the study. Daily visits were made to the setting to check for participants who met the inclusion criteria. Once a participant was identified, verbal consent was obtained after providing adequate information about the significance and purposes of the

study. Participants were assured that participation was voluntary, and participants were told to feel free to withdraw at any time. Participants were assured that their responses would be treated confidentially and information that might reveal their identity would not be recorded and only aggregated data would be communicated.

Results

Participants' Characteristics

All participants were treated with different types of chemotherapy at KHCC. The age of participants ranged from 21-73 years ($M = 45.98$, $SD = 13.27$). Most participants were female ($n = 26$), married ($n = 36$), had high school diploma ($n = 30$), and were employed ($n = 23$); 23

participants had a monthly income less than 650 JD, about 93% were non-smokers, diagnosed with breast cancer ($n = 17$), obesity was present in about 64.4% of participants, most of them were treated with Anthracyclin based regimen. (See Table 1 (Part A below, Part B, top of page 9), for sociodemographic characteristics of the sample).

Table 1: Sociodemographic Characteristics of the Sample (Part A. Part B next page)

Character	Category	Frequency	%	Mean	Standard deviation	Range
Sex	Male	17	39.5			
	Female	26	60.5			
Age	<50	27	62.7	45.98	13.27	21-74
	50-59	10	23.3			
	>60	6	14			
Marital Status	Single	6	14			
	Married	36	83.7			
	Widow	0	0			
	Divorced	1	2.3			
Level of Education	Illiterate	0	0			
	≤ High School	13	30.2			
	>High School	30	69.8			
Occupation	Unemployed	20	46.6			
	Employed	23	53.4			
Monthly Income (JD)	≤650	23	53.4			
	>650	20	46.6			
Smoking	Non	29	67.4			
	Ex-smoker	11	25.6			
	Smoker	3	7			
Duration Time to reach the hospital	≤1hour	34	79			
	>1hour	9	21			
Type of Transportation	Own car	39	90.7			
	Public	4	9.3			
	Others	0	0			
Chemotherapy Dose Number	1	35	81.4			
	2	3	7			
	3	3	7			
	4	2	4.7			
Type of Cancer	Breast	17	39.6			
	Bladder	1	2.3			
	Colon	5	11.6			
	Lymphoma	8	18.6			
	MM	1	2.3			
	NSCLC	4	9.3			
	Ovarian	1	2.3			
	Prostate	3	7			
	Stomach	1	2.3			
	Testicular	2	4.7			

Table 1: Sociodemographic Characteristics of the Sample (Part B)

Type of Chemotherapy	Anthracyclin based regimen: AC+ FEC+ doxorubicin.	20	46.5			
	Platinum based regimen: FOLFOX, DCF (Cisplatin+Docetaxel+Fluorouracil)+ Cisplatin+ Radiotherapy+ Gemcitabin+Carboplatin.	6	14			
		9	20.9			
		8	18.6			
	Lymphoma regimen: R-CHOP, ABVD Others: Gemcitabine, BEP					
Stages of Disease	One	29	67.5			
	Two	14	32.5			
	Three	0	0			
	Four	0	0			
Hemoglobin level at the beginning of treatment				12.54	1.82	
Hemoglobin level after 4 weeks of treatment				12.23	1.68	
BMI at the beginning of treatment	<25	15	34.5			
	25-29.9	17	39.1			
	≥30	11	25.4			
BMI after 4 weeks of treatment	<25	16	37.3			
	25-29.9	16	37.3			
	≥30	11	25.4			

Table 2: Means and Standard Deviations of the Scores on all Subscales of PFS prior to Receiving First Dose of Chemotherapy treatment

Group	Behavioral	Affective	Sensory	Cognitive	Total PFS Scores
All participants					
M	1.27	2.86	3.8	3.9	2.96
SD	1.10	1.57	1.63	1.97	1.45
Highest Score	10	10	10	10	10

(N=43)

Baseline Measurements (pre-treatment)

Piper Fatigue Scale (PFS) Scores

The total PFS scores of participants ranged from 0.75 to 6.2 ($M=2.96$, $SD=1.45$). Almost all participants scored low on all subscales of PFS prior to receiving first dose of chemotherapy treatment; the behavioral subscale scores ranged from 0.00 to 4.83 ($M=1.27$, $SD=1.1$), affective subscale scores ranged from 1.00 to 6.6 ($M=2.86$, $SD=1.57$), sensory subscale scores ranged from 1.00 to 7.8 ($M=3.8$, $SD=1.63$), and cognitive subscale scores ranged from 1.00 to 8.2 ($M=3.9$, $SD=1.97$), (see Table 2, previous page, for means and standard deviations of the scores on all subscales of PFS prior to receiving first dose of chemotherapy treatment).

Post Treatment Measurements

The total participants' scores on PFS after 4 weeks from receiving first dose of chemotherapy treatment ranged from 1.83-7.08 ($M=5.26$, $SD=1.01$). Almost all participants scored high on all subscales of the PFS after 4 weeks from receiving first dose of chemotherapy treatment with behavioural subscale that ranged from 0.17 to 6.83 ($M=3.51$, $SD=1.46$), affective subscale scores ranged from 2.2 to 7.8 ($M=5.05$, $SD=1.27$), sensory subscale scores ranged from 2.4 to 8.8 ($M=6.19$, $SD=1.36$), and cognitive subscale scores ranged from 1.33 to 8.5 ($M=6.31$, $SD=1.33$), (see Table 3, next page, for means and standard deviations of the scores on all subscales of PFS after 4 weeks from receiving first dose of chemotherapy treatment).

Research Question 1 (Fatigue Score).

To answer the first research question "Do patients who receive chemotherapy as a primary treatment for their cancer have statistically higher scores of fatigue as measured by PFSs after 4 weeks from the first dose compared to their scores at the beginning of their treatments?" A paired sample t-test was used for total scores, and each

subscale of PFS. Paired sample t-test revealed significant differences between respondents' total mean scores of fatigue pre and post 4 weeks chemotherapy treatment as measured by total PFS questionnaire ($t=-2.31$, $df=42$, $P<0.05$). In addition, significant differences were found between pre and after 4 weeks from receiving the first dose of chemotherapy treatment scores for behavioral, affective, sensory, and cognitive dimensions subscales ($t=-2.24$, -2.19 , -2.4 , -2.4 , $df=42$, $P<0.05$) respectively, (see Table 4 for the results of paired-sample t-test for fatigue scores as measured by PFS).

Research Question 2

"Is there a relationship between fatigue scores (PFS) and selected demographic variables such as age, sex, marital status, Income, level of education, type of cancer, stage of disease, type of chemotherapy, dose of chemotherapy, body mass index, smoking and hemoglobin level among Jordanian patients who receive chemotherapy as a primary treatment for their cancer?". To find the relationship between fatigue score and sociodemographic variables Pearson Product Moment Correlation and Biserial Correlation Coefficient were used.

Pearson Product Moment Correlation Coefficient was used to find the correlation between fatigue scores as measured by PFS and selected sociodemographic variables on a continuous level. Pearson Product Moment Correlation showed a significant negative relationship between fatigue scores as measured by PFS and hemoglobin level ($r=-0.04$, $P<0.01$). (See Table 5 for the results of Pearson Product Moment Correlation Coefficient between fatigue Scores as measured by PFS and sociodemographic variables on a continuous level).

Biserial Correlation Coefficient was used to find the correlation between fatigue scores as measured by PFS and selected sociodemographic variables on nominal and dichotomus levels.

Biserial Correlation Coefficient showed a significant negative relationship between fatigue scores measured by PFS and sex ($r=-0.026$, $P<0.01$). Also, Biserial Correlation Coefficient showed a positive relationship between fatigue scores measured by PFS and type of chemotherapy especially patients treated with Anthracyclin based regimen ($r=0.0398$, $P<0.05$). (See Table 6 for the results of Biserial Correlation Coefficient between fatigue scores as measured by PFS and sociodemographic variables on nominal and dichotomus levels).

Discussion

Regarding question 1

The findings of this study showed that the patients who received chemotherapy as a primary treatment for their cancer have statistically higher scores of fatigue as measured by PFS's after four weeks from the first dose compared to their scores at the beginning of their treatments; and thus demonstrated that fatigue is more related to treatment of cancer than to the cancer and may persist after therapy (12). The reason for increased fatigue scores after 4 weeks from the first dose may be explained based on the fact that the etiology of fatigue in cancer patients is complex, and multidimensional (13). Previous studies (14; 15) found that fatigue precedes, accompanies, and follows most tumours and its treatment. Chemotherapy and radiotherapy cause cellular death (14). As a consequence several chemicals are released into circulation. Such chemicals may increase basal metabolic rate, which may affect energy level (15).

Many cancer patients feel fatigued for several months or even years after their treatment with chemotherapy (16). The previous studies found that fatigue is the most common side effect of cancer treatment including chemotherapy. The mechanism of how chemotherapy causes fatigue is unknown (17) but some studies explained that fatigue related to chemotherapy may be caused by

Table 3: Means and Standard Deviations of the Scores on all Subscales of PFS after 4 weeks from receiving first dose of chemotherapy treatment

Group	Behavioral	Affective	Sensory	Cognitive	Total PFS Scores
All participants					
M	3.51	5.05	6.19	6.31	5.26
SD	1.46	1.27	1.36	1.33	1.01
Highest Score	10	10	10	10	10

(N=43)

Table 4

PFS subscale	Time	N	M	SD	t	df	Sig
Behavioral	Pre-chemotherapy	43	1.27	1.1	-2.24*	42	0.000
	4 weeks after first dose	43	3.51	1.46			
Affective	Pre-chemotherapy	43	2.86	1.57	-2.19*	42	0.000
	4 weeks after first dose	43	5.05	1.27			
Sensory	Pre-chemotherapy	43	3.8	1.63	-2.4*	42	0.000
	4 weeks after first dose	43	6.19	1.36			
Cognitive	Pre-chemotherapy	43	3.9	1.97	-2.4*	42	0.000
	4 weeks after first dose	43	6.31	1.33			
Total PFS	Pre-chemotherapy	43	2.96	1.45	-2.31*	42	0.000
	4 weeks after first dose	43	5.26	1.01			

*P <0.05

Table 5: Results of Pearson Product Correlation Coefficient between Fatigue Scores as measured by PFS and Sociodemographic Variables on a Continuous Level

Sociodemographic Variables	PFS Scores
Hemoglobin level	-0.04**
BMI	0.21

** Correlation is significant at 0.01 level.

the need for extra energy for the process of the healing and repairing body tissues that are damaged by treatment in addition to the building up of toxic substances that are left in the body after using of cancer treatment for killing malignant cells(12).

Research question 2

Of the socio-demographic variables, sex correlates negatively with

fatigue. This finding is consistent with many previous studies that showed; women who received chemotherapy reported higher fatigue severity scores than men (18). In this study it could be explained by the differences in the ratio of female participants to male; where most of the study sample are females.

Anemia can occur as a result of the cancer or the cancer treatment (12). Anemia was found to be a common cause of fatigue (12). In this study; the patients with low hemoglobin level perceived a higher level of fatigue than those with high hemoglobin level. This result confirmed the results of previous studies (19). This could be explained by when patients become anemic there is a decrease in the number of circulating red blood cells, the

Sociodemographic Variables	PFS Scores
Age	-0.23
Monthly income	0.063
Sex	-0.026**
Marital status	-0.059
Educational level	-0.042
Job	0.059
Type of cancer	0.74
Smoking	0.34
Type of chemotherapy	0.0398*
Stages of disease	-0.046
Duration time to reach hospital	-0.26
Type of Transportation	-0.272
Dose of Chemotherapy	-0.12

Table 6: Results of Biserial Correlation Coefficient between Fatigue Scores as measured by PFS and Sociodemographic Variables on Nominal and Dichotomus Levels

*Correlation is significant at 0.05 levels.

** Correlation is significant at 0.01 level.

oxygen carrying capacity of the blood is diminished and thus make the patient's heart and lungs work harder and make patients feel tired and weak due to the inadequate supply of oxygen to muscles and other organs (12, 19).

There was a relationship between fatigue and type of chemotherapy (Anthracyclin based regimen). Previous studies demonstrated that fatigue is more related to treatment than to cancer and it may be last after therapy (20). Anthracyclin containing chemotherapy is well known to cause dose dependent progressive cardiac damage, heart failure and cardio toxicities which in turn play an important role in decreased oxygenated blood supply to all body tissues and finalized with fatigue (21). Treatment with the Anthracycline can result in the production of toxic substances as within the cancer cells (20). The more and longer accumulative dose of Anthracyclin, the more destructive effect on the body (21). There was no available previous studies that assessed fatigue associated with low dose of Anthracyclin.

No relationship was found in this study between BMI and fatigue that could be related to the short duration

(four weeks) between pre and post treatment with chemotherapy which is not enough to detect changes in BMI and so changes in perceiving level of fatigue.

Limitations

1. The use of convenience sample and the small sample size were a major limitation since only 43 participants were able to complete this study. So the generalizability of the findings of this study is limited. The inferential statistics performed on these data must, therefore, be interpreted with extreme caution, and no conclusions can be drawn with certainty. Therefore, these limitations were threatening the generalizability of the findings.
2. Validity and reliability of PFS need to be tested in further study.

Conclusions

Despite the limitations of this study, the current and previous research findings, as well as the well-established facts about cancer and chemotherapy, the following conclusions can be drawn:

1. Cancer patients receiving chemotherapy are at risk for considerable treatment related fatigue. Therefore, health care providers should incorporate fatigue in routine assessment of patients who are being treated for cancer or being followed after completing treatment.
2. Fatigue is influenced by hemoglobin level and gender. Therefore, health care providers have an obligation to take these variables into account when caring for cancer patients.

Recommendations

1. Replicating this study with large samples is necessary before making any generalization of the results.
2. Healthcare providers should incorporate fatigue in routine assessments of patients who are being treated for cancer or being followed after completing treatment.
3. Help healthcare providers to consider how people understand, interpret feelings, and sensations associated with fatigue.
4. Teach patients, parents, and health care professionals about the symptoms and impact of

fatigue and the treatable nature of fatigue.

5. Develop new instruments to assess Jordanian cancer patients' fatigue from their cultural perspectives.
6. Assess patient' responses to fatigue taking into consideration verbal and non-verbal responses that vary from one patient to another.
7. Further research is needed to compare levels of fatigue related to chemotherapy and other cancer therapy.

Implications

The following are implications for nursing and medical research, education, practice, and administration based on the results of this study:

1. Health Care Providers should assess fatigue for all cancer patients periodically during their disease and treatment.
2. Course design individualized nursing and medical care plan for their patients taking into consideration fatigue.
3. Health care educators are advised to incorporate fatigue issues in nursing and medical educational programs.
4. Results of this study indicated the need for further studies to explore the effectiveness of nursing and medical strategies used to cope with fatigue among patients in general, and cancer patients in particular.
5. Further studies are needed to assess knowledge, and attitude toward fatigue among nurses and doctors.
6. Hospital administrators must encourage workshops for nurses and other health team members who are responsible for patients' education in strategies used to cope with fatigue.
7. Hospital administrators are encouraged to develop teaching materials like pamphlets, booklets, and brochures about chemotherapy to reduce fatigue in cancer patients and increase their knowledge about it.
8. Establish staff development for nurses in the oncology centers to assist cancer patients to develop fatigue reduction and management programs.
9. Health care administrator should develop an assessment tool to predict patients who are at increased risk for experiencing high fatigue levels during and after cancer treatment.

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NURSE-LED CHEST DRAIN CLINIC: A CASE STUDY OF CHANGE FROM NATIONAL HEALTH SYSTEM IN UK

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Introduction

The National Health System in the United Kingdom (UK) has witnessed dramatic changes in the role of nurses over the last 2 decades. The professional standard of nurses has very much improved. The public has realized this change and their trust in services provided by nurses has also increased. There are many clinics now in the UK run by specialized nurses such as Chest-Pain Clinic, Endoscopy Clinic, Bronchiectasis Clinic and others.[1,2] Thoracic surgery is no exception. Patients with chest drains placed for different indications like drainage of air and/or fluid in the pleural space are usually managed in hospital till the drainage stops and the chest tube is removed. This sometimes necessitates a long stay in hospital for persistent air and/or fluid drainage. This is undoubtedly associated with increased cost and burden on hospital resources. More time should be spent by physicians looking after such patients until they can be discharged home with no chest drain. Herein, we present the project of Nurse-led Chest Drain Clinic in Guy's and St Thomas's Hospital, London. The aim is to analyze the process of successful change achieved by nurses in this project.

Materials and Methods

A project of change was designed to set up an outpatient clinic run by clinical nurse specialists for patients discharged home with an ambulatory chest drain system in situ. The project is observed and analyzed via interviews with the responsible nurses. Place: the clinic was located at Guy's Hospital in the Cardiothoracic Outpatient Department, 1st Floor, Thomas Guy's House.

Clinic Times: Monday afternoon 14.00 to 16.00, 4 slots of 30 minutes per patient.

Abstract

Background and Objective:

There are many nurse-led clinics now in the UK, such as Chest-Pain, Endoscopy and Bronchiectasis Clinics. Herein, we present the project of Nurse-led Chest Drain Clinic in Guy's and St Thomas, s Hospital, London. The aim is to analyze this change project.

Methods: A project of change was designed to set up an outpatient clinic run by specialist clinical nurses for patients discharged home with an ambulatory chest drain system in situ. The project is observed and analyzed via interviews with the responsible nurses.

Results: The clinic was established in 2005 and run by two Nurse Case Managers. 60 patients were seen in 2007 and the clinic remained well attended. Patients were happy to spend less time in hospital as they could stay safely with their families.

Conclusions: A safe at home management of long-term chest drains was provided by this nurse-led clinic.

Key words: chest drain, nurses, outpatient clinic

It was run by 2 Nurse Case Managers; both had specialized thoracic surgery skills and experience.

Patient Population: any patient with a chest drain in situ who can be managed at home by a District Nurse, or patients who had recently had a chest drain in hospital and required follow up.

On discharge home, the patient was given an information sheet and his/her District Nurse was informed by phone about the care of chest drain at home. The first appointment would be after 1 week. The nurse would assess level of fluid output and/or history of air leak. A chest X-ray would be ordered and reviewed by the clinic nurse specialist with the consultant thoracic surgeon or registrar. A clinical decision was to be made as to remove or keep the drain. Chest drain would be removed by the nurse when necessary. The consultant's message was clear: whenever in doubt, do not remove the chest drain.

A letter would be written to the GP, thoracic surgeon or the oncologist. A weekly follow up was necessary as long as the drain remained in situ.[3] Most patients with air leak could have their chest drain removed in 2 weeks. Examples of the devices used in patient's care are shown in Figures 1-3. The community nurses used to be afraid of caring for a patient with a chest drain. This fear was alleviated by annual workshops held in the department to educate them about chest drain care and other health topics.

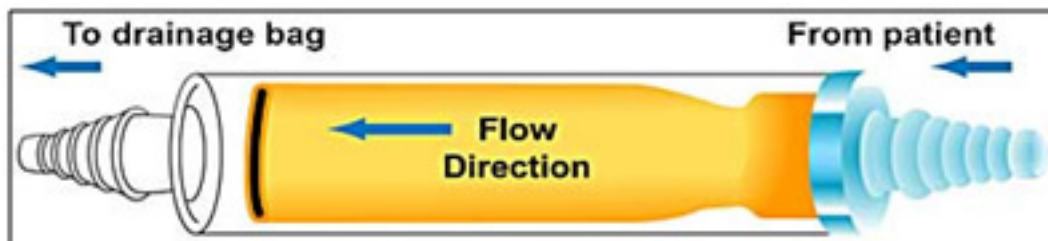


Figure 1: Heimlich chest drain valve

Source: www.medicine-on-line.com image 011



Figure 2: Heimlich valve attached to chest tube

Source: www.vygonvet.co.uk



Figure 3: a plastic bag attached to chest drain.

Source: The Guy's and St Thomas, NHS Foundation Trust December-2007 Newsletter

Results

The change took about 6 months. The clinic was established with co-operation of the consultant surgeons and other stakeholders. The actual work in the clinic began in 2005. An audit of all patients visiting the clinic was kept by the Nurse Case Manager on Excel. Numbers and outcomes were recorded. During the year 2007, 60 patients were seen i.e., 5 patients per week. "The Chest Drain Clinic remains well-attended, we see an increase in the number of patients managing their long-term drains at home and we are happy for patients to spend less time in hospital when they prefer to be at home closer to their families"[4] said the nurse case managers. Patients and their relatives felt happier, being earlier discharged and staying at home.

Discussion

The Thoracic surgical department in Guy's Hospital at the time of the study had 4 consultant thoracic surgeons, 2 senior nurses and 28 beds.[3] The number of beds was considered relatively small in relation to the size of the served population (estimated to be around 15 million persons).[3,4] It is well known that patients with persistent air leak and/or fluid drainage may occupy beds for a long time thus putting a burden on hospital resources. The few surgeons in the department used to spend a considerable time in the follow up of such patients.

The idea of shifting the care of patients with chest drains after leaving the hospital, from doctors to nurses, was

thus born for many reasons. The Guy's and St Thomas, NHS Foundation Trust encouraged projects which aimed at a better use of beds, providing enough beds for cancer patients which comprised 75% of thoracic surgery work in Guy's Hospital [3] and shortens the waiting period before operations and thus meeting the national guidelines for cancer therapy.[3] Better use of beds and money saving is expected from such a project without affecting the patient's care. There were 2 senior nurses who specialized in thoracic surgery working in the department. They used to look after patients with chest drains while they were in the ward. They strongly believed that they could do the same service in an outpatient clinic. Although no Chest Drain Clinic was run before in UK, there were similar nurse-led projects in NHS like chest pain and endoscopy clinics which stimulated the Thoracic Surgery Specialist nurses to go ahead in their project. Literature review included a few similar models in other countries which formed a background for the project.[5] The literature also demonstrated that outpatient management of patients with spontaneous pneumothorax or even prolonged air leak appeared safe, efficient and economic.[6] The nurse specialists were further encouraged by the co-operation and support of the consultant surgeons. Patients always preferred to be at home as opposed to being in the hospital. The public in UK are increasingly aware about the current roles played by nurses in NHS. The communication system between the Senior Case Managers, patients and Community Nurses was good enough to support the new project beside the recent availability of compact, self-contained, clean and more user-friendly devices which can be strapped to the belt have been provided by manufacturing companies. [6] Therefore there was little to worry about.

On the other hand, the nurse case managers embarking on this change realized some potential threats to their success like slippage of the drain after patient's discharge, inability of the District Nurse to look after the chest drain, the clinic might not be considered a real clinic as that run by doctors and a minority of patients may prefer to be seen by the consultant rather than the nurse case manager.

The skilled nurse case managers shared a future vision with the doctors and agreed upon establishing the new clinic. They had put a plan forward that consists of identification and addressing the stakeholders as well as changing the systems of discharge, follow-up and referral of patients.

The identified stakeholders were: doctors (consultant surgeons and oncologists, GPs and juniors), patients, hospital manager, manufacturing companies and public. All were supportive; however, junior doctors did not make proper referrals initially.

In conclusion, out-patient care offered by nurse-led clinics to patients with chest drain for prolonged air leak provided many advantages over the in-patient care. The successful implementation of the change project highlights the techniques necessary to achieve similar changes.

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THE RELATIONSHIP BETWEEN PAIN EXPERIENCE AND ROY ADAPTATION MODEL: APPLICATION OF THEORETICAL FRAMEWORK

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Introduction

Roy Adaptation Model (RAM) is one of the most frequently used conceptual frameworks to guide nursing research, education and practice; the contributions of this theoretical framework are that it will lead to more systematic, researcher guided and increased quality of nursing practice. It could foster nursing knowledge through organized research and it could provide a more organized curriculum.

The model provides a way of thinking about people and their environment that is useful in any setting. Also, Models give nurses autonomy and accountability in their practice, promote communication among nurses and guide implementation of research, practice, education and administration.

The RAM was found useful in practice in medical, surgical, emergency, maternity and psychiatry nursing. It provides a systematic way of care through Roy's six-step nursing process. Also it is useful in nursing education; in curricula synthesis and setting goals for nursing education, and distinction of the nursing profession from other health professions. In addition, the RAM generated a number of hypotheses that guide nursing research in studies of cancer, cardiac cases, childbirth experience, chronic illness and emergency cases. But since the RAM focuses on individuals it was used very little in administration. It has been used mainly in leadership, mentorship and quality assessment.

RAM is a highly developed and widely used conceptual description of nursing. It is accepted by the nursing community, in nursing practice, education, and research. It is commonly used in different countries to guide studies that

Abstract

Roy Adaptation Model (RAM) provides knowledge and broad understanding of the person as both a physiological being in a physical world and thinking. According to RAM, the overall goal of nursing is to focus on promoting health of the individual and group by promoting adaptation in each of four adaptive modes: physiological-physical, self-concept, role function, and interdependence. It could foster nursing knowledge through organized research and it could provide a more organized curriculum. The cancer patients who are under treatment with chemotherapy and radiotherapy may experience a physical self-disruption such as fatigue, altered skin integrity, fluid and electrolyte imbalances and physical changes (hair loss). This experience in physiological changes may influence the role function of the patient (social interaction with peers) and changes in the interdependence mode (family); if the families understand how to support the patient, the patient may have an integrated adaptation level. By understanding the relationships among self-concept, family functioning, functional status, and psychological adaptation, the

nurse can identify the factors that lead to mal adaptation, and supportive services can be implemented during the course of cancer treatment. Research that studied the experience of cancer-related pain confirmed that pain is a multidimensional symptom that consists of feelings of hopelessness, helplessness, emotional distress, and has a negative impact on coping mechanism. Also, cancer pain was confirmed by researchers as a complex phenomenon associated with adverse physiologic, psychosocial consequences, (depression, anxiety), cognitive, behavioral, and socio-cultural dimensions. There are many factors associated with cancer related pain such as type of cancer, stage of disease, type of treatment received and location of cancer. Such findings have raised the importance for researchers to study the experience of cancer related-pain in a comprehensive approach using the multidimensional aspects of cancer pain experience.

Keywords: Roy Adaptation model, pain, cancer, adaptation, and theoretical framework

address adaptation concepts. Understanding Roy's theory is extremely significant for researchers because it helps them in building theoretical frameworks to guided research study that reflects enhancement of adaptation for individuals and groups in the four adaptive modes.

The aim of this paper was to use RAM as a theoretical framework in my research study that evaluated pain experience among patients receiving cancer treatments.

Overview of Theory

The Roy Adaptation Model for Nursing had its beginning with Sister Callista Roy who entered the masters program in pediatric nursing at the University of California in Los Angeles in 1964. During Roy's first seminar in pediatric nursing, she proposed that the goal of nursing was promoting patient adaptation. Dorothy E Johnson, her tutor, encouraged her to develop her concept of adaptation as a framework for nursing throughout the course of her master's program.

RAM has five main concepts of nursing theory: the health, the person, the nurse, the adaptation and the environment. Roy views the person in a holistic way. The core concept in her model is adaptation. The concept of adaptation assumes that a person is an open system who responds to stimuli from both outside and inside of the person. Environmental stimuli are categorized as focal, contextual, and residual stimuli. Focal stimuli represent an immediate and apparent cause of the problem; contextual stimuli are other causative factors whilst residual stimuli relate to the patient's past experiences with the illness and how these experiences may impact upon the patient's current condition. Regulator and cognator activities are manifested through a patient's illness. Regulator activities are physiological in nature whilst cognator activities may range from a physical attribute to a psychological

or social attribute. The nurse's role while caring for a patient involves manipulating the stimuli that comes from the environment so that they fall within the client's field of positive coping, resulting in adaptation.

Adaptation is considered to be the positive response to a stimulus, whereas a negative response is described as maladaptation. Adaptation takes place in one physiological mode and three psychosocial modes. The psychosocial mode of adaptation includes self-concept, role function, and interdependence mode. The four modes of adaptation are interrelated in relationship between pain experience diminution and RAM model concepts.

Literature Review of RAM

Henderson et al. (2003) used the three environmental stimuli defined by RAM to guide their study. The focal stimulus in this study was the diagnosis of breast cancer; the contextual stimuli were demographic data such as age, marital status, educational level, income and length of time since diagnosis; the residual stimuli were unknown factors that may affect the coping strategies of the patients.

Waweru, et al. (2008) conceptualized the adaptation of children living with AIDS in the self-concept mode. They considered coping with AIDS as focal stimuli, the environment of care as the contextual stimulus, while the developmental level of the school aged children was the residual stimulus. Waweru, et al. (2008) has completely supported the RAM in which various stimuli are affecting the self-concept mode; this study indicated that RAM could be used cross culturally. On the contrary, other researchers created questions based on the four adaptive modes of RAM to guide their interviews.

Zeigler, et al. (2004) reported the findings of a program evaluation project mentioned previously. This project was designed to identify

the experience of both participants in and facilitators of, a community breast cancer support group.

Similarly, a study by Ramini, et al. (2008) aimed to identify the experiences of adaptive strategies used by adolescents with cancer. The questions have been used to reflect the physiological mode in Zeigler et al's study which was related to the most distressing physical problems. The self-concept mode includes questions associated with feelings about body and self. The role function mode includes questions about the activities done by the breast cancer support group and the satisfaction level indicated these activities. The questions reflecting the interdependence mode were related to the quality and quantity of support received by the support group.

RAM was used in the study "Embracing Changes: Adaptation by Adolescents with Cancer" for its ability to describe a model of the adaptation process that integrates multiple adaptive modes of the individual. Accordingly, the following questions were asked to guide the study,

- What experiences do adolescents with cancer report that reflect the four adaptive modes of the RAM?
- Do reported experiences during adolescence provide evidence of positive adaptive responses?

Researchers used a theory-based descriptive method conducted in a children's hematology/oncology clinic and the participants included adolescents and young adults who had experienced cancer as adolescents. They designed open-ended interview questions which were based on the four adaptive models of the RAM: physiological, self-concept, role function, and interdependence. Questions were intended to be administered in 30-45 minute audio-taped interviews. Adolescents and young adults reported evidence of positive adaptation. Recognition of physiological effects and the inability of health care personnel to adequately intervene made

adolescents and young adults more confident in their own experiences and interpretations of those experiences, affecting self-concept and role function modes. Adolescents and young adults reported creatively managing bodily changes and keeping positive attitudes of “embracing changes” rather than being stifled or intimidated by them. They were able to develop personal networks and draw needed support from the networks. Participants reported many opportunities to feel normal and to develop friendships with others who were adapting to cancer.

Theoretical Framework

The researcher used Roy Adaptation Model (RAM) as a theoretical framework (1) to guide this proposal, (2) to clarify multidimensional aspects of cancer related pain with forth adaptive modes of RAM which are affected by external and internal stimuli (focal, contextual, and Residual stimuli) that cause cancer related pain (3) and to note the effect of adaptive modes on adaptive level (4) to correlate research variable with theory concept, (5) and to predict interpretations, recommendations (6) and to answer the following research questions:

1. How cancer patients describe pain (physiologic, sensory, emotional, and socio-cultural)?
2. What are the relationships of the variables (e.g., disease etiology, stage of cancer, pain intensity, socio-cultural beliefs and affective variables) with pain experience?

According to Roy Adaptation Model (RAM), the cancer pain experience, and adaptation activities can be observed in four overlapping adaptive modes: physiologic, self-concept, role function and interdependence, and affected by stimulus from internal or external environment, thus relationship can show if there is a relationship or not. As illustrated in Figure 1, the four overlapping circles represent the four modes, since stimulus affecting one mode may also affect the other

three modes, and reflect that on its relationship.

In this study, the treatment regimen (e.g., chemotherapy, radiotherapy, and surgery) was viewed as a focal stimulus, the internal or external stimulus most immediately confronting the human system which leads to ineffective responses (fatigue, pain, vomiting, and nausea) for patients with cancer disease (Andrews & Roy, 1991). Contextual stimuli are all stimuli present in the situation that contribute to the effect of the focal stimulus which influence the person's response to cancer pain, which includes factors such as degree of illness, disability, social and financial support, etc. (Andrews & Roy, 1991). The residual stimulus is environmental factors within or without the human system with effects in the current situation that are unclear (Andrews & Roy, 1991).

Psychological factors play an important role in this stimulus such as fear from recurrence of cancer after remission, fear from complications of treatment plan, and anxiety from follow-up visit to hospital.

Relationship between Four Adaptive Modes and Pain Experience

(See Figure 1 opposite page)

The physiological mode deals with the needs of the person for physiologic integrity (Meleis, 1997). According to Andrews and Roy (1991), the physiological mode is related to the way the person responds as a physical being to stimuli from the environment. The physiological mode focuses on five basic physiological needs, which, hierarchically arranged, are oxygenation, nutrition, elimination, activity and rest, and protection (Andrews & Roy, 1991).

This study investigates the etiology and stage of cancer on the experience of pain as physiological variables based on the concepts of

RAM. In a study done by (17) it was reported that 48% with advanced stage cancer reported moderate to severe level of pain. Cancer patients with localized mass reported mild pain (14). No studies reported cancer sites and their relation to pain experience. The etiology of cancer pain was reported in a study done by Wang, et al (32) as 36% of cancer bone, 29% of visceral, and 24% of pleuritic, while, 39% had pain from multiple sites. No studies reported the relationship between the type of pain and pain severity. Thus, this study investigates the etiology of cancer pain and its relation to severity of pain.

The self-concept mode deals with the need for psychic integrity (Meleis, 1997). Self-concept is defined as “the composite of beliefs and feelings that a person holds about himself or herself at a given time” (Andrews & Roy, 1991, p. 16). Self-concept is formed from perceptions of self and others and directs one's behavior (Fawcett, 1995). In this study, the researcher investigates the intensity of pain as experienced by cancer patients. There were many tools used to assess pain intensity such as Brief Pain Inventory (BPI), Visual Analog Scale (VAS), and numeric pain scale. For the purpose of this study, the researcher used numeric pain scale to measure pain intensity (where 0 indicates no pain and 10 indicates worst pain). The study investigates the relationship of sensory mode (pain intensity) with the physiological mode (etiology and stage of cancer).

The role function mode deals with the need for social integrity (Meleis, 1997). Role function is “the need to know who one is in relation to others so that one can act (Andrews & Roy, 1991). Roles are regarded as the functioning units of society (Andrews, 1991). Each role exists in relation to another role. People need to know what roles they occupy and the related expectations about those roles so that they know how to act appropriately (Andrews, 1991). In this study, the researcher investigates the relationship of

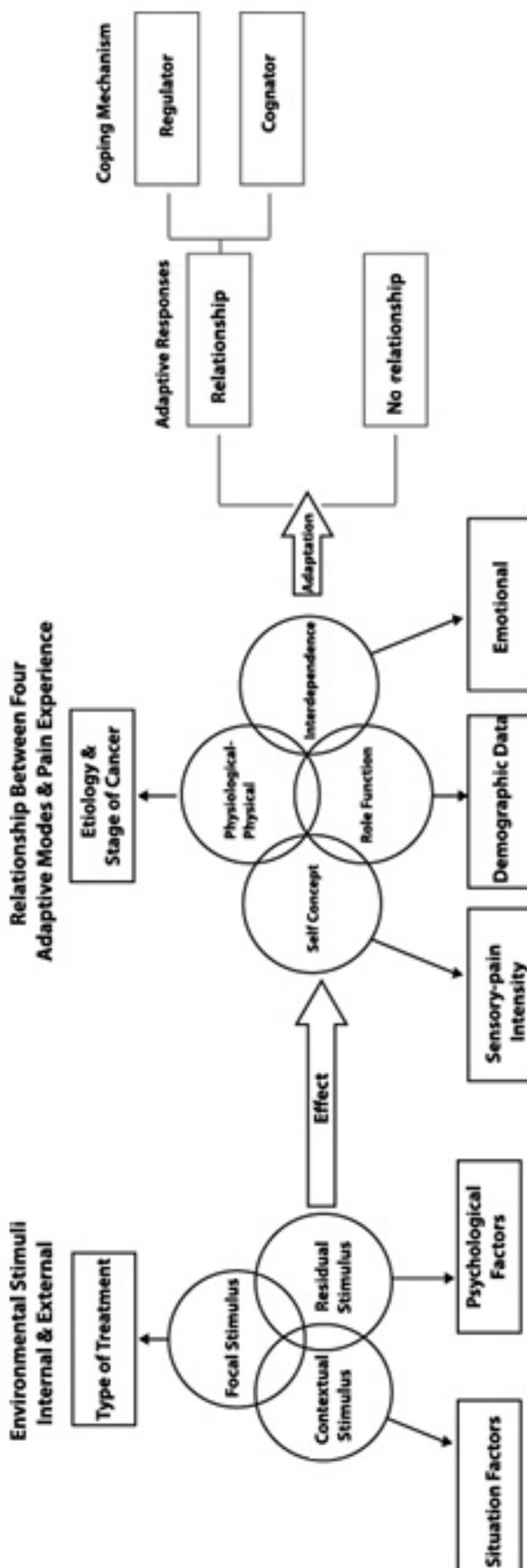


Figure 1: Relationship between Four Adaptive Modes and Pain Experience

demographic characteristics (age, gender and education) and religious beliefs on the intensity of pain as experienced by cancer patients, based on the interrelatedness between ROY's four adaptive modes.

The interdependence mode deals with the need for social integrity (Meleis, 1997). Interdependence is "a way of maintaining integrity that involves the willingness and ability to love, respect, and value others, and to accept and respond to love, respect, and value given by others" (Roy, 1987, p. 41). The researcher studied the effect of patient's mood, love, and respect by family and caregivers on the intensity of pain and adaptation level to pain. The researcher uses the BPI scale to assess these variables.

(See Table 1: The relationship between variables of pain experience and RAM concepts, next page)

Summary and Conclusion

When the nurses and health care professionals have an understanding of cancer related pain experience they can view the adaptation level by assessing the output of the system: the patient behavior and interaction with the environment. The cancer patients who are under treatment with chemotherapy and radiotherapy may experience a physical self-disruption such as fatigue, altered skin integrity, fluid and electrolyte imbalances and physical changes (hair loss).

This experience in physiological changes may influence the role function of the patient (social interaction with peers) and changes in the interdependence mode (family). If the family understands how to support the patient, the patient may have an integrated adaptation level. By understanding the relationships among self-concept, family functioning, functional status, and psychological adaptation, the nurse can identify the factors that lead to maladaptation, and supportive services can be implemented during the course of cancer treatment. According to Roy, it is the role of the nurse to promote adaptation in all four modes, enhancing the quality of life.

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Concept of Theory	Variables of Research	Theoretical Definition	Operational Definition
Physiologic mode	Physical: - etiology of cancer pain - Stage of cancer.	Causes of pain either by disease itself, treatment, or both <u>Stage of cancer:</u> measured by TNM classification system.	- The cause or origin of a pain as determined by subjective and objective data collected from the patient. - One of the four stages with the higher number representing the more advanced stage of the disease as reported by the treating physician.
Self-concept mode	Sensory: - pain intensity	An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of pain strength.	Pain Intensity measured by a numerical rating scale ranging from 0 to 10, with 0 being no pain, 1-3 being mild pain, 4-6 being moderate pain, and 7-9 being severe pain, with 10 being the worst pain (Clearly, 2000), as measured by the nurses documentation on the 24-Hour Patient Care Flow sheet.
Role function mode	Socio-cultural: age, gender, education, and religion	The intrinsic characteristics of patients and their role and beliefs.	Demographic variables derived from patient's reports
Interdependence mode	Emotional: love, respect	Achieve relational integrity by giving and receiving of love, respect through effective relations.	achieving relational integrity as stated by patients and families

Table 1: The relationship between variables of pain experience and RAM concepts

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A HOLISTIC APPROACH TO BEDSIDE TEACHING FROM THE VIEWS OF MAIN USERS

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Introduction

Bedside teaching includes any kind of training in the presence of the patient, regardless of the environment in which this training is presented. Several studies indicated that clinical teaching is an effective method of training and today it is used less than in the past, but students, patients, and faculty members strongly support this teaching method (Subha and 2003). In this way, clinical skills related to communication between doctor and patient, physical examination, clinical reasoning and obtaining specific skills of professionals will be learned better than classroom instruction methods (Williams, et al. 2008). Ramani and colleagues also expressed the benefits of clinical teaching as communication skills, clinical examination findings, teaching human aspects of clinical medicine and creating conditions to model professional behavior, so that these qualities cannot be shown effectively in the classroom (Ramani, et al. 2003).

Furthermore, the clinical teaching provides opportunities for teachers to observe students (El-Bagir and Ahmed 2002)(4). There is also evidence that suggests that these patients also enjoy this teaching method, because they gain a better understanding of the disease (Janick and Fletcher 2003)(5). In research conducted by Williams Kit and colleagues on four-year medical students and internal residents in first and second years in medicine school at Boston University, students believed that clinical teaching is valuable and necessary to learn clinical skills and expressed that this method is used less frequently and there are many obstacles in performing it, including lack of respect to the patient, time constraints, lack of attitude, knowledge and skills of the teachers, and also mentioned strategies for solving these problems (Williams, et al. 2008) (2)

Abstract

Introduction: Clinical education concerns with acquiring lots of skills and competencies that enable health professionals to function properly and provide services effectively. The aim of this study was to evaluate a holistic examination on bedside teaching from the views of its main users.

Materials and methods: This is a cross sectional study on 70 teachers (clinical and nursing), 70 students (medical and nursing), 400 patients in Jahrom University of Medical Sciences. Data gathering tool was a three-part questionnaire in which the first part was assigned to demographic data, the second part was 10 five-part questions aiming at investigating bedside teaching quality for teachers, students, and patients. Reliability was 0.83, 0.78, and 0.89 respectively.

Results: The results showed that teachers evaluated bedside teaching in three areas

of communication skills (50.4), proper clinical examination (44.4), and developing professional skills (44.4) more than other fields. Sharing some in common, the students also had a higher average in acquisition of professional skills (83.3) enhancing knowledge of students (82.3) and obtaining a suitable model of communication (72.3). The patients also considered factors such as high self-esteem, feeling of satisfaction (3.83), humanized health care (3.83), and transfer of information to both teachers and students (3.83) higher than other factors.

Conclusion: According to the results, it is necessary to appropriately train teachers to meet these standards, and while justifying students to implement this method and its benefits, patients' satisfaction, enhancing health care, and effective clinical governance should be provided.

Key words: Bedside teaching, Teachers, Students, Effectiveness

Ramani and colleagues conducted a study focused on four groups including senior assistants, skilled teachers in clinical teaching, faculty members of hospitals affiliated to Boston University and named the main obstacles as reduction of clinical teaching skills, and the fear of clinical teaching. They believed that teachers should be trained in almost all unreachable levels of clinical diagnosis and this puts them under a lot of pressure. They expressed that teaching is less important than research in the universities and teaching ethics is missing. Thus, they presented some strategies to eradicate these obstacles including: developing clinical teaching skills by teaching faculty members in clinical skills and teaching methods, ensuring that teachers possess great capabilities in clinical teaching, making a learning atmosphere to allow the teachers to accept their limitations, and eliminate low value of teaching in the departments with appropriate recognition and considering rewards for the successful teachers. In the present study, expert teachers and professors stated that the ethics of clinical teaching must be established on emphasizing the importance of using this method to get students to think clinically (Ramani, et al. 2003).

Aldeen and Gisoni also conducted a study on clinical teaching in emergency department and expressed that the emergency department is an ideal atmosphere for clinical teaching because of high volume of patients, high acuity and severity of diseases and pathologies that provide a variety of patient-centered educational opportunities (Aldeen and Gisoni 2006).

One of the major concerns of the clinical teachers is creating a learning-teaching approach to transfer learning which occurs in the teaching environment to the real and clinical environment. Since interaction between medical staff and patients is considered as an important fact in clinical work and is necessary for treatment process and

this interaction is in the presence of the patient, therefore, research and teaching strategies should be as close as possible to the real environment (Brien 2002). Clinical training mission is to train qualified students with necessary knowledge, attitudes, and skills, and to achieve this objective, standardized clinical training is an essential component of the educational programs, since approximately 50% of the teaching programs are dedicated to clinical works (Irma, et al. 2011). It is generally accepted that research methods should focus on beliefs, values, and behavior of teachers in the education system (Karimi Moonaghi et al 2010). But in recent years, research on teaching methods and their applications are more superficial and thus, deeper investigation is required (Heimlich and Norland 2002). Clinical teaching is a valuable method used by teachers despite their relative familiarity with it. Another notable point is failure to meet teaching standards in implementing this method and lack of appropriate use of it in clinical teaching. The aim of this study is to investigate quality and effectiveness of bedside teaching on students, teachers, and patients' points of views and determine constraints and challenges and propose strategies to remove them and finally, positive steps are taken to use these teaching methods more effectively.

Materials and Methodologies

This is a cross-sectional study to investigate the effectiveness of bedside teaching on teachers, medical students, and patients' attitudes in the hospital affiliated to Jahrom University of Medical Sciences. Cluster random sampling was carried out on medical students in various fields of medical sciences (medical and nursing students) and all nursing and clinical faculty. Approximate number of students in the two groups of medicine in three levels (externs - Interns) and nursing and training courses were 70. 50 teachers of different groups (nursing and medicine) participated in this study that performed clinical teaching for the students. In the

patients' group, in a two-month period, all patients who were present in bedside teaching numbered 400 and bedside teaching was carried out on them.

Approving the research proposal and obtaining approval of the research director, validity of the questionnaire was confirmed according to reliable sources (1, 3, 6), and then 10 expert professors confirmed it. Reliability in three sectors (teachers - students and patients) was proved with Cronbach's alpha by working on a pilot sample respectively (0.78- 0.83 and then 0.89). The questionnaires were given to students (doctors, nurses), patients and staff and then coded, collected, and analyzed using SPSS statistical software. It is worth mentioning that the questionnaires were designed by Likert method (never, to very high, 0-4) and in addition to demographic questions, 11 more questions were included which assess the effectiveness of clinical teaching from the viewpoints of masters, students, and patients. Data was analyzed using descriptive statistics such as mean, standard deviation, and Spearman and K2 test.

Inclusion criteria for the study were the interest of students, teachers and patients to participate in the study, as well as internship and performing bedside teaching by the teachers and exclusion criteria included illiterate patients, patients with somatic and psychiatric disability, patients in critical units because of the lack of accountability, patients where this method was not determined in their wards and patients in ambulatory wards.

Results

The results showed that the pattern of acquisition of good communication, training, performing physical exam, gaining professional skills and increased general information have a higher average. From the students' views, gaining professional skills and increasing students' general information and obtaining appropriate communicative plans have higher average.

Table 1: Mean score of bedside teaching quality from the perspective of both teachers and students

Questions	Students	Teachers
	Average and SD	Average and SD
Gaining a good communication model	4.50(0.54)	3.72(0.98)
Teaching clinical examination	3.72(0.98)	3.58(0.98)
Gaining professional skills	98(0.72.3)	3.83(0.92)
Increasing students' information	4.19(0.71)	3.82(1.02)
Increased students' information based on evidence-based medicine	3.61(0.79)	3.65(1)
Encourage information search and removing knowledge gaps due to not knowing the contents	3.67(0.96)	3.50(1.09)
Learning how to engage the patient in the treatment process of him/herself	3.57(0.97)	3.33(1.14)
The implementation of this method in all sectors including hospitals, clinics and operating rooms	3.50(1.01)	3.56(1.06)
Transfer maximum information in minimum time	3.48(0.95)	3.44(1.08)
Correct way to take history	4.01(0.85)	3.67(1.10)
Learning the exact methods of reporting and documentation of patient records	4.01(0.80)	3.57(1.17)

Table 2 (opposite page) shows that most students considered the quality of bedside teaching from moderate to high.

Additional results showed that there is a significant relationship between the effectiveness of bedside teaching and field of study (02/0 P = ,60/17 X2). But there is no relationship between age, sex, and method effectiveness. There is a significant relationship between viewpoints of both sexes on the effectiveness of bedside teaching (T= 3/87, P= 0.02). Other results showed that there is a significant difference among students in terms of fields of study.

Table 3: Mean differences in terms of effectiveness of bedside teaching based on field of study

Field	Average	Mean square	F	P
Nursing	51.39(6.9)	424.35	6.95	0.0001
Anesthesia	36.30(10.1)			
Operating room	38(2.1)			
Emergencies	25(1.2)			
Medicine	46.2(6.7)			

Table 2: Descriptive statistics of the effectiveness of bedside teaching from students' views

Questions	Very low	Low	Average	High	Very high
Gaining a good communication model	6(4.3)	5(3.6)	40(29)	57(41.3)	30(21.7)
Teaching clinical examination	6(4.4)	10(7.3)	41(29.9)	58(42.3)	22(16.1)
Gaining professional skills	6(4.3)	3(2.2)	27(19.6)	74(53.6)	28(20.3)
Increasing students' information	5(3.6)	8(5.8)	32(23.2)	54(39.1)	39(28.3)
Increased students' information based on evidence-based medicine	5(3.6)	11(8)	43(31.2)	47(34.1)	32(23.2)
Encourage information search and removing knowledge gaps due to not knowing the contents	7(5.1)	16(11.6)	44(31.9)	43(31.2)	28(20.3)
Learning how to engage the patient in the treatment process of him/herself	99(6.61)	23(16.9)	42(30.91)	38(27.9)	24(17.6)
The implementation of this method in all sectors including hospitals, clinics and operating rooms	8(5.8)	12(8.7)	37(26.8)	56(40.6)	25(18.1)
Transfer maximum information in minimum time	6(4.3)	20(14.5)	45(32.6)	41(29.7)	26(18.8)
Correct way to take history	9(6.5)	9(6.5)	32(23.2)	56(40.6)	32(23.2)
Learning the exact methods of reporting and documentation of patient records	11(8)	13(9.4)	31(22.5)	51(37)	32(23.2)

vs

Additional results related to the effectiveness of this method indicated that the majority of patients were in the age groups 60-51 years (25.3%) and the majority with 43.3% in wards, 52% men's internal ward, and 48% women's ward, and majority had primary education.

Table 4: shows that this method is most effective in raising self-esteem and feelings of patient satisfaction and cause medical care to become humanistic and useful information passes to students and the teachers.

Component	Mean	Min	Max
Increase patient awareness of the disease.	3.47(1.31)	1	5
Patient awareness of treatment	3.58(1.19)	1	5
Increasing patient participation in the treatment process.	3.65(1.24)	1	5
Humanized health care	3.77(1.19)	1	5
Increased self-esteem and satisfaction	3.78(1.22)	1	5
Convey useful information to teachers and students	3.76(1.22)	1	5

59.9% of the patients evaluated the bedside teaching as high and very high, 26.5% average, and only 3.3% low and very low.

Other results showed that the quality and effectiveness of this method are high, and very high from the viewpoints of patients. Other results showed that there is a significant relationship between age and education in terms of correlation between age and effectiveness of bedside teaching ($p = 0.008$, $r = 0.15$).

But there is no significant relationship between the effectiveness of bedside teaching in terms of sex, kind of disease, the ward, and the education.

Other results indicated that there is a significant relationship between patients' viewpoints of effectiveness of bedside teaching based on age ($F=2.47$, $P=0.03$). But as other cases show, it is suggested that the effectiveness of the method based on demographic variables was not significant.

Table 5: Difference of bedside teaching effectiveness based on demographic variables

Demographic Variables	States	Total square	Df	Mean square	F	P
Age	Within group	699.615	5	139.92	2/47	0.03
	Between group	15344.60		56.62		
Ward	Within group	141.48	3	47.16	0.81	0.48
	Between group	15902.73		58.25		
Disease	Within group	81.22	2	40.61	0.69	0/49
	Between group	15963		58.25		
Education	Within group	413.38	3	137.79	2.40	0.06
	Between group	15630.83		57.25		

Discussion

The results show that obtaining a good communicative pattern, appropriate teaching, clinical examination, acquisition of professional skills and increasing students' scientific information on the viewpoints of teachers have a higher average.

In another study conducted to investigate the experiences of advisor faculties and fourth-year students of medicine in a qualitative study on bedside teaching of medical students and advisor faculties, advisor faculties were under pressure considering time spent over other commitments, despite enjoying this approach. The results showed that all of the teaching strategies used by the teachers were not welcomed with great enthusiasm by the students. Students considered the teachers as an educational model (Stark 2003a).

In a study conducted by Celenza, Rogers, with the aim of investigating the effectiveness of bedside teaching on patient care with a 6-month perspective study in emergency department, people stated that the most common lesson they took from this method was skills in history taking and physical examination and cited clinical reasoning as the most important lessons learned from this approach (Celenza and Rogers 2006).

Studies conducted by Gonzalo et al on 51 local residents and 102 medical students from educational rounds and bedside teaching revealed that time spent in clinical practice for the learners to learn bedside teaching is very important for professional development and that this method is preferred by the learners compared with other methods of bedside teaching training (Gonzalo, et al. 2009).

In another study, hospitalists spent an average of 101 minutes on teaching rounds and an average of 17 minutes inside patient rooms or 17% of their teaching time at the bedside. This study showed rounds that included time spent at the bedside were longer on average than rounds that did not include time spent at the bedside (Crumlish, et al. 2009).

In research conducted on 27 patient attendants, 22 patients, and 21 residents, the attendants expressed their satisfaction with bedside teaching and presented a case report in a conference room in a linear range. 96 versus 92 out of 100 linear parts, expressed their preferences with bedside teaching (95 vs. 15), and comfort (89 vs. 19) in this range. But there was no significant difference in residents' satisfaction and comfort in applying this method. These people were more comfortable in asking questions (84 vs. 69), having the art

of asking questions (85 vs. 67) in the conference room. This study showed that 81% of patients' attendants wished that the next examination was with their patient.

Evidence shows that bedside teaching includes 61% of clinical training and performed examinations. This method takes more time than the typical round (Landry, et al. 2007).

A study conducted to evaluate this educational method and its impacts on the attitudes of students and patients, revealed that although there is a slight difference among some students, to present the contents away from the patient's bedside, students expressed that students learned more about diagnosing and staying by the patients' bedside at the time of bedside teaching. But students' knowledge of mechanism of diseases was lower than presentation out of clinical wards (Rogers, et al. 2003).

In a study conducted on 108 patients and 142 fourth-year medical students at Washington University, students and patients preferred bedside teaching as a teaching method; patients more easily communicate with doctors and talked about their health issues.

Also, two groups of patients and students benefited more from participating in bedside teaching (17).

In another study aiming at examining viewpoints of internal residents and medical students, it became clear that this approach is effective in developing skills such as history taking 55%, physical examination skills (89%) professional 72%, physician-patient communication skills 83%, differential diagnosis 43%, and patients' management 59% (Jed, et al. 2009).

Some evidence states that outcome of this method is dependent on 1) the value of peer assessment in a group,

(2) variety of teaching strategies, (3) the opportunities to provide feedback to learners, (4) the art of asking questions effectively, and (5) the possible relationship between a teacher's skills and successful bedside teaching (Beckman 2004).

In another study the importance of peer assessment was investigated and the benefits such as high value of using peer assessment, applying an unlimited number of teaching strategies, applying this method to revive missed opportunities, the art of asking question effectively, and the relationship of teacher maturity and bedside teaching were emphasized. The results of this study are the same with the abovementioned results considering bedside teaching approach so that the development of communication skills, performing proper clinical examination, and improvement of professional skills, were expressed as the most important results regarding the quality of this method.

The results also showed that all of the teaching strategies used by teachers in this method may not be welcomed by the students. And, despite the fact that students and teachers are partners in education, general agreement about the quality, quantity and clinical teaching may fail to be materialized considering appropriate clinical teaching (Stark 2003b).

In the present study, despite acceptable reported quality of bedside teaching and its clinical aspects (moderate to high) which indicates the relative familiarity and acceptable application of this educational method, lack of time is considered as an obstacle to applying this technique.

The positive effects of this method can be noted as numerous roles of the clinical teachers including, actor, director, audience, passive, and listener. Also, in presenting this method, the patients undergo less passive roles and mere audience (Lynn 2009). This can justify the

obtained results regarding patients' satisfaction and their consent to participate in this educational method.

Also, the positive effects of this method on patients' participation in health care plans and changing their positions due to participation can be noted as an advantage of this method. However, no negative impact on patients' care was found. The results of this study are consistent with the results presented in the following study (Celenza and Rogers 2006). Other advantages of this method may include opportunities to gather additional information, direct observation of learners' performance, humanizing care for patients, non-judgmental language, improving patients understanding of their disease and feeling active on the side of patient (Janicik and Fletcher 2003). All of these outcomes justify patient satisfaction with the use of this method.

Given the quality of the bedside teaching provided by main users of this educational method, it is necessary to consider different approaches and strategies such as clinical skills, teaching methodologies by the teachers, ensuring the application of this method aiming at understanding these points to rely on their knowledge and skills, creating a learning environment that allows teachers to become aware of their limitations and examine their capabilities, sufficient reward for the efforts of the teachers, and emphasis on the revival of ethics in bedside teaching (Ramani, et al. 2003).

Among other strategies to reduce barriers examining the clinical setting, are addressing time constraints by adopting a flexible training program, proper patient selection, ensuring the learners, improve learner autonomy in the teaching process, and developing evidence-based education. (Keith, et al. 2008).

Conclusion

Considering the importance of bedside teaching method and regarding the good views of the teachers, patients, and middle and high students' views, it is necessary to provide training classes to develop teachers' capabilities, justify the students and mention its benefits, and to pave the way to use this method appropriately. Also, using this method considering the positive and appropriate patients' views, can provide a holistic analysis of health care and improve health and to provide effective implementation of clinical governance.

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THE BLENDED EDUCATIONAL PROGRAM AS A MODIFIED EDUCATIONAL PROGRAM IN MEDICAL EDUCATION AND THE EFFECT ON STUDENTS' CRITICAL THINKING

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Introduction

One of the most important challenges of education in the twenty-first century is how to train students in having necessary readiness for confronting the changing society and complexities of the information explosion age. "In addition, the professional world asks the universities to provide formative opportunities that train students to fulfill their roles as working professionals," (Ugarte & Naval, 2008).

Today, teaching and learning are mostly supported by digital material and electronic communication. At present, Web-based learning (WBL), problem-based learning (PBL), and collaborative learning are the most powerful educational options in higher education. New teaching methods and especially electronic learning is on the top of the educational curriculums of all countries and mainly the advanced countries. (Henrich & Sieber, 2009; Taradi, Taradi, Radic, & Pokrajac, 2005).

New pedagogical paradigm is replacing the classical system with its unique characters (Gerreson & Anderson, 2003; Brower, Dejonge, & Stout, 2004). Therefore, it gives priority to using some techniques which can develop maximum learning for the students and provide a deeper learning by using the benefits of both conventional and new methods.

In order to respond to these requirements, blended learning has become increasingly popular and is particularly suitable to the process of transitioning towards E-learning from classical forms of teaching. (Hoic, Mornar, & Boticki, 2009).

Abstract

Introduction: Blended learning is a mixture of various learning strategies and delivery methods to optimize the learning experience of the users.

Objectives: The objective of this study was to compare a designed blended educational method with classical face to face method in the cognitive effect of the program on the students' critical thinking.

Methods: A comparative study was conducted on 41 first year nursing students of Jahrom University of Medical Sciences who participated in the psychiatry course in 2008–2009. The students were randomly divided into two groups of conventional and blended educational methods. The Watson Glazer test was used for assessment of critical thinking.

Results: There was a significant increase in student's critical thinking skills in both groups after conducting of the course. Analysis of variance results showed that there was a significant relationship between students' final score, teaching method and critical thinking in conclusion skills. The mean of final scores of the students who participated in the blended educational group was significantly more than that of those who participated in the face to face teaching approach.

Conclusion: The use of blended educational method is recommended for teaching in Medical and Para-medical sciences.

Key words: Face to face education, Critical thinking, Educational Psychology, Active Learning, Computer Uses in Education, Academic achievement

Blended educational method has been widely studied and its mechanisms explained by different research (Valiathan, 2002; Harvey, 2003; Allison, Felicia, & Rebecca, 2008; Michael & Renate, 2003; Rossett, 2003). The available evidence demonstrated that blended learning is better than conventional methods and the E-learning technology and is not only able to transfer information more efficiently but it is also a more effective pedagogical method (Alvarez, 2008).

Much research has been accomplished on the effects of blended education learning on the various aspects of Students' learning, so that some research reflects a combination of both traditional learning (face to face) and electronic learning has influence on student's learning. For example, Reynold maintains that the advantage of using blended education learning especially electronic learning for training dentists is their deep understanding of subjects, so that most students preferred the blended education learning to the conventional learning and they consider the blended education learning as a successful experiment for themselves (Chamberlain & Reynolds, 2007).

Valiathan considers the blended education teaching as a very successful method for teaching anatomy and they think that it is more effective than the traditional teaching (Valiathan, 2002).

Some researchers remarked that the blended education learning derives its success from the acquaintance of students with electronic learning and participatory and collaborative learning in which both hardware and software topics are of great importance and pedagogical bases are ready for using it (Oh & Park, 2009). This method could decrease the gap between theoretical and practical subjects (Sung, Kwon, & Ryu, 2008). Others showed that electronic learning as a supporter of traditional learning could play a role in bolstering the learning of students (Kay, 2006).

Others demonstrated the achievements of the electronic learning of the students in instructing medical sciences. They found that some considered this kind of learning as effective, and others thought that it was not effective because of its maladjustment with their learning methods (Watson & Glaser, 1998).

One research on instructing on medicines for knowledge advancement, one's self-efficiency and its practical use in the clinical skills showed that information and knowledge of nurses increased remarkably, but this issue didn't have any significant effects on self-efficiency and practical use in the clinical skills (Magnusen, 2000).

Key, 2006 applied it to the students taking the unit of physiology. Their research showed that there were not any significant differences between the final scores of students in both traditional and blended education groups; the blended education learning could help students deepen their perceptions of subjects and increase their understanding of practical units in the laboratory. This issue was found by evaluating the relationship between students' practical scores and degree of their learning through blended education learning (Kay, 2006).

Owing to the rapid evolution of science and knowledge in different fields, it is possible to present effective teaching through new methods providing deep and fast learning.

Considering medical courses are an integration of theoretical and practical parts and psychomotor domain it is of great importance because working in the clinical environment, it is necessary to have regard for electronic learning through novel and different methods. Also concerning the positive aspects underlined in different research and lack of studies about its cognitive effects between research accomplished inside and outside of the country, we evaluate these

effects and use the aforementioned pedagogical methods to make a teaching culture and deepen learning of students and introduce unknown effects and aspects of this kind of teaching and plan the path of future research in other fields.

We hope this research can provide a dynamic ground for studying the pedagogical research in the field of medical sciences and also the results of this research can be used by our researchers for attaining a better education.

Methods

A comparative study was conducted among 41 nursing students of Jahrom Medical Sciences medical school who participated in the course of psychiatry in the academic year 2008 -2009.

Blended learning is a novel method, based on the conventional and electronic methods of teaching. We considered the organization of the class to encourage critical thinking to attain a balance between the content and the process of education, between lecture and interaction, create discussion in the class and use a student center in learning via assignments and educational projects.

In the conventional method, we used the common methods of lecture and face to face education during the term. In the blended group we used the standard educational designed models and the educational process was started using lectures and face to face education; this procedure was maintained by the aid of active teaching and learning while venturing to e-learning, electronic self - learning and Asynchronous virtual learning as personal or collaborative projects.

To design this research, the students were randomly divided into two 20 and 21 member groups according to their students' numbers and orienting the empirical groups to reduce resistance to involvement in active education, we used face to face education to present the basic

Face-to-face tutorials based on active learning	12 x 2 hours
Researching, reading, planning, designing ideas	Over 10 weeks
Online reflective journal entries	1 per week x 12 weeks
Asynchronous discussions	3 per week x 12 weeks
Evaluation	12 week

Table 1: Activities in the blended model

principles and it was maintained by active educational techniques such as PBL, scenario, writing simulation, group discussion and role playing (12 two hour weeks). Then it was maintained by asynchronized electronic education such as self-elearning via digital libraries and scientific sources, presenting abstracts of scientific essays from the latest relevant sources by the student (12 two hour weeks, the last 15 each of session). Students contacted with the teacher by email (during the term and before each session), and using educational films and CDs.

In the other group we used other usual teacher-centered methods and for preventing the impression of selection and abiding to the ethics of education, we gave an extract of the material presented by the empirical group to the students who received traditional education after the final exam.

We also explained to respective groups at this time how to use the electronic sources. Students in both groups were randomly distributed and the midterm and final exams were taught identically. In educational designing of the research we considered the standard educational design and the following steps for designing and practicing blended education. These steps consisted of assuring the learner preparation (justification of education type), presenting the material (using active educational strategies mixed with online education), displaying the working mechanism (searching sources and digital libraries' systems supporting the student's learning), practice (giving feedback), evaluation, (comparative, summative, individual and group conferences and presenting scientific essays),

providing support (access to online system and professional service for digital sources), and supervising the student learning and sustaining communication with emails and cooperation in learning (Kay, 2006).

The test used in this research was a normalized version of Watson Glaser Critical Thinking Test, which contains eighty general questions in five parts: comprehension skill, recognition of pre-assumptions, conclusion skill, interpretation, and evaluation skill (Magnusen, 2000; Watson & Glaser, 1998). This test was normalized in Iranian society (Islami, Shekarabi, Behbahani, & Jamshidi, 2004). The students were examined pre and post test, and their academic achievements were measured by comparing the scores of the two groups.

The difference between the score of critical thinking in pretest and posttest was studied by a quantitative evaluation so that the scores below 54, the scores between 55- 60 , and the scores between 61 - 80 were considered as weak, average, and strong respectively (Magnusen, 2000).

A qualitative analysis was performed to investigate the degree of students' satisfaction by open questionnaire. As a normal distribution of variable , we used Paired t-test to compare mean scores in the pretest and posttest result; student t-test was used to compare the differences of mean scores in the two groups of traditional and blended teaching and chi-square and analysis of variance to assess interaction between variables.

Results

Through the qualitative study by open questionnaire, we evaluated students' satisfaction in the two groups. Students who were in the blended educational group 20 (93.8%) were satisfied with this kind of teaching. They believed that this kind of teaching approach could provide in-depth learning, improve their knowledge (n=19), facilitate access to the essential sources (n=13), and provide more self-learning (n=16). They also mentioned that it was a user-friendly method (n= 8). Also (83.7%) of the conventional group were satisfied with teaching, but there were no significant differences between them.

Table 1 illustrates that the mean scores of critical thinking skills changed in both groups. However the mean of scores of the evaluation factor decreased in both groups, with more decrease in the conventional group.

The result of Paired t-test in blended groups shows that there is a significant difference between perception skills ($P = 0.005$).

Conventional group pre test and post test showed a significant relationship between means of data in recognition of pre-assumptions, conclusion and interpretation. Mean of evaluation score decreased significantly in the posttest. (10.68 ± 1.70 in pretest vs. 80.06 ± 1.43 in post-test) ($p = 0.001$). (Table 2 - top pf next page)

Moreover, the student t-test didn't show any significant differences between the mean of critical thinking skills in both educational groups. It clarified that both kinds of teaching played the same role in the

Critical thinking	Blended group				Traditional group			
	Before	After	T	P	Before	After	T	P
Perception	3.44±1.58	5.61±2.19	3.19	0.005	5.31±2.21	5.06±1.98	3.41	0.73
Recognition of Pre-assumption	9.57±2.34	10.21±1.35	1.10	0.28	8.31±2.28	10.06±2.07	2.50	0.02
Conclusion	10.11±3.08	10.27±1.52	1.83	0.85	9.18±2.42	10.93±1.48	2.28	0.003
Interpretation	9.36±2.19	9.84±1.16	0.67	0.50	7.43±2.22	10±1.75	401	0.001
Evaluation	9.78±2.04	9.05±3.32	0.64	0.46	10.68±1.70	8.06±1.43	4.11	0.001

Table 2: The Mean Score Of Critical Thinking Skills before and after Education in the Two Groups

improvement of students' critical thinking. Mean of perception, recognition of assumption and evaluation in the blended group was higher than the other group. Table 3.

Critical thinking skills	Conventional	Blended	T	P
Perception	5.31±2.21	5.61±2.19	0.39	0.69
Recognition of assumption	10.06±2.01	10.21±7.32	0.258	0.79
Conclusion	10.93±1.48	10.26±1.48	0.16	1.34
Interpretation	10±1.75	9.86±1.16	0.318	0.75
Evaluation	8.06±1.43	9.05±3.32	1.10	0.25

Table 3 : Differences Between Mean Of Critical Thinking skills In the Two Groups

As a scoring of test we consider the scores below 54, the scores between 55- 60, and the scores between 61 - 80 were considered as weak, average and strong respectively. (22)

The difference between score of critical thinking in the pretest and posttest showed that the difference of means was significant in the blended education group (4).

Educational group	Before	After	T	P
Blended group	41.51 ± 6.10	44.96 ± 5.61	2.45	.002
Classical group	42.29 ± 5.69	45.52 ± 5.88	1.53	154

Table 4 : Differences Total Critical Thinking in the two Groups Before And After Teaching

Analysis of variance results showed that there was a significant relationship between students' final score , teaching method and critical thinking in conclusion skill. (Table 5).

Dependent variable	Critical thinking skills	Source	Mean	DF	Sum of square	F	P
Student final score	Perception	Group	5.79	16	5.79	1.18	0.19
		Group & skill	4.84		29.09	0.53	0.22
	Interpretation	Group	10.1	1	10.7	2.22	0.14
		Group & skill	2.12	4	4.49	0.24	0.90
	Conclusion	Group	20.49	1	20.49	4.8	0.03
		Group & skill	0.51	5	2.58	0.12	0.04
	Recognition of pre-assumption	Group	15.76	1	15.76	4.01	0.057
		Group & skill	6.33	4	25.34	1.61	0.20
	Evaluation	Group	8.91	1	8.91	2.87	0.10
		Group & skill	8.19	5	40.94	2.64	0.58

Table 5 : The Effect Of Education On Student Critical Thinking By Analysis of variance

We used chi square test to compare the strength of critical thinking in educational groups after teaching. These results revealed that there was significant differences between the evaluation skills in the two educational groups. ($\chi^2=0.04$, $p=0.03$). As a result students who received blended learning 'were significantly stronger' than those in the conventional group in evaluation skills.

There was a significant difference in the final score of students' in the conventional and blended groups; blended teaching had more effects on the improvement of students' final scores.(Table 6)

Student's final score	Mean	T	P
Blended group	15.67(1.65)	3.06	0.004
Classical group	13.88(2.06)		

Table 6 : Difference of Final Score in Educational Groups

Discussion

The result finding of this study showed that 93.8% of blended group and 83.7% of conventional group were satisfied with the teaching method. Some research states that most teachers have a positive attitude towards blended instruction as they believed it played a role in improving the quality of their instruction (Kay, 2006 ; So & Brush, 2008). Others stated that most of students have a positive perception and satisfaction toward blended learning so that this method effects student self regulation, student perceptions of collaborative learning, social presence and critical factors (So & Brush, 2008; Kim, Bonk, & Teng, 2009). However some research revealed that the perceived communication, collaboration, and satisfaction levels of students in blended learning varies according to their levels of computer and Internet literacy(Rossignol, 1997).

The results of investigations confirm the present research and affirms the impact of blended learning on the students' attitudes and satisfaction.

Conventional teaching also had a positive effect on students' satisfaction and improved critical thinking skills of students in the present research. Much evidence revealed that lecturing and teacher centered method is more effective in presenting the background and introduction to a topic or

issue.(Owens & Walden, 2001) The impact of conventional method on students' critical thinking may be related to students' tendency toward teacher-centered learning and provision of reliable information by teachers that leads to the promotion of critical thinking skills.

This study revealed that blended educational method has an effect on improving critical thinking skills; a similar finding was reported from other studies (Marinick, 2006; Tiwari & Lai, 2006; Gokhale, 2006; Staib, 2003; Badawi, 2009; Campbell, Gibson, & Hall, 2008). Others reported the positive effect of blended learning in developing prospective pedagogical knowledge and performance (Mongust, Fabregas, & Delgado, 2000).

This study did not find any significant difference in students' critical thinking in blended method and conventional method. This finding was in agreement with a similar finding (Rossignol, 1997).

Furthermore, the results showed that the blended teaching had more effects on student learning. This may be due to the identified relation between web-centered teaching based on problem solving skills, self directed learning and improvement in students' attitudes about learning (Taradi et al., 2005; Campbell et al., 2008; (Delialioglu & Yidirim, 2009). This result agrees with the present result, and confirms educational

effects of blended learning on cognitive aspects of students.

This research also showed that we can profit by the integration of conventional and electronic methods as a synergic effect to increase students' satisfaction and provide deepened learning, self directed learning and self monitoring. This integration in turn effects students' learning, critical thinking and academic achievement in a positive way.

As a limitation to the present research we can point to the lack of electronic infrastructures and unfamiliarity of teachers with new strategies especially for electronic learning; we need more information about effectiveness of this method by further research. We need also greater responsibility and commitment on the part of higher education managers in order to provide electronic infrastructures to assess the application of this novel method in our country.

Conclusion

The study showed the positive effect of blended learning method on learning, critical thinking and satisfaction from teaching- learning strategies. Therefore the use of blended educational method is recommended for teaching in Medical and Para-medical sciences.

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