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This is the first issue this year and we are looking for further growth of the journal which has stimulated research in the area of nursing and scholarly work in this area.

Our Middle East readership and academic survey (see "Middle East Reader and Academic Survey 2011-2012") has shown the ME-JN to be the second highest read journal in the region (after the MEJFM), indicating a great need for nursing related articles.

A paper from Kuwait assessed students' knowledge of microbiology with a view to improving the course content for nursing programs. The authors stressed that microbiology curriculum in pre-registration nursing programs varies in different countries and institutions. They used an anonymous questionnaire which was administered to 330 nursing students and 14 faculty members. Students in the Bachelor of Science in Nursing (BSN) program generally had higher mean scores than those in the Associate Degree in Nursing (ADN). The authors concluded that areas of pathogenicity and epidemiology require more emphasis in the nursing microbiology curriculum.

Another paper from Saudi Arabia used a qualitative study design and semi structured interviews, explored the nurses' experiences of providing palliative care for critically ill patients in an intensive care unit in Saudi Arabia

The authors stressed that in Saudi Arabia the majority of deaths occur in the hospitals. However, there are a few palliative care programs available to meet patients and families' needs. Six themes were identified and all themes reflect different nurses' experiences when they provide palliative care for critically ill patients in the ICU. The authors concluded that communication was a barrier when non-Arabic speaking nurses provide palliative care for critically ill patients and their families. The authors recommended hospital management to increase the number of Arabic-speaking nurses and to provide more translators in day shifts.

A paper from Bangladesh looked at Determinants of Fertility Behaviour among Adolescent Reproductive Women in Bangladesh. The challenges and risks the young people face during this period impact directly on their physical and emotional mental wellbeing. The authors used multivariate analysis such as multiple classification analysis which has been used to identify the important determinants of children ever born. The study result shows that various socio-economic and demographic variables affect on adolescent's fertility. These are adolescent's education, place of residence, religion, working status, breast feeding etc. An inverse relation is found between age at marriage, and fertility. Result shows that fertility is highest in rural areas than that of urban areas.

A descriptive paper from Mohaiel hospital looked at Pregnant Women's Awareness regarding Viral Hepatitis B and C . The author found that out of 126 women only 34.9% had satisfactory knowledge about HBV and HCV. Misconceptions regarding HCV and HBV were very common among the study sample that 59.5% , 57.9%, 45.2% respectively consider family genetics, general toilets in markets and foods, as risk factors for infection.

The study findings reflect that there is unsatisfactory knowledge regarding HBV and HCV among women in the reproductive years. More efforts must be focused on correcting women's misconceptions and educating them in healthy behaviors through educational programs.

A paper from Jordan looked at subjectivity in quantitative nursing research. The authors stressed that the credibility of research is important for its consumption. Debates still exist between supporters of different paradigms as they disagree on what makes research credible, what makes it valid and to what extent, and which methodology is more appropriate. This paper presents a comparative view of credibility between quantitative and qualitative paradigms by exploring the issues of subjectivity and objectivity in its methodologies.

ASSESSING STUDENT NURSES' KNOWLEDGE OF MICROBIOLOGY FOR COURSE CONTENT IMPROVEMENT

Abstract

Background: Microbiology curriculum in pre-registration nursing programs varies in different countries and institutions. Thus, making a decision on the course content can be a challenge, especially in a new institution.

Objective: To assess students' knowledge of microbiology with a view to improving the course content for nursing programs.

Methods: An anonymous questionnaire was administered to 330 nursing students and 14 faculty members. The questionnaire contained 10 questions on each subject area of microbiology - infection control, immunity, epidemiology and pathogenicity, with answers on a three-point Likert scale. Descriptive statistics, t-test and ANOVA were used to determine the significance of the differences between scores by different programs, levels of enrollment and gender.

Results: Students in Bachelor of Science in Nursing (BSN) program generally had higher mean scores than those in Associate Degree in Nursing (ADN). Students' mean scores increased with level of enrollment. Female students had significantly higher mean scores in pathogenicity than males (p= 0.018). For all respondents, knowledge of microbiology was highest in immunity and infection control and least in pathogenicity and epidemiology.

Conclusion: Areas of pathogenicity and epidemiology require more emphasis in the nursing microbiology curriculum.

Keywords: Nursing, knowledge, microbiology course content, curriculum

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Introduction

Microbiology is one of the biological science courses required by nursing institutions; however, the microbiology course content varies from one institution to another (Goetz et al., 1992; Choe & Shin, 1999). Goetz (1992) reported that 49 percent of nursing institutions in the USA required students to take a microbiology course before clinical experience; some institutions offered only infection control and immunization as their microbiology course content. However, Reynolds (2006) felt that infection control, transmission of diseases and epidemiology are areas that should be included in the microbiology course for nurses. Knowledge of these areas could reduce occupational risk of nursing students, as was reported by Atulomah & Oladepo (2002). In a study by Davis (2010) in the UK, nursing students reported that the bioscience content of their pre-registration nursing education was inadequate.

The present study assessed students' knowledge of four subject areas of microbiology- infection control, immunity, epidemiology and pathogenicity. The results will be helpful in determining the areas requiring improvement so as to enhance nursing students' knowledge of microbiology.

Review of Literature

Biosciences taught in pre-registration nursing programs include anatomy, physiology, biochemistry and microbiology. Henderson (2000) reported that the Georgia Board of Nursing in the USA, mandated that nursing curricula should contain natural sciences, including microbiology. Reynolds (2006) reported the importance of microbiology to nursing students. Literature indicates poor performance of students in biosciences, including microbiology (Jordan et al., 1999; Davis, 2010). Wong &Wong (1999) observed that performance in biosciences together with grade point average of nursing courses in years 3 and 4 contributed significantly to student success in the nursing program ($p<0.001$). Furthermore, Campbell & Dickson (1996) reported that grade point averages in nursing and science courses were the greatest cognitive predictors of NCLEX-RN examination success. In addition, performance in microbiology was associated with the score in the final examination as well as the professional licensure examinations.

Knowledge of microbiology is essential for the understanding of the pathogenesis of infectious diseases and infection control. Atulomah & Oladepo (2002) in Nigeria attributed occupational risks from HIV/AIDS among nursing and midwifery students to poor knowledge of microbiology. Similarly, Denny-Smith et al. (2006) reported that female nursing students' inadequate knowledge of microbiology put them at risk of human papillomavirus and cervical cancer. Thus, Trnobranski (1993) stressed the need for nurses to understand disease processes sufficiently to practice safely.

Kyriacos et al. (2005) suggested that the curriculum content of microbiology must equip nurses in developing countries, such as South Africa, to meet their expanding roles as leaders in health care clinics. In fact, doctors and service users expect of nurses a higher level of knowledge of biosciences than they actually have (Davis, 2010). Staff nurses have been reported to express lack of confidence in articulating their knowledge to patients and other health professionals (Courtenay, 1991; Clancy et al., 2000).

As the knowledge of the various areas of microbiology impact differently on clinical practice, it is of interest to evaluate students' performance in the various areas of the subject.

Aim

The aim of this study was to assess students' knowledge of microbiology with a view to improving the course content for pre- registration nursing programs.

Definition of terms

Course content in this study refers to four subject areas of microbiology, namely: infection control, immunity, epidemiology and pathogenicity.

Study setting

The College of Nursing is the only institution, in Kuwait, admitting high school graduates for nursing training (Al-Kandari et al., 2009). Established by decree in November, 2002, the College offers two programs: Bachelor of Science in Nursing (BSN) which runs for four years and Associate Degree in Nursing (ADN) that has five levels each being one semester of four months. Microbiology is compulsory for the nursing programs so, there is need for enhancement of students' knowledge.

Previous reports have focused on the relevance of basic sciences to nursing practice, or as a predictor of success in nursing programs. There appears to be few studies on nursing students' knowledge of microbiology as a basis for evaluation of microbiology course content. The aim of this study was, therefore, to assess the knowledge of microbiology among nursing students in the ADN and BSN programs against a standard score by registered nurses who were clinical teachers in the College of Nursing.

Methods

Ethical approval

Approval for this research project was given by the Research Committees of the College of Nursing and the Public Authority for Applied Education and Training (PAAET), Kuwait. Ethical considerations were given in the use of human subjects and their informed consent. The purpose of the study was described in writing and also explained to all the students before distribution of the questionnaire to those willing to participate. Their consent was expressed by their responding to the questionnaire.

Questionnaire

The instrument for the research study was an anonymous questionnaire.

The first section of the questionnaire dealt with demographic information on nationality, gender, college program, level of enrollment, and if respondent had previously studied microbiology. The second section comprised ten questions on each of four subject areas of microbiology namely; infection control, immunity, epidemiology and pathogenicity. Answers were on a three -point Likert scale of: I agree, I do not know, and I disagree.

Procedure

An anonymous self-administered questionnaire was distributed to nursing students in a classroom setting, under the supervision of a faculty member who explained the objectives of the research study and the anonymity of the questionnaire. Participation meant consent. The supervisor ensured that individual responses were given to the questionnaire.

Validity

The content validity of the questionnaire was assessed by four faculty members - two registered nurses and two biomedical scientists.

Pilot study

Twenty-five students were given the questionnaire before the main research study. Their responses were used to test the suitability of the questions and feasibility of the research methods.

Reliability

To test the reliability of the responses, one week after completion of the questionnaire, 10 of the students were given new copies of the questionnaire to repeat. The test retest responses given to the questionnaire were compared, giving a result of 0.86.

Statistical analysis

Descriptive statistics were carried out to determine the percentages, means, and standard deviations of the scores. T-test and ANOVA were used to determine significance of the differences between mean scores by different groups at 95 percent confidence interval.

Knowledge was assessed as the correct responses to the questions.

Results

Demographic data

There were 330 students and 14 teachers who responded to the questionnaire. Of the students, 97 percent were Arabs, and the remainder non-Arabs. Altogether, 278 students (84 percent) were in the Associate Degree in Nursing (ADN) program, while 52 students (16 percent) were in the Bachelor of Science in Nursing (BSN) program. The number of students who had not studied microbiology previously, decreased as the level of enrollment increased. Only 10 percent of students in BSN program had not studied microbiology before their enrollment.

The response rate to the questionnaire was 95.1 percent for

Subject Area Infection Control: Level (L)	Males n=85	Females n=193	p-value
L1	44.6+/- 24.2	53.6+/- 23.6	0.408
L2	45.5+/-24.5	38.5+/-17.4	0.487
L3	50.0+/-33.1	57.0+/-23.7	0.595
L4	58.0+/-27.0	59.4+/-21.8	0.898
L5	50.0+/-23.6	64.2+/-26.4	0.219
Immunity:			
L1	34.2+/-18.0	48.9+/-16.9	0.075
L2	47.3+/-22.1	44.6+/-20.5	0.781
L3	71.4+/-24.5	68.9+/-16.4	0.795
L4	58.0+/-27.0	75.5+/-15.3	0.092
L5	70.0+/-25.8	72.9+/-23.0	0.794
Epidemiology:			
L1	28.9+/-12.1	39.6+/-11.5	0.058
L2	31.2+/-11.6	32.7+/-16.1	0.811
L3	48.1+/-24.9	43.2+/-22.5	0.647
L4	46.0+/-20.1	52.9+/-19.6	0.445
L5	50.0+/-33.3	51.8+/-22.9	0.888
Pathogenicity:			
L1	24.7+/-8.4	34.4+/-8.4	0.018
L2	31.0+/-10.7	32.1+/-11.4	0.823
L3	33.1+/-24.1	46.5+/-19.5	0.189
L4	24.1+/-11.6	56.8+/-17.3	0.001
L5	60.0+/-39.4	51.5+/-24.8	0.571

Table 1. Mean scores (SD) for male and female students in 10 questions of each subject area according to levels of enrollment (L) in ADN

students, 93.3 percent for teachers and 95 percent overall.

Mean scores by male and female students at different levels of enrollment (Table 1).

Table 1 shows the mean scores of male and female respondents in each subject area according to their level of enrollment. Generally, mean scores increased with level. However, in ADN at level 2, females had lower mean scores than level 1. Overall, female students had higher mean scores than their male counterparts but the difference was not significant. Nevertheless, female students (ADN) had significantly higher mean scores in pathogenicity than male students in level 1 ($p<0.018$) and level 4 ($p<0.001$).

Mean scores by students in different programs as well as teachers (Table 2 - next page)

Results in Table 2 show the highest mean scores in this order: teachers, BSN, ADN. Among the ADN students, females had higher scores than males in each subject area. All groups of respondents had the highest mean scores in immunity followed by infection control. The area with lowest mean scores was pathogenicity followed by epidemiology. Teachers had significantly higher scores than ADN male ($p<0.004$) and female ($p<0.038$) students, irrespective of subject area. Analysis of variance (ANOVA) showed that there was a significant difference between the scores by teachers, when compared to mean scores by ADN and BSN students, notably in epidemiology ($p<0.001$). Students in BSN obtained significantly higher mean scores in epidemiology than ADN male students ($p= 0.025$).

	Infection Control	Immunity	Epidemiology	Pathogenicity
BSN	61.2 +/- 26.1	66.0 +/- 17.6	54.6 +/- 15.2	46.1 +/- 20.8
Teachers	80.6 +/- 13.8	80.5 +/- 14.5	68.6 +/- 17.6	64.3 +/- 25.7
ADN Males	49.6 +/- 22.9	55..2 +/- 13.3	40.8 +/- 9.3	34.6 +/- 12.2
ADN Females	55.7 +/- 22.1	62.2 +/- 15.5	44.0 +/- 16.1	44.3 +/- 12.0
p-value:				
Teachers Vs BSN	0.052	0.060	0.073	0.098
Teachers Vs ADN Males	0.002	0.001	0.001	0.004
Teachers Vs ADN Females	0.007	0.014	0.004	0.038
Females Vs Males (ADN)	0.555	0.366	0.593	0.091
BSN Vs ADN Males	0.308	0.175	0.025	0.148
BSN Vs ADN Females	0.619	0.609	0.150	0.812
ANOVA	0.018	0.008	0.001	0.009

Table 2: Mean scores (SD) for ADN (males & females), BSN and Teachers according to the Subject Area

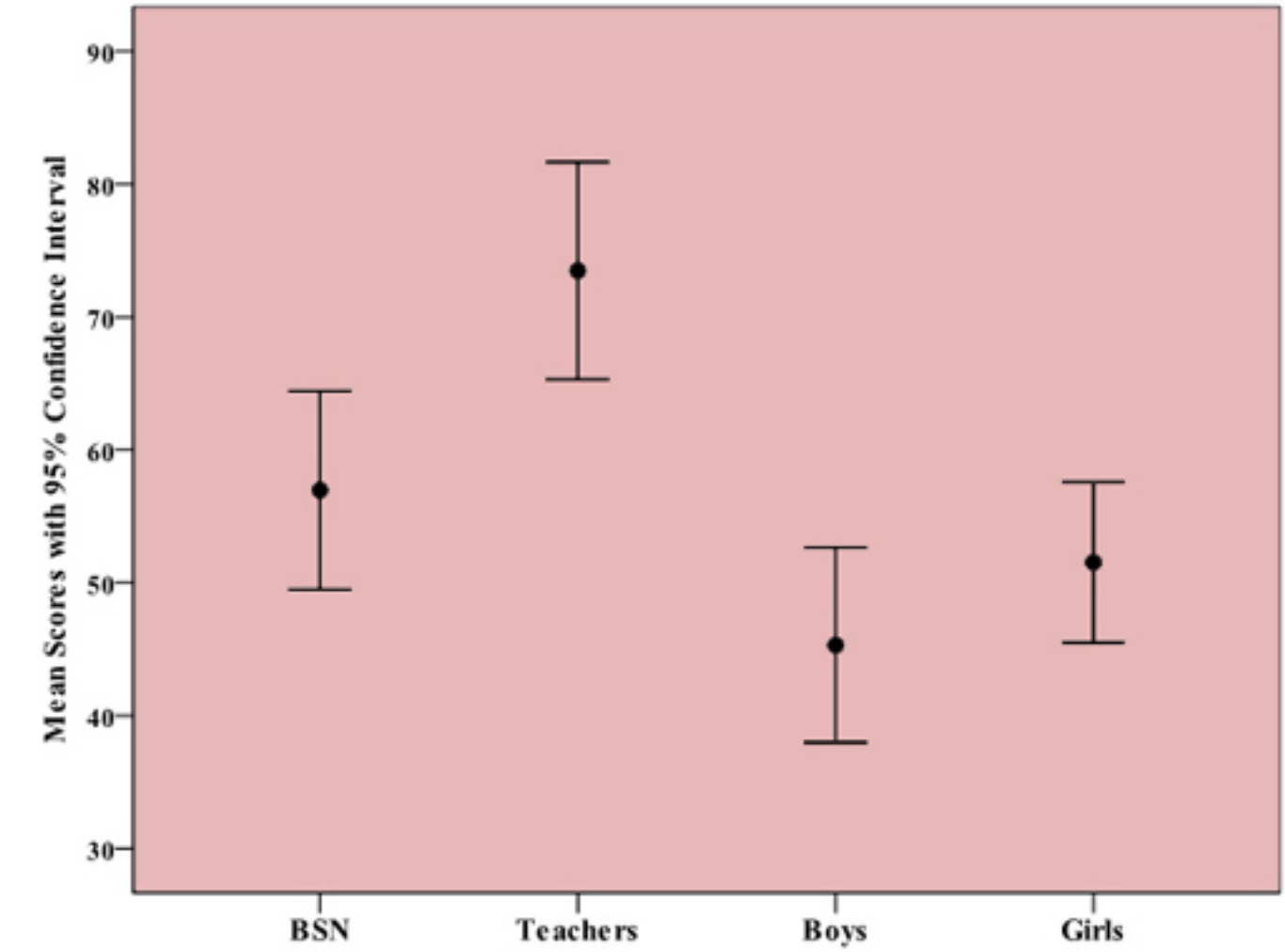

Figure 1: Mean scores by different groups of respondents

Error bar of mean scores by different groups of respondents (Figure 1).

Mean scores at 95 percent confidence intervals show that the highest score was achieved by BSN students and the lowest by males in the ADN program (Figure 1).

Discussion

Using teachers' mean scores as a standard, students' knowledge in different areas of microbiology was assessed. Thus, it was possible to identify areas of the microbiology course that required modification in order to improve the students' knowledge of the subject. As previously reported (Al-Kandari et al., 2009), the number of teachers available to participate in the study was much fewer than the number of students. Similarly, more females than males participated in the study (Al- Kandari & Vidal, 2007) possibly because nursing is not a preferred profession among males. Besides, it is the policy of the nursing college in Kuwait to admit only females to the BSN program (Al-Kandari et al., 2009). Although, students' scores generally increased with level of enrollment, ADN level 2 female students consistently had lower scores than those in level 1, irrespective of the subject area. This may be due to the fact that level 2 female students were a weaker batch.

Microbiology is a compulsory course for pre-registration nursing education (Goetz et al. 1992; Choe & Shin, 1999; Jordan et al., 1999; Wong & Wong, 1999; Henderson, 2000). Most students in the BSN program are registered nurses who had obtained Associate Degree in Nursing (ADN). The higher scores by the BSN students in the present study may be due to the fact that they had previously studied microbiology in their pre-registration training. Moreover, they had practiced nursing and therefore realized the importance of microbiology in their professional practice. This underscores the fact that students perform better in biosciences when they appreciate the importance of the subject in clinical practice (Davis et al., 2010).

Male students had lower mean scores than females because nursing is not popular with men and therefore they show less interest in the nursing courses, including microbiology. Oliveira et al. (2002) also observed that female dental students had higher scores than males. Previous studies reported that male nursing students suffered from heavy mental pressure and showed low identity to the nursing specialty (Lian-di & Ning, 2006; Ding et al., 2008). All groups of respondents had the highest mean scores in immunity and infection control which are the subject areas most relevant to nursing practice. On the other hand, all groups had lowest mean scores in pathogenicity, possibly because this subject area is sometimes viewed as less relevant to nursing practice. Davis (2010) reported that doctors and service users expect nurses to be able to discuss pathogenesis of diseases. Therefore, there is a need to improve on the course content and teaching of pathogenicity in nursing programs so that nurses may be able to explain disease processes to patients in the course of their professional practice. Lower knowledge in epidemiology among recipients may be attributed to the fact that epidemiology is taught in lectures but it is not reinforced by nursing practice.

Previous studies on teaching of bioscience in nursing programs have dealt with performance in the subject as a predictor of success in licensing examinations (Carpio et al., 1999; Wong & Wong, 1999; Reynolds, 2006) or the importance of microbiology in clinical practice (Atulomah & Oladepo, 2002; Denny-Smith, 2006), whereas reports on microbiology course content in nursing education (Reynolds, 2006; Goetz et al., 1999; Choe & Shin, 1999) discussed relevance of the different subject areas, the present study focuses on students' knowledge of each area of microbiology and the results have been used to identify aspects of the course content that need improvement. This approach may be applicable in the improvement of the contents of other basic science courses.

Conclusion

Students were weak in areas of pathogenicity and epidemiology. Therefore, the course content in these areas of microbiology needs to be improved.

The nursing program in Kuwait has good microbiology course content, covering the subject areas most relevant to nursing practice being, infection control and immunity in which nursing students had the highest knowledge. Students had least knowledge of pathogenicity concerning pathogens and the disease process that are more academic aspects of microbiology, not directly relevant to nursing practice. Enhancement of nurses' knowledge in pathogenicity could improve their discussion with doctors and service users. Improvement in epidemiology could reflect on nurses' awareness of numbers in record keeping for statistical purposes.

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DETERMINANTS OF FERTILITY BEHAVIOUR AMONG ADOLESCENT REPRODUCTIVE WOMEN IN BANGLADESH

Abstract

Adolescent's reproductive health and fertility behaviour in Bangladesh is in the worst condition. Fertility behaviour among adolescent reproductive women in Bangladesh, using national representative data from the Bangladesh Demographic and Health Survey (BDHS), 2003-2004, allowing for the existence of observed characteristics that affect both adolescent reproductive women and fertility was studied. The study pertains to 1,703 ever married adolescent women in the reproductive age group (10-19). The challenges and risks the young people face during this period impact directly on their physical and emotional mental wellbeing. The reduction of fertility is one of the major problems of developing countries in the world and Bangladesh is one of them. The purpose of this study is to identify the effects of various socio-economic and demographic variables on fertility in six divisions of Bangladesh. Multivariate analysis, such as multiple classification analysis, has been used to identify the important determinants of children ever born. The study result shows that various socio-economic and demographic variables affect on adolescents fertility. These are adolescent's education, place of residence, religion, working status, breast feeding etc. An inverse relation is found between age at marriage, and fertility. Results show that fertility is highest in rural areas than that of urban areas. Divisional difference reveals that fertility is highest in Chittagong division and lowest in Khulna division among the adolescent mothers. This also indicated that the total fertility rate decreased about 10% from 1999/00 to **2**003/04 respectively.

Keywords: Fertility behaviour, Adolescent reproductive women, **Multiple Classification Analysis and Bangladesh.**

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Introduction

Young people do not live in isolation. Much of what they do is determined by what others do including the leading adults in their families, in their communities and in health and education programs in the workplace and in policy and lawmaking positions Nurul M. I. (1995). One third of the world's population is between the age of 10 to 24 and four out of five of these young people live in the developing countries. They form a great pool of resources for humanity with their energy, idealism and fresh views. But at the same time, they can be quite vulnerable to the fast changes taking place around them. The tremendous flow of population towards the cities, the spread of telecommunications across cultural and geographic boundaries, increased traveling, a generally earlier beginning of puberty and a later age at marriage, a decrease in the influence and strength of the family as an institution, the advent of AIDS, increase in violence and easier access to potentially harmful tobacco, alcohol and other drugs, have significant impacts on the behaviour and health of young people. The International Conference on Population and Development (ICPD) held in Cairo in 1994 also emphasized the special needs of adolescents and youth. Since, then government and non-government organizations carried out some activities that are related to certain aspects of adolescents' health. The aim of this study is to isolate which factors under consideration contribute of the selected factors influencing fertility of adolescent reproductive women.

Fertility Phenomena in Bangladesh

Fertility refers to an actual reproductive performance of a woman or group of women. Fertility in Bangladesh is high even by the standards of developing nations. Although teenage fertility rates were declining throughout the late 1960s and early 1970s, their reproductive behavior emerged as a major social and health concern. Teenage mothers are more likely to suffer from severe complications during delivery, which result in higher morbidity and mortality for both themselves and their children. In addition, young mothers may not be sufficiently emotionally mature to bear the burden of childbearing and rearing. Early entry into reproduction denies them the opportunity to pursue academic goals. This is detrimental to their prospects for good careers, which often lowers their status in society. Bangladesh has been passing through a critical phase of fertility transition. The level of fertility started to decline since the mid-seventies. The decline occurred at a rapid pace during the period 1975 to 1993/94. The total fertility rate was 6.3 in 1975 and decreased to 3.4 in 1993/94. However, since 1993/94, the level of total fertility appears to be unchanged at a level of 3.3, as observed from the BDHS 1996/97 and 1999/2000 results. However, during the period 1993/94 and 1999/2000, the contraceptive prevalence rate has increased substantially from 44.6 per cent to 53.8 per cent. Bangladesh demography and health survey (BDHS, 2004) shows that, one-third of adolescents age 15-19 in Bangladesh has begun childbearing. Twenty-eight percent of these

Division	Total Fertility Rate				Percentage change in TFR		
	1993/94 BDHS	1996/97 BDHS	1999/00 BDHS	2003/04 BDHS	1993/94-1996/97	1996/97-1999/00	1999/00-2003/04
Barisal	3.47	3.31	3.26	2.9	-4.61	-1.51	-11.04
Chittagong	3.95	4.06	3.96	3.7	+2.78	-2.46	-6.57
Dhaka	3.45	3.18	3.21	2.9	-7.83	+0.94	-9.66
Khulna	3.05	2.52	2.70	2.8	-17.38	+7.14	+3.70
Rajshahi	3.03	2.78	3.02	2.6	-8.25	+8.63	-13.90
Sylhet	NA	4.20	4.08	4.2	NA	-2.86	+2.94
Bangladesh	3.44	3.27	3.31	3.0	-4.94	+1.22	-9.37

Table 1: Trends in Total Fertility Rate (TFR) by Divisions, and Percent Change for the Period 1993/94-2003/2004, Bangladesh

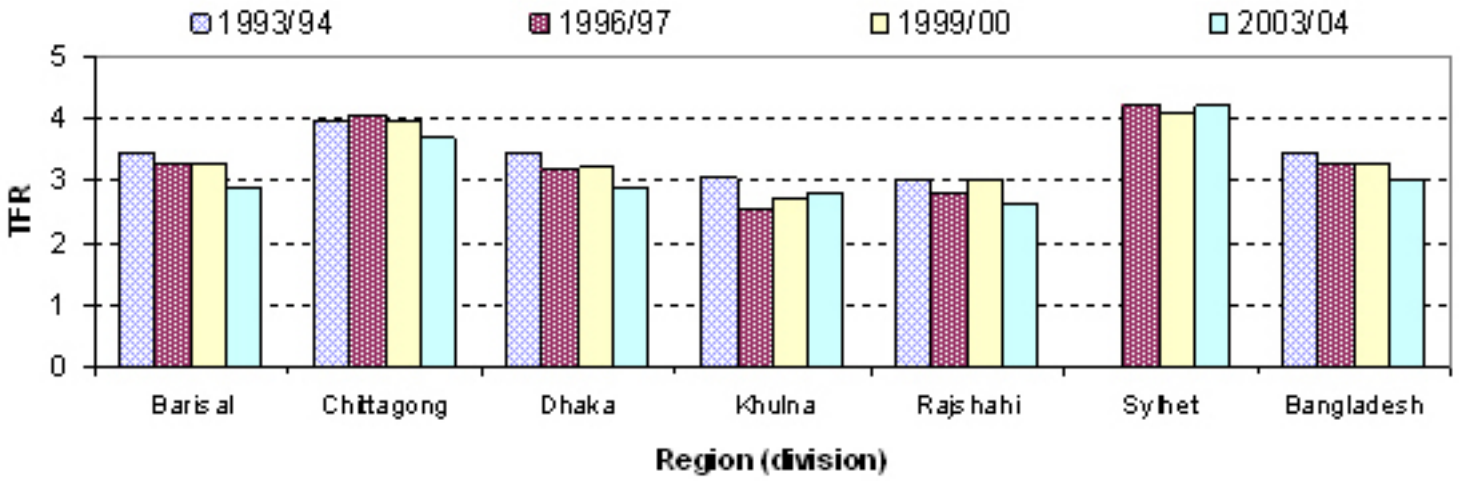

Figure 1: Trends in Total Fertility Rate (TFR) by Divisions for the Period 1993/94-2003/2004, Bangladesh

teenagers in Bangladesh have given birth, and another 5 percent are pregnant with their first child. As expected, the proportion of women age 15-19 who have begun childbearing rises rapidly with age. Early childbearing among teenagers is more prominent in rural areas, compared with urban areas in Rajshahi and Khulna divisions, compared with other divisions. Childbearing begins later in Sylhet, compared with the rest of the other divisions, mainly because of relatively late marriage in Sylhet. Delayed childbearing is strongly related to education among women age 15-19. Only 16 percent of the teenagers who had completed secondary education had begun childbearing, compared with almost half of those with primary incomplete or no education. Childbearing begins earlier among adolescents in the poorest 40 percent of the households; in these households, four out of ten adolescents have begun childbearing. In contrast, three out of ten of the adolescents in the richest 20 percent of the households either have had births or are pregnant with their first child. Some researchers strongly believe that family planning programs played the main role in the rapid fertility decline that occurred in less developed countries in the 1980s and 1990s.

During late 1980's to early 1990's all the divisions in Bangladesh experienced a more or less uniform decline in fertility. Even in Chittagong division, having the highest fertility in the mid-1980s, which is still continuing, the rate of decline was almost identical in magnitude as compared to that of the other divisions. However, since 1993/94 the decline in fertility is not uniform across the regions. During the period 1993/94 -1996/97, Chittagong division shows increase in fertility level by about 3 per cent, while all other divisions show some decline in fertility.

The magnitude of decline was higher in Khulna (17.4%) followed by Rajshahi (8.3%), Dhaka (7.8%) and Barisal (4.6%) during the period 1993/94 to 1996/97. On the other hand, during the period 1996/97 to 1999/00 fertility has increased in low fertility regions Khulna and Rajshahi and also in Dhaka, but declined in Barisal and Sylhet. During the period 1999/00 to 2003/04 total fertility rate declined in Rajshahi (13.9) and Barisal (11.04) divisions and increased in a low rate in Khulna(3.7) and Sylhet (2.94) divisions. Between 1999-2000 BDHS and the 2004 BDHS, the proportion of adolescents age 15-19 who had begun

childbearing declined slightly, from 35 to 33 percent. The total fertility rate in Bangladesh declined from 5.12 in 1989 to 3.44 in 1993/94 and remained constant thereafter. The total marital fertility rate showed a steady decline from 5.54 in 1989 to 3.81 in 1996/97. However, the rate appears to have increased to 3.94 in 1999/2000.

Data Sources and Methodology

The data for the present study have been taken from Bangladesh Demographic and Health Survey (BDHS), 2003-2004 which is a nationally representative survey of 11,440 women aged 10-49 and 4297 men aged 15-54 from 10,500 households covering 361 sample points (clusters) throughout Bangladesh; 122 in urban areas and 239 in rural areas. This survey is the fourth in a series of national-level population and health surveys conducted as part of the global Demographic and Health Surveys (DHS) program. It was selected from the master sample maintained by the Bangladesh Bureau of Statistics (BBS) for the implementation of the surveys before the next census (2001). It is designed to provide data to monitor the population and health situation in Bangladesh as a follow-up to the 1993-94, 1996-97 and 1999-2000 BDHS surveys. Previous surveys included only ever-married women and currently married men; this is the first DHS survey in Bangladesh to also include never-married men; i,e., the sample for the survey was ever-married women age 10-49 and all men age 15-54.

Methodology: There are a variety of socio-economic and cultural factors that may influence fertility among the adolescent's reproductive women. To examine the differential patterns of mean number of children ever born among adolescents, the well known Multiple Classification Analysis (MCA) is employed. Multiple Classification Analysis (MCA) requires one dependent variable and two or more independent variables. The dependent variable can be either a continuous or a categorical variable but all the independent variables must be categorical variables. MCA can equally handle the nominal and ordinal variables and can also deal with linear and non-linear relationships of predictor variables with dependent variables (Andrew F.M., James N.M., John S. and Laurak K., 1973).

Mathematically, the model can be expressed by the following equation:

$$Y_{ijk} = y + a_i + b_j + c_k + \text{---------} + e_{ijk}$$

where,

Y_{ijk} is the value or score of an individual who falls in the i th category of the of factor A, j th category of the factor B and k th category of the factor.

y is the grand mean of Y.

a_i is the effect due to the i th category of the factor A, which is equal to the difference between y and the mean of its category of factor A.

b_j is the effect due to j th category of the factor B, which is equal to the difference between y and the mean of its category of the factor B.

c_k is the effect due to the k th category of the factor C, which is equal to the difference between y and the of its category of factor C.

e_{ijk} is the error related with Yijk score of the individuals.

In order to assess the intensity of working status of women on their age at marriage and children ever born per ever-married women, multiple classification analysis (MCA) is adopted. The co-efficient $\eta 2$ and $\beta 2$ obtained from MCA respectively provide the unadjusted and adjusted coefficients. While $\eta 2$ shows how well a single predictor explains variation in age at marriage and $\beta 2$ shows the proportion of variation explained by a predictor taking into account the proportion explained by the other predictors. In this study the multiple classification analysis is undertaken first to evaluate the contribution of socio-economic and demographic variables such as respondent's education, husband's occupation, place of residence, religion, ownership of electricity, respondents working status, access to mass media, region, partner's working status and age at marriage on children ever born. In this case children ever born are taken to be the dependent variable and socio-economic and demographic variables as explanatory variables. All the socio-economic and demographic variables are the categorical variables. They are included in MCA in the fashion of the following table (Table 2 - next page).

Results and Discussions

The result indicates that the proportions of variance explained by MCA are not very high for women (Multiple R2). The low value of R2 may be due to some interrelations among the predictor variables considered here or there may be some other factors, which may affect the mean number of children ever born.

Table 3 (page 13) shows the mean number of children ever born both unadjusted and adjusted by different socio-economic and demographic characteristics with the values of h2 and b2 produced from multiple classification analysis with data of 2004 Bangladesh Demographic and Health Survey (BDHS). Here divisions, respondent's education, husband's education, husband's working status, place of residence, ownership of electricity, mass-media communication, religion, age at marriage, husband's occupation and work status of respondents are considered as the determinants of children ever born.

Variable		Category
Dependent	Independent	
Y = Children ever born	X_1 = Division	1 = Barisal 2 = Chittagong 3 = Dhaka 4 = Khulna 5 = Rajshahi 6 = Sylhet
	X_2 = Respondent's education	1 = Illiterate 2 = Primary education 3 = Secondary education 4 = Higher education
	X_3 = Husband's education	1 = Illiterate 2 = Primary education 3 = Secondary education 4 = Higher education
	X_4 = Partner currently working	1 = No 2 = Yes
	X_5 = Type of Place of Residence	1 = Urban 2 = Rural
	X_6 =Has Television	1 = No 2 = Yes
	X_7 = Respondents Currently Working	1 = No 2 = Yes
	X_8 = Ownership of Electricity	1=No 2=Yes
	X_9 = Religion	1 = Muslims 2 = Non- Muslims
	X_{10} = Age at First Marriage	1 = 10-14 2 = 15-19

Table 2: Variables and Categories Used in the Multiple Classification Analysis

Among the selected factors respondent's education is one of the most effective. It is important to note that highly educated adolescents have been found to have lower fertility. Findings indicate that educational attainment has strong association (h2=0.161) with mean number of children ever born. But the effects of educational level remain low even after adjusting for the effect of all other predictors in the model (b2=0.065). The mean number of children ever born was 0.74 for adolescent women who were illiterate and 0.55 for highly educated adolescent women. It may be that educated adolescents marry later and had lower fertility within marriage.

Husband's education seems to be a less effective factor than adolescent women's education in explaining the variation in mean number of children ever born among adolescent women (h2 =0.160, b2 =0.065). The adolescent women of higher educated husbands had the mean number of children ever born as 0.64 while it was 0.72 for illiterate husbands. Another socioeconomic variable that emerges from the literature as an important influence on fertility behavior is place of residence. Respondents with an urban residence have lower fertility than their rural counterparts. We find that place of residence has a low effect on mean number of children ever born (h2 =0.013). The mean number of children ever born (adjusted) in rural and urban areas, were 0.66 and 0.64 respectively. This may be due to the fact that adolescents in urban areas had later marriage, higher level of real income, better health services, educational facilities, and employment opportunities in the modern sector.

It is observed that Khulna division had the lowest number of children ever born (0.58) and Chittagong division the highest (0.77). Sylhet (0.71), Dhaka (0.64), Rajshahi (0.63) and Barisal (0.59), was the next to the level of Chittagong. Region becomes less important (h2 =0.078 and b2 =0.094) for adolescents when other socio-economic factors were controlled.

Muslim community has higher fertility than their non-Muslims counterparts. It may be due to the religious value systems, which influence individuals. Mean children ever born were 0.65 and 0.63 respectively for Muslim and non-Muslims community. Religion becomes less important (h2 =0.012 and b2 =0.009) for adolescents

Characteristics	Unadjusted	Adjusted	η2	β2
Divisions			0.078	0.094
Barisal	0.56	0.59		
Chittagong	0.74	0.77		
Dhaka	0.66	0.64		
Khulna	0.60	0.58		
Rajshahi	0.65	0.63		
Sylhet	0.67	0.71		
Respondent's education			0.161	0.065
No education	0.83	0.74		
Primary education	0.72	0.67		
Secondary education	0.57	0.62		
Higher education	0.35	0.55		
Husband's education			0.160	0.065
No education	0.81	0.72		
Primary education	0.66	0.64		
Secondary education	0.55	0.60		
Higher education	0.49	0.64		
Husband's working status			0.076	0.060
No	0.31	0.38		
Yes	0.66	0.66		
Place of residence			0.013	0.013
Urban	0.64	0.64		
Rural	0.66	0.66		
Access to mass media			0.086	0.032
No	0.69	0.66		
Yes	0.55	0.61		
Respondent's working status			0.014	0.009
No	0.65	0.65		
Yes	0.68	0.63		
Has electricity			0.044	0.047
No	0.68	0.69		
Yes	0.61	0.62		
Religion			0.012	0.009
Muslims	0.65	0.65		
Non-Muslims	0.62	0.63		
Age at first marriage			0.280	0.264
10-14	0.82	0.81		
15-19	0.42	0.44		
Grand Mean	0.631			
Multiple R^2	0.106			
Multiple R	0.325			

Table 3: Results of Multiple Classification Analysis of Children Ever Born per Ever-Married Adolescents by Some Selected Socio-economic and Demographic Characteristics, 2004 BDHS Data

when other socio-economic factors were controlled.

The work status of adolescents also shows a substantial effect on childbearing. Children ever born on the average was higher for non-working adolescents than working adolescents. Though the difference was not remarkable, still working adolescent women have produced a smaller number of children than the non-working group. Results show that mean number of children ever born was .63 those who did work and .65 those who did not work. For adolescent women work status also had a low effect on children ever born (h2 =0.014 and b2 =0.009).

Ownership of electricity shows least effect on children ever born. It is observed that mean (adjusted) children ever born were 0.69 and 0.62 respectively for "without electricity in the household" and "having electricity in the household". For adolescent women ownership of electricity also had a low effect on children ever born (h2 =0.044 and b2 =0.047).

The average number of children ever born decreases with the increased access to mass media. It is observed that mean (adjusted) children ever born per ever married adolescent women were 0.66 and 0.61 respectively for no access to media and access to media. It has less importance on children ever born (h2 =0.086 and b2 =0.032).

It has been observed from the Table 4.16, where the mean number of children ever born varies very high between husband's working status. Also Table 4.16 shows mean number of children born per ever married adolescents 0.38 for working and 0.66 for non-working occupations in their husbands. It has less importance on children ever born (h2 =0.076 and b2 =0.060).

Age at marriage has a direct affect on fertility and it is the most influential variable than all other variables. There exists an inverse relation between age at marriage and fertility which is the higher age at marriage, the lower number of children ever born. Adolescent women who were married at fewer than 14 years had on average .81 children; women who were married 15 to 19 years had on average 0.44 children. The effect of place of residence remains strong (h2 =0.280 and b2 =0.264) when other socio-economic variables are controlled.

Conclusion

The result deserves considerations from the viewpoint of policy implication. It has been found that the total effect of marital status has direct negative influence on fertility in almost all divisions. Thus rising age at marriage by implementing a minimum-age law may lower fertility, and breast-feeding may also indicate lower fertility since at that time adolescent women are risk free from reproduction. Adolescent's education and age at first marriage are one of the most important correlates which effect and are the strongest for explaining the variability in children ever born. Although the average level of education is very low, education still has a strong negative relationship with children ever born. The husband's education is also important but not as strong as adolescent women's education. Mass media and working status of adolescent women is also important, affecting the children ever born. Other variables also have some importance on reducing fertility such as religion, region and electricity facility etc.

From the above analysis we have observed that, total effect of female education on fertility is found to be negative. Education may provide better employment opportunities outside home and age at marriage can be raised through providing education. Based on the results it may be suggested that attention should be focused on the need for providing educational facilities, particularly in rural areas in order to depress the level of fertility in Bangladesh.

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PREGNANT WOMEN'S AWARENESS REGARDING VIRAL HEPATITIS B AND C

Abstract

Objective: To assess the level of knowledge and misconceptions regarding hepatitis B and C among Saudi pregnant women.

Methods: This descriptive study was carried out in the obstetric department, Mohail hospital, Saudi Arabia, from December 2010 to March 2011. The pre-designed questionnaire consisted of 35 statements about hepatitis B and C (risk factors, mode of transmission, immunization and prevention) and was completed by a total number of 126 pregnant women who were randomly selected.

Results: Out of 126 women only 34.9% had satisfactory knowledge towards HBV and HCV. There is statistical significant relation between women's level of education, number of parity and their level of knowledge (p <0.001). Misconceptions regarding HCV and HBV were very common among the study sample that 59.5% , 57.9%, 45.2% respectively consider family genetics, the general toilet in markets and foods as risk factors for infection.

Conclusion: The study findings reflects that there is unsatisfactory knowledge regarding HBV and HCV among women in the reproductive years. More efforts must be focused on correcting women's misconceptions and educating them into healthy behaviors through educational programs.

Key words: pregnant women, level of knowledge, hepatitis B, hepatitis C

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Introduction

Hepatitis is a significant global public health worldwide concern because of the large and increasing number of infected people and the associated morbidity and mortality.(1) Currently an estimated 170 million people or 3% of the world population have hepatitis C and 3-4 million are newly infected each year; HCV- related liver deaths are expected to be triple by the year 2020.(2) Worldwide two billion people are hepatitis B infected. HBV infection increases risk of liver cirrhosis and hepatocellular carcinoma. (3) Around 600,000 people die each year due to HBV related chronic liver disease. Incidence of hepatitis B in Saudi Arabia was 11.4/ 100,000. (4,5)

Hepatitis B and C transmission are predominantly parenteral, and caused by shared drugs injection equipment, unsterile skin penetration practices (e.g., tattooing, ear/ skin piercing, acupuncture), individuals undergoing dialysis, sharing of drug paraphernalia, needle stick injuries and house hold contact shared personal items such as toothbrushes and razors, and vertical transmission from mother to infant.(6_ However the primary routes of HBV transmission are perinatal and sexual contact.(7)

Hepatitis B and C current treatments are lengthy, costly, and have a huge impact on the family unit, and negatively affect quality of life through biological factors causing physical, psychosocial, interpersonal and sexual problems. (8) Women are expected to be the major victims of viral hepatitis infection because women use health care facilities more than men due to antenatal care and child birth, which may result in surgical procedures and hospitalization.(9)

Hepatitis infection is a major health problem. For all its severity, it is largely preventable. Prevention can occur through awareness and rigorous efforts.(10) For effective education, via intervention programs and interactive educational sessions, women's knowledge must be assessed to determine their needs, so the current study was conducted to assess women's awareness and misconceptions about mode of transmission and prevention regarding hepatitis B and C.

Subjects and Methods

This descriptive study was carried out in the Obstetric Department Mohial Asser Hospital from December 2010 to March 2011. A total number of 126 pregnant women who were selected randomly, were included in this study after giving informed consent. The researcher developed the assessment forms and the questionnaire. A review was made of the current and past literature which related to various aspects of the problem and this was done using textbooks, scientific journals, and internet. The questionnaire was pilot-tested on ten patients, who were not included in the main study, to assess clarity and feasibility of the tool. All data

Socio demographic characteristics	No.	%
Age / year		
15-24	48	38.1
25-34	54	42.9
35-44	24	19.0
Mean score (± SD) 28.6 ±7.3		
Residence		
Rural	106	84.1
Urban	20	15.9
Mother level of education		
Illiterate	28	22.2
Primary education	40	31.7
Secondary school	34	27.0
University	24	19.0
Mother work		
working	19	15.1
Housewife	107	84.9
Parity		
1-5	89	70.6
> 5	37	29.4
Modes of delivery		
Normal labor	92	73.0
Cesarean Section	34	27.0

Table 1: Women's General Characteristics (n =126)

Items	No.	%
Satisfactory	44	34.9
Unsatisfactory	82	65.1

Table 2: Women's level of knowledge regarding hepatitis B and C (n=126)

was collected on the designed questionnaire which included three parts; demographic data (age, work, residence,), and 20 questions about hepatitis B and C risk factors and modes of transmission (needle stick, sharing shaving instruments, piercing ears and mouth, mother to baby, breast feeding, sexual intercourse,) and 15 questions regarding prevention (vaccination for hepatitis B, not sharing other tools, needles to have one use, condoms in sexual contact,). Each question was allotted one point to the correct answer, no points to the wrong answer, with the scoring system for knowledge classified as follows; unsatisfactory knowledge for scores less than 50%, satisfactory knowledge for scores equal to or more than 50%. Data entry was done using Epi-Info 6.04 computer software package, statistical analysis was done using SPSS 12.0 statistical software packages. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables.

Results

Demographic characteristics of the study sample are presented in Table 1. The study sample mean age was 28.6 (SD+7.3), with the majority of them (84.1%) living in rural areas; 84.9% were housewives. 73.0% of them delivered their babies normally, with number of deliveries ranging from 1-5 was 81.7%. As regards educational level 31.7% had primary education but 19.0% were graduates.

Eighty two (65.1%) of women had unsatisfactory knowledge regarding hepatitis B and C mode of transmission and prevention, while approximately one third (34.9%) of them had satisfactory knowledge (Table 2).

Table 3 clarifies that 43.2% of women aged 25-34 years had satisfactory knowledge. Statistical significant relations between women's level of education and their level of knowledge was founded. The highest percentage (37.9%) of women having unsatisfactory knowledge about hepatitis B and C are illiterate, while 40.0% having satisfactory knowledge were among secondary educated women. Seventy one (86.6%) of women who delivered 1-5 times had unsatisfactory knowledge about

Item	Women' level of knowledge		P -value
	Satisfactory (%)	Unsatisfactory (%)	
Age			
15-24	34.1	40.2	0.682
25-34	43.2	42.7	
35-44	22.7	17.1	
Level of education			
Illiterate	5.0	37.9	.000
Primary education	28.3	34.8	
Secondary school	40.0	15.2	
University	26.7	12.1	
Parity			
1-5	40.9	86.6	.000
> 5	59.1	13.4	
Modes of delivery			
Normal labor	72.7	73.2	0.957
Cesarean Section	27.3	26.8	

Table 3: Women's characteristics by level of knowledge

Item	Yes		No		Not know	
	No.	%	No.	%	No.	%
Foods from restaurant	57	45.2	26	20.6	43	34.1
Drinks	25	19.8	50	39.4	51	40.5
Water	27	21.4	36	28.6	63	50.0
Check hands	40	31.7	40	31.7	46	36.5
Kissing	60	47.6	20	15.9	46	36.5
Genetic	75	59.5	16	12.7	35	27.8
General toilet in markets	73	57.9	16	12.7	37	29.4

Table 4: Women's misconceptions about Method of transmission regarding hepatitis B, C (n=126)

hepatitis B and C; more than half (59.1%) of the total sample had satisfactory knowledge among women who had >5 deliveries. There is significant difference between women's level of knowledge and number of deliveries, in relation to type of delivery; 73.2% had satisfactory knowledge among women delivering normally.

As regards women's misconceptions regarding hepatitis B and C, Table 4 shows that 45.2% of women considered foods from restaurants as risk factors of hepatitis B and C infection, 59.5% consider family genetics and 57.9% general toilets in markets, but 40.5%,50.0%,36.5%,36.5% respectively did not know if drinks, water, checking hands and kissing were methods of hepatitis B and C infection or not.

Discussion

Hepatitis has become a major public health issue. Persons with HBV or HCV infection are at risk for liver disease, burden of disease due to cirrhosis and carcinoma is high and is expected to increase in the next two decades.(1) efforts should be made to develop and implement educational programs for the Saudi community.

Concerning women's level of knowledge, our study revealed that nearly two thirds of the study sample had unsatisfactory knowledge regarding hepatitis B and C risk factors, mode of transmission and prevention, while approximately one third had satisfactory knowledge.

This result goes in line with a recent study (11,12) that shows the study sample awareness regarding hepatitis B was not satisfactory, and study about hepatitis C myths and awareness revealed that only 27.6% had correct knowledge.(13) Other studies show poor knowledge regarding hepatitis,(14,15) and significant lack of knowledge towards hepatitis B and C,(16) in contrast with another study that shows that more than 60% of participants were aware of both HBV and HCV. This difference in the finding might be attributed to differences in the sample educational level.(17)

In relation to women's knowledge and their level of education the current study shows the highest percentage of women having satisfactory knowledge are secondary educated, showing a highly significant relation between women's knowledge and their level of education. The same result was reported by several studies in different populations, that increased level of education increased level of HBV and HCV awareness.(17,18,19) The health care team plays an important role in educating people regarding hepatitis. This may explain the significant difference between women's knowledge and number of deliveries, In the present study women who had satisfactory knowledge delivered more than five times, but more than half had unsatisfactory knowledge between women delivered who 1-5 times.

Misconceptions about hepatitis B and C transmission are common among the study sample. Most of them think foods from restaurants, family genetics and general toilets in markets as risk factors for HBV and HCV. Our findings are similar to several studies which explained misconceptions regarding foods and shaking hands(12,20) and toilets.(21)

Conclusion and Recommendation

To conclude, these findings reflect that there is lack of general knowledge regarding HBV and HCV among women in their reproductive years. Additionally, there are misconceptions about transmission such as by foods, toilet and genetic transmission. More efforts must be focused on educating women about healthy behaviors that protect the family against hepatitis infection, especially in our societies, through mass media, interactive educational sessions and health education programs.

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NURSES' EXPERIENCES OF PROVIDING PALLIATIVE CARE IN AN INTENSIVE CARE UNIT IN SAUDI ARABIA

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Abstract

Background: In Saudi Arabia the majority of deaths occur in the hospitals. However, there are a few palliative care programs available to meet patients and families? needs. In the 1990s, a team of nurses and physicians in Saudi Arabia thought about the importance of having a special division of care concerning palliative care because of the need for improving palliative care services. The fact is that, there are many foreign nurses who are non-Arabic speaking and who work in different departments including intensive care units. This could interfere with patients' psychological and spiritual needs due to differences in cultures and beliefs.

Aim: The aim of this study was to explore the nurses' experiences of providing palliative care for critically ill patients in an intensive care unit in Saudi Arabia.

Method: A qualitative study design was used by using semi structured interviews. In total. nine participants who work in an intensive care unit in Saudi Arabia, four women and five men, were included in the study. Audio recordings were used in the interviews; and the length of each interview was less than half an hour. The included nurses worked full time and had been employed for at least three years. Four of the participants were Arabic speaking and the other participants were non-Arabic speaking. All the participants had been working in both intensive care departments, either acute or long-term care. Data was manually analyzed by means of qualitative content analysis.

Result: Six themes were identified and all themes reflect different nurses' experiences when they provide palliative care for critically ill patients in the ICU. The themes were presented as the following: Care in the ICU is challenging; Collaborative work to achieve patient's needs; Caring as a holistic approach; experiencing language as a support; experiencing language as a barrier; and Family-patient centered care and support.

Conclusion: The authors concluded that communication was a barrier when non-Arabic speaking nurses provide palliative care for critically ill patients and their families. The authors recommended hospital management to increase the number of Arabic-speaking nurses and to provide more translators in day shifts. In addition to have some palliative care nursing courses for all nurses to help them to provide better palliative care, especially spiritual care which has been found to be inadequate. Further studies are needed to study palliative care in the intensive care unit.

Key words: palliative care, nurses, experience, intensive care unit, critically ill patient.

Introduction

We are both critical care nurses and we are interested in studying palliative care in an intensive care unit (ICU). Both of us worked in different hospitals in the Kingdom of Saudi Arabia and we have observed patients with a variety of diagnoses. In Saudi Arabia there are different types of patients and in the hospital settings the ICU is considered to be a very important unit where very sick patients are admitted. Long term ventilated unit (LTVU) is a terminology that is used in many hospitals in Saudi Arabia to describe the intensive care unit that has many patients who are chronically ill and who need to have ventilators for a long time, beside intensive care. Since home care service is not yet mature enough in Saudi Arabia many patients are admitted to an ICU for long-term care and with supervision of critical care staff physicians, nurses and other health care workers.

Palliative care can be given to both acutely ill patients and chronically ill patients, since palliative care aims to alleviate suffering of patients and families. Intensive care units are equipped with very advanced machines and well-trained personnel; many patients are unconscious and the roles of nurses are important as we experienced. To deal with an unconscious patient the nurses need to know how to provide holistic care with respect to dignity. In addition, nurses should ensure that the patient receives all the care he\she needs even with the absence of verbal communication. An effective communication consists of good listening, using non-verbal communication, counseling, clarification and empathy (Lugton & Kindlen, 1999).

Many patients die in an ICU due to severity of their illnesses and this is considered to be a worldwide fact (Becker, 2010). The authors noticed the importance of providing palliative care in the ICU. As the Saudi nursing

profession is in developmental stage (Tumulty, 2001) and there are only a few graduated Saudi nurses who are aware of Saudi patients' needs based on the society's culture and religion. Many foreign nurses who are non Arabic speaking, work in Saudi hospitals especially in an ICU and this makes communication and providing desirable care inadequate as we have observed. From this point of view we wanted to do this study in one of the Saudi ICUs to get an insight into this care since it is rare to see palliative care being practiced in an ICU (Byock, 2006).

Background

The intensive care unit

Seriously ill patients who have dysfunctional or impaired organs are admitted to an intensive care unit (ICU) in order to receive a high quality of care from nurses and other people with different professions (Hov, Hedelin & Athlin, 2007; Waydhays, 1999). An intensive care unit (ICU) is a special unit in the hospital with staff specialists, which is found to manage seriously ill patients with complicated diseases (Bresten & Soni, 2009).

Many deaths occur in hospitals and half of them in the ICU. When a patient becomes chronically ill and with multi organ failure the needs for end of life care and comfort become important for the patient and the family (Angus et al., 2004). Patients who have physiological dysfunction, metabolic, immunological and neurological dysfunction and need to have prolonged ventilation support are called long term ventilated patients (Douglas, Daly, Brennan, Gordon & Uthis, 2001; Nelson et al., 2004).

Nurses' role in the intensive care unit

Intensive care nurses are in a critical position to identify and assess a patient and the family's needs by using a holistic approach including physical, emotional, spiritual and psychosocial aspects (Dawson, 2008). Critical care nursing is "that specialty job in nursing that deals particularly with patient responses to life threatening problems; it is a licensed profession where the nurse responsible must ensure that optimal care was given to a critical ill patient and their family" (American Association of Critical Care Nurses [AACN], 2010). Most of the nurses in the ICU have skills and experiences in dealing with critically ill patients (Hansen, Goodell, Dehaven & Smith, 2009).

Nurses in the ICU consider the families to be a part of the patients care; in addition those families need to have good support from health care workers in order to help them to cope with the patients' situation (Hov, Hedelin & Athlin, 2007). To meet the quality of care for patients in the ICU, needs a lot of work and time. Many protocols and policies are available in an ICU in order to meet the patients' needs (Ciccarello, 2003). "Experience is defined as the process of getting knowledge, skills from seeing or feeling things" (Cambridge Advanced Learner's Dictionary, 2010).

Palliative care

The modern palliative care was developed in 1960 in the UK. Dr. Dame Cicely Saunders was the first one who developed the patient centered care and holistic approach in palliative care. Dr. Saunders was concerned about patient and family care, home care, teamwork and communication between nurses and families after the patient's death which is incorporated in today's palliative care approach (Abu-Saad, 2001). The modern palliative care concentrates on respecting the patient's autonomy and their decision regarding life and death. In addition the modern palliative care considers practicing ethics in the palliative care with respect to individuals' needs and their values (Have & Clark, 2002). The hospice was developed to cover more cases than cancer; to include patients with neurological, cardiac and respiratory diseases (Lugton & Kindlen, 1999).

Palliative care "is an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual" (World Health Organization [WHO], 2010). Palliative care nursing in general consists of three main aspects; symptoms control, support of the family and support of the patient. The role of palliative care nurses is to assess the needs, plan, implement the action and evaluate the outcome (Dunn &Mosenthal, 2007).

The first definition of palliative care came in 1987. It was concerned about medicine in the UK. The definition states that "palliative medicine is the study and management of patients with active, progressive, and far-advanced disease for whom the prognosis is limited and the focus of care is quality of life"(Kim, Fall &Wang, 2005,P.9). Patients die in different places regardless to the causes but everyone has the right to receive support and care (Becker, 2010).

Palliative care approaches

Palliative care includes psychological and spiritual support. These aspects of care are important in any person's life. When treating patients the responsible health care providers should look after them as a human being with respect to cultures, values and beliefs. Palliative care considers relief from suffering and distressing symptoms as a priority to achieve a good quality of life. It regards death as a normal process and it offers support to both patients and families in order to help the patient to live actively until death and help the family in their bereavement (WHO, 2010).

There are keys factors of palliative care that consist of symptom management, patient and family support, teamwork with palliative care workers and communication between workers and patients. Teamwork in the palliative care consists of different health

professionals, for example doctors, nurses, social workers, physiotherapist and dietitians (Becker, 2010). The role of the interdisciplinary team is unique especially when the chronically and critically ill patient stays for a long time either in acute ICU or in a long-term care unit. Patients who stay for a long time allow health care workers to build a relationship and a trust for them and the team (Koesel, 2008).

When a critically ill patient is admitted to the ICU it may also have a bad impact on the family's psychological status because of the unawareness as to if the patient will have a prolonged stay or poor outcome. If a critically ill patient has a cognitive impairment the family plays an important role in the treatment decision. The patient's family in the ICU is a decision maker and not just visitors and they are expected to be involved in the patient's care (Camhi et al., 2009).

Palliative care in an intensive care unit

Critically ill patients in an ICU need to have pain and symptoms control to relieve suffering and to enhance a good relationship between the patient and their loved ones (Singer, Martin & Kelner, 1999). Palliative care should be a part of an ICU and it is appropriate for all critically ill patients who need to have aggressive treatment to prolong life with good quality of care (Nelson et al., 2004). Since many deaths occur in the ICU and death is unavoidable is the reason why critical nursing and palliative care needs to be integrated.

"It is important for nurses to understand the connection between palliative care and the intensive care unit" (Dawson, 2008, p.19). Because ethically, ill patients in the ICU and their families may benefit from a palliative care approach, which aims to comfort patients and provide them with good care and alleviate their suffering (Nelson & Meier, 1999).

Palliative care in the Kingdom Saudi Arabia

Saudi Arabia is one of the largest countries in the Middle East with a population of over 28 million people (Gap minder, 2009). In Saudi Arabia there are a few palliative care programs in hospital settings. Alsirafy, Hassan and Alshahri found that about 86 percent of cancer patients died in hospitals; as a result this need for improving palliative care services in the Saudi hospitals is very important (2009). In the 1990s, a team of nurses and physicians in Saudi Arabia thought about the importance of having a special division of care concerning palliative care for cancer patients. As a result, many other hospitals in Saudi Arabia started to develop palliative care programs as well (Al-Shahri, 2002).

Islam is the dominant religion in the country; Islam views human life as holy and asks people to protect it. Muslims view illness as a test of faith from Allah and it is intended as a cleansing by Allah, not as a punishment. At the same time, Allah and His Prophet asked Muslims to seek treatment and not terminate life for any reason (Daar & Khitamy, 2001). The Oath (promise) of the Muslim doctor includes the responsibility to protect human life in all stages and under all circumstances. They have to do the best to rescue the patients from death, disease, pain and anxiety by using an instrument of God's mercy, extending medical care to everyone near and far, good and bad and friends and enemies (Daar & Khitamy, 2001). Furthermore, palliative care also considers the ethical principles which regulate the healthcare for patients including four concepts of ethics e.g. nonmaleficence, justice, autonomy, and beneficence.

Terminally ill patients in hospitals in Saudi Arabia constitute a very important group that needs qualified and sensitive care that addresses their physical, psychosocial and spiritual needs (Alshahri & Alkhenaizan, 2005). A patient is a member of a large family in Saudi Arabia and the family is responsible for the patient when he or she is sick. A patient's relatives in Saudi Arabia ask for treatment till the last moment even if the patient is dying (Young, Moreau, Ezzat & Gray 1997). Halligan (2006) studied the critical care nurses' experiences in Saudi Arabia when providing care in hospitals; the result indicates the importance of integrating religion and culture into patient care. In Saudi Arabia there are many foreign nurses who are non Arabic speaking and they work in different departments including the ICUs and this could interfere with a patient's psychological and spiritual needs due to differences in cultures and beliefs (Al Shahri, 2002; Nixon, 2003).

Aim

The aim of this study was to explore the nurses' experiences of providing palliative care for critically ill patients in an intensive care unit in Saudi Arabia.

Method

A qualitative study design was used in the present study. Qualitative research involves analysis of data or narrative material e.g. interview or dialogue, and is considered to be a good method to study experiences (Polit & Beck, 1999).

Data collection

On December 25, 2010, the authors did face-to-face interviews with nine nurses who work in an ICU. A semi-structured interview technique with open-ended questions was used which helped the participants to describe their experiences when providing palliative care in the ICU. This type of interview helps the participants and the authors to follow up the sequence of the questions (Kvale, 2010). see Appendix I.

Participants

Nine nurses were interviewed. Two tape recorders were used to avoid any technical problems. All participants agreed to record their interviews except one nurse. The

Theme	Care in the intensive care unit is challenging		
Categories	Physical distress		Emotional distress
Sub-categories	ICU is a unique situation	Need more time and efforts	Patience and tolerance
Codes	- Very sick patients - Different diseases - Patients with chronic diseases - Poor prognosis - Intensive care unit is a unique situation - Save lives	- A lot of procedures and competencies - Open visiting hours - Gives maximum care. - Hemodynamic support. - Invasive procedures. - Long term patients - Give more chance for patient to recover.	- Many young people die - Very sad feeling - Prolonged care. - Prolonged relationship with family and patient - Close relationship with patients - Sympathetic feeling of patient and family - Feeling of family

Table 1: Example of codes, subcategories, categories, and theme from content analysis of narrative about nurses' experience.

author used notes to document her experience. Inclusion criteria included nurses who work in the ICU and were working in the morning shift; nurses with experience of more than three years and speak English fluently. They have either bachelor or diploma in nursing and are assigned as clinical nurses. The interviews were done in two separate ICU facilities, the Medical-Surgical and long-term patient care ICU. The interviews were done in the conference rooms in the ICUs. All participants met the study criteria and were chosen by the authors with help of charge nurses in the units. Participants' information papers were given to the participants prior to the interviews (Kvale, 2010). See appendix, II.

To test the credibility of the interview guides, two pilot studies were conducted (Polit & Beck, 1999). The pilot studies showed the relevancy of the answers to the aim of the study and from this pilot study one following question was created.

Data analysis

Data were manually analyzed by means of qualitative content analysis (Polit & Beck, 1999). All the data was transcribed by verbatim transcription and then the relevant data were extracted. Each sentence was then read several times and main ideas were coded according to the specific meaning. Meaning units were used for words, sentences and paragraphs. Condensed meaning units were used for meaning units, then the statements categorized to codes according to the main ideas. After that, all sub categories were summarized to the main categories. The main categories were collected to give meaningful themes, which were used in the result (see Table 1).

Authors ensured that nothing important was missed by reading it again to identify if there was anything remaining.

Ethical Considerations

The study was done after approval from the nurses' services department in the hospital. See Appendix, IV.

The name of the participants was not asked for because of privacy issues; international council of nurses' code of ethic takes care of the participants' information and voluntariness and authors considered this aspect during processing the study (International Council of Nurses, 2010). Furthermore, the authors considered the beneficence and the autonomy of the participants in answering the questions. According to the Declaration of Helsinki; the authors considered the participants' rights to withdraw from the study or to refuse to answer the questions for any reason (World Medical Association [WMA], 2011).

During the interviews the authors considered the privacy of the place and confidentiality of the participants so the interviews took place in conference rooms in the ICUs. The interviews were coded with no references to the nurses. The nurses' duty in the hospital was twelve hours and the participants had been taken from their coffee break so snacks were given to the participants at the end of the shift (after the interviews) as a compensation for their break time. In addition the authors are obliged to respect the participants' information and ideas. The authors stated honestly during the transcription of the recorded or spoken information with no alteration to the original data. The authors are responsible for deleting the recorded interviews after finishing their thesis.

Results

In total, nine participants who work in an intensive care unit in Saudi Arabia, four women and five men were included in the study. They included nurses who worked full time

and had been employed for at least three years. Four of the participants were Arabic speakers and the other participants were non-Arabic speakers. All the participants have been working in both intensive care departments, either acute or long-term care. The result will be shown according to main themes. Six themes were identified from the data as following:

1- Care in the intensive care unit is challenging.
2- Collaborative work to achieve patient's needs.
3- Caring as a holistic approach.
4- Experiencing language as a support.
5- Experiencing language as a barrier.
6- Family-patient centered care and support.

Care in the intensive care unit is challenging

There were two categories identified from the data (1) physical distress and (2) emotional distress.

Physical distress

There is one subcategory as the ICU is a unique situation, and there are different codes under this sub category. As the ICU is a unique situation there are very sick patients with different diseases, either acute or chronic, for example cancer, in addition to having patients with poor prognosis and who need intensive care and follow up.

"Work in the ICU is very challenging" p6

According to one interviewee *"ICU is a stressful area" p3*

Care in the ICU needs more time and effort; in the ICU there are a lot of invasive procedures and competencies to perform since there are many long-term cases and very sick patients who need hemodynamic support and good care. Nurses need to provide maximum care to save lives, moreover having open visiting hours in the departments requires nurses to have skills and competencies to deal with different situations.

"We treat the patient until the last moment" p6

Emotional distress

Working in the ICU needs more patience and tolerance because in the ICU there are many young people who die due to different diseases and this is very sad according to nurses in the ICU.

One of the interviewees was crying and said

"I think it is very bad so many people under twenties die, it is touching" p6

In the ICU there is a close relationship between family, patients and nurses and this affects nurses psychologically if something wrong happen to patients, many nurses share the family's feeling and are sympathetically involved.

"I feel really sympathetic with a family if their patient is not good or they're just about to die. This happen frequently, almost weekly" p8

"We are dealing with patient's family and friends and most of them for like 3 years or more, this is a challenge to assess mentally" p2

Collaborative work to achieve patient's needs

The teamwork included two categories, which are identified from the data: (1) interdisciplinary team work (2) and meeting goals.

Interdisciplinary team work

Participants express their experiences for effective teamwork cooperation, which appears as crucial for them during work in the ICU.

Nurses describe the importance of nurses in the interdisciplinary team while they work in the ICU.

"It plays an important role starting with nurse, physician, dietician and pharmacist. We are the first line contact with patients so we are very important and also in the circle so it is very important to work as a team" p9

Nurses showed the importance of nurses' involvement in the teamwork as a primary health care provider.

"Most of the team will come to the primary nurse asking specifically about your patient" p2

Nurses showed that they are the first members who express patient needs and information to the teamwork throughout the ICU.

"We are the ones who deliver the information at the first hand and my patient has fever what I am going to do? And if he or she is on an antibiotic does he need another thing? To bring up the problems concerning the treatment because I am a primary nurse" p2

Nurses describe the need for teamwork while they work in the ICU and this gives maximum benefit to the patients.

"For sure to give maximum benefits of caring for your patients to work as team" P1

Moreover the nurses think about missing care when there is no teamwork in the ICU.

"If we do not have interdisciplinary teamwork and good communication there is no way to get patients better at all like every member in the team is important starting right with the bed nurse, clinical pharmacist, dietician, to consultant and everybody has a role and by communicating with each other like hopefully it will be nothing missing" p8

Nurses mention how they can express their feeling when they work in the ICU with teamwork.

"Everybody should appreciate the others in the unit, it is not the consultant who is dominant, everybody can express ideas and their opinion freely" p8

Nurses assume that exchange of knowledge is good between team

members during their working in the ICU.

"Teamwork will affect us, it will make the information better for us; we will get more information from the consultant maybe from nurses and from the consultant to physician so we are sharing" p7

"We try to open our mind so maybe there is something new for us to learn"p2

Exchange of experiences is one of the benefits that come from working together with different nationalities in teamwork in the ICU.

"You work with many people from all over the world, it is great experience"p3

Meeting goal

Nurses are clear regarding how to achieve goals through communication when they work as a team in the ICU.

"Try to achieve most of your goals by communication with the multidisciplinary team" p8

Nurses also identified the importance of achieving clarity and avoiding ambiguity of care during working as a team in the ICU.

" We are a disciplinary team who target the patients' benefits as soon as possible and reduce admission days and to protect the patient from errors"p7

"Whenever we discuss it means that errors will be less and the patients' condition will be better"p7

"We have to involve the staff and clear up all the issues" p2

Nurses find that working as a team meets the patients' needs.

"One team is working for the sake of the patient"p9

Give maximum care for patients in the ICU; nurses describe the benefits from working as a team to meet patients' needs.

"For sure to give maximum benefits of caring for your patients is to work as a team"p1

With the completion of work nurses also play an important role in the teamwork in the ICU.

"Teamwork is great, we call them and they come, great cooperation. I have no problem with my team I think everyone is very professional" P3

"It is like a circle if you eliminate one there will be a gap"P9

Caring as a holistic approach

Caring in the ICU is given under a standardized system with respect to a policy and procedures. In addition to standardized care; holistic care is given with respect to the religion and ethics in the country.

"Actually we are treating here in a holistic manner, not physical aspect not only the pain, we are in Saudi Arabia we are more in the ethic side, more in religion as well" P5

"You have to approach patients in a holistic way, ethical, emotional, physical and psychologically" P9

Standardized care

Nurses' experiences that there are policies for each procedure that helps to give standard of care. There are guidelines that facilitate the work for nurses to manage different symptoms like pain, moreover, referring patients to other specialists when needed to treat different symptoms.

There is a protocol for everything that makes the care equal for all the patients.

"If a patient has fever related to sepsis we have a protocol to treat sepsis, we have a protocol for everything" P8

Nurses mentioned the importance of symptom control and pain management by using protocols and providing comfort.

"If a patient is nauseated we deal with them and give prescribed medication, we are trying to give our best to make patients comfortable, and we have standard care, and we treat pain and assess q4 hours by using the pain scale" N1

The aim of care in the ICU is to provide comfort for the patient and if a patient is dying to provide good end of life care.

"Comfort care is the key elements… at least you should provide comfort care"N6

"Most of the times if no codes the patient will go peacefully" N2

Experiencing language as a barrier

Experiencing language as a barrier includes one category as (1) Ineffective communication

Ineffective communication

Communications is a problem according to the nurses and they express their feelings in the following.

"Arabic language is not our first language" p2 and p3

"Language is a barrier" p3

Some nurses express that if the patient has a tracheostomy the nurse cannot communicate with the patient so they need to communicate with the family and explain everything to them but the language is difficult.

"Some patient have tracheostomy so we communicate with family and language is difficult"p4

"Probably communication is a problem"p6

Nurses experience misunderstanding between non-Arabic speaking nurses and patients and their families during working in the ICU.

"You explain something to the family and somebody else translated so the information can be misunderstood as well"p3

"If I cannot get whatever they are trying to tell me I told them wait a second I do not understand, I am going to find somebody to please help me. If they ask for something and I give something else it will be a problem"p2

Nurses experience of inadequate information is given to the family by a doctor or translators in the ICU.

"Most of time discussion is in Arabic so we do not get the full sense… I do not know if patients and family get enough information… I do not think they get too much involved, how much the patient and family is getting information about the prognosis I have doubt"p6

Nurses cannot tell the truth to the patient's family in the intensive care unit and they express their feeling on that.

"We are not telling the truth to the patient unless to the family …. So the family will not get nervous, some families they get so nervous… We are not allowed to say, here this is the doctors who have authority to tell"p6

Nurses ask for help from translators and Arabic nurses when they face difficulties to explain the patient condition to the family

" We call the translators to get the right message"p2

"I am really not good in Arabic speaking. I usually call ward clerk or any Arabic speaker in unit and we have quite few of them as well"p5

Nurses also mention that not all the patients in the ICU are conscious.

"We are not the best unit in communication because in most of our patients the level of consciousness is not so good"p8

Experiencing language as a support

Experiencing language as a support included two categories (1) family, nurses and patient relationship and (2) Methods of communication.

Family, nurses and patient relationships

Nurses were concerned of communication which resulted in having strong relations and ties between them and the patient and their family in the ICU.

Family consent and approval for any medical procedure in the ICU is vital according to nurses when they communicate with a patient's family.

" A lot of patients are intubated, after 14 days start aiming to do tracheostomy, we do discussion with family we have to have approval for that…We explain for the family the procedure, and prevent complication of ETT" p7 (Endo Tracheal Tube)

Method of communications

Nurses explained some methods of communications they used to send the right message to the patient and their family while they communicate with the patient and the family in the ICU.

Nurses think of the family and the patient relationship and what is the outcome from this relation when they give care to the patients in the ICU.

" Communication here in Saudi Arabia; they are very close to their families so you need really to address all these issues and information"p5

Nurses used different methods to provide correct information to the patient and family in the ICU.

"We call the translators to get the right message"p2

"We have Arabic translators they help us to translate"p3

Furthermore the nurses use sign language to communicate with patients

"Some they use sign language or interpreters"p2

" We have clue cards with different pictures to show those who are alert"p3

Nurses explain about the relationship and support to family during their work in the ICU.

" If a patient is sick family will be anxious. I cannot blame them because this is their family member and they are close to each other, and it is here different"p5

" After my experiences you always have to put yourself in shoes of patient"p9

" I am getting old information from family since they know more about patient and this is a big help"p5

Nurses point out that social workers provide support for nurses and families when they work in the ICU.

" We use social workers, a lot of family uses patient relation"p1

" I have to know more about my patient not just nurse to the doctor but also with social worker and patient relation we work together and gather the information and then in the outcome we can see this"p2

Arab nurses mention that they help non-Arab speakers when they communicate with patient and family in the ICU.

" As Arab nurse I have no problem with language, on the other side we are helping other staff how to understand patients and to be interpreter between family, patients and staff"p1

Family-patient centered care and support

There are two categories under this theme, one is the family education and the second one is support as holistic care.

Family education

Giving care to critically ill patients in the ICU involves providing support for both a family and a patient and this is an important aspect in the ICU. The support includes family education and covers all aspects regarding a patient's care and providing holistic support. Supporting the family involves the

explanation of different procedures, providing information, assurance and providing consultations to the family when they need them.

"We have to sit with the family, reassure them but not false assurance, speaking honestly … We should communicate with them and calm them down" p9

Support as a holistic approach

Communication is very important with a family and in addition to providing them with a comfortable place during the visiting time. Nurses try to absorb the family's reaction especially if the patient is deteriorating and he or she is very sick.

"Having support to the family should be a big consideration, especially here; family should be involved but not only here but everywhere" p5

"You consider yourself a part of the family, let them feel that the patient receives the needed care, let the patient feel comfort because the family is involved in the care of the patient" p7

Nurses mentioned the importance to assure family and calm them down when communicating with the family during delivering some information about the patient.

Nurses point out care satisfaction for patient and family is the aim of their work in the ICU.

" Patient care and family satisfaction is a very important aim in our hospital"p7

Helping a family and a patient to practice their spiritual needs for example, praying or doing supplication of God (Allah). In family-patient centered care; patients will be helped to be free from social isolation during the admission to the ICU.

"If they want to stay with the patient we let them, and if they want to pray or to bring Zamzam water (Holy water) we support, we never say no" p2

Some nurses state that due to culture differences they are not familiar about patient's cultures and this may affect providing spiritual support.

"The culture here in Saudi Arabia is that people are most religious and feel too much relief if you talk to them about this but not all nurses can do this because they do not share the same culture" p8

Discussion

Method

In December 25th, 2010 the authors did nine interviews, eight of them were recorded and no problems occurred during the recording. On the other hand one interviewee refused recording, the interviewer used notes to document her experience and this took a long time to write everything down. The interviewer discussed the documented data with this nurse to confirm her answers to the given questions. Both authors did the interviews in the same time but in separated places by using a conference room in each unit. One author did four interviews with nurses in the medical-surgical ICU. The other author did five interviews in the long term care ICU. It was heavy for authors to do nine interviews in one day but because of the short time they did them. At the beginning of the interviews the authors felt encouraged to do all the interviews, but compared with the end of the day the authors felt tired and using tape recordings saves much effort and time.

In this study there was no dropout. The authors did the data analysis cooperatively and they discussed the analyzed result several times to get the proper themes that reflect the nurses' experiences. The study's transferability can be assured by using the same criteria of the participants. However, this study is limited to nine nurses and it does not represent all the critical care nurses in Saudi Arabia. It was conducted in one hospital because of the time limit.

Content analysis is a method that was used in this study because it is a good method to analyze personal experiences (Polit and Beck, 1999). This method helped the authors to identify the main themes through breaking down the narrative sentences to meaning units then condensed meaning units and have the main codes and themes according to Graneheim & Lundman, 2004. The authors spent a long time reading and understanding how to do content analysis and checked their process several times with the supervisor. Hence using this method for the first time; it was a challenging for authors. To ensure the credibility of the result a third person (the supervisor of this study) has been involved to check the data analysis and discuss different themes.

Result

This study highlights the important aspects of palliative care e.g. symptoms control, communication, team work and family support and this generally agrees with different literature that investigated the same topic in different countries. Six themes were identified and they reflect the nurses' experiences when providing palliative care in the ICU. These themes show how nurses deal with patients and their families during working in the ICU providing palliative care. Nelson and Danis stated in 2001 that palliative care is a part of intensive care and it is appropriate for all critically ill patients who need to have an aggressive treatment to prolong life with quality of care. The participants in this study deal with different diseases including acute and chronic cases. In this study palliative care approaches are similar to those that are documented in literature; according to Becker, 2010 there are keys of palliative care that consist of symptom management, patient and family support, team work with palliative patients, and communication between health care workers, family and patient.

Symptoms management

Symptoms control was an important aspect according to the critical care

nurses especially pain control and other symptoms e.g. nausea. In the ICU nurses state that they have different protocols to standardized care to deal with different symptoms, in addition to having competencies that keep them updated to achieve maximum patient care. According to Hansen, Goodell, Dehaven and Smith (2009), nurses in the ICU have skills and experiences in dealing with critically ill patients.

Alshahri and Alkhenaizan (2005), state that terminally ill patients in Saudi hospitals constitute a very important group that deserves qualified and sensitive care, which meets their physical, psychosocial, and spiritual, needs. All the participants in this study report the importance of keeping patients free from pain and help them stay in a comfortable place, and if a patient is dying, someone needs to provide him with good end life care.

According to the ICU nurses in this study the main aim of critical care nursing is to protect patients and their families from suffering and help patients to recover and this seems to be a universal goal for health care workers. Singer, Martin and Kelner (1999) state that critically ill patients in an ICU need to have pain and symptoms control, to relieve suffering for the patient and the family, in addition to enhance a good relationship between patient and their loved ones. Holistic care has been stated by different nurses and this agrees with Alshahri and Alkhenaizan (2005). Terminally ill patients in hospitals in Saudi Arabia constitute a very important group who need qualified and sensitive care that addresses their physical, psychosocial and spiritual needs in terms of a holistic approach.

Team work in the intensive care unit

All participants in the present study emphasise the importance and the need for teamwork when they work in an ICU and find this is required for maximum care for critically ill patients. Prolonged care in an ICU creates a strong relationship between health care workers, patients and families and this agrees with Koesel (2008). The role of the interdisciplinary team when providing palliative care is unique especially when the chronically critically ill patient stays for long time either in an acute ICU or in a long term care unit. Long time care allows health care workers to create a relationship with a patient and build trust with the family. One of the benefits that teamwork can get from each other is exchanging information and knowledge when they work together in the ICU according to the majority of participants.

Nurses explain that they are the first in the team when delivering care to patients, and this is in line with previous findings by Dunn and Mosenthal (2007); the role of palliative care nurses is to assess the needs, plan, implement the action and evaluate the outcome. Nurses describe teamwork as a circle. Nurses are the first line contact with patients, so this is crucial to give complete care and avoid ambiguity of care.

Communication in the ICU

In the present study the majority of nurses are non-Arabic speakers and they found that language is a barrier to communicate with a patient and family. According to (Al Shahri, 2002; and Nixon, 2003), there are many foreign nurses in Saudi Arabia who are non-Arabic speakers and who work in different departments including the ICUs and this could interfere with patient's psychological and spiritual needs due to differences in cultures and beliefs.

In the present study some nurses experience language as a method of support by communication with the patient and the family. This communication can strengthen the relationship and give more support to the patient and family. On the other hand some nurses express the misunderstanding that may happen between non-Arabic speaking nurses, patients and their families during working in the ICU and if nurses want to explain something they need to have a translator to help them to translate the messages. However many times the translated message is misunderstood. Since there are many non-Arabic speakers, some nurses doubt that patients and families get enough explanation about care and support and this is a problem because the language is difficult to understand by nurses.

Family and patient support

Critical care nurses in this study report the importance of supporting the patient's family and provide them with different support spiritually, emotionally and psychologically. A family is an important member in delivering care for critically ill patients in the ICU according to critical care nurses and this gives the same result as Young, Moreau, Ezzat and Gray (1997); that a patient is a member of a large family in Saudi Arabia and the family is responsible for the patient when he/she is sick and they try to protect the patient from harm.

Nurses in the ICU mentioned different ways of supporting family e.g. communication, explanation and providing them with consultation with doctors in a comfortable place even though they do not have enough translators. Some nurses stated that Saudi people are religious and supporting them from this aspect is an effective way, and this agrees with Halligan (2006) that the result indicates the importance of integration of the religion and culture to patient care in Saudi Arabia. Unfortunately in this study the majority of nurses are non-Arabic speaking who are unaware of Saudi culture and they cannot provide spiritual care, which is needed by critically ill patients and their families according to the participants. Spiritual care appears inadequate when nurses mention holistic care and this is contradictory with providing proper palliative care nursing.

Conclusion

In conclusion, in this study we tried to explore critical care nurses' experiences when they provide palliative care nursing in an ICU in Saudi Arabia. In general palliative care nursing is applied in the chosen hospital and nurses are aware about applying this care. The authors conclude that communication was a barrier when non-Arabic speaking nurses give care for critically ill patients. Spiritual care is one of the important aspects in palliative care, yet it appears insufficient in this ICU since the majority of nurses cannot communicate in Arabic and provide the needed support.

The authors highlight the importance of communication and therefore they recommend the hospital's management provide adequate numbers of Arabic- speaking nurses and provide more translators in day shifts. Hospital management needs to focus on providing social network like social workers and interpreters where nurses can find strong support to provide palliative care and communicate with a family. A patient and the family's right to have enough information should be considered as a part of working in the ICU. The authors anticipate implementing these recommendations to provide palliative care nursing and promote good quality care for patients and families. Further studies are needed with focus on providing spiritual care for critically ill patients in the ICU. Having some palliative care courses would help nurses to provide better care especially spiritual care which has been found to be inadequate.

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APPENDIX 1

INSTRUMENT

Semi structured interview with participants in English language with a duration of approximately thirty minutes it consists five questions

1- Can you tell me about your experience when providing care for critically ill patients in the ICU? Can you give some examples?

2- What do you think about interdisciplinary team work when providing care in the ICU?

3- How do you experience dealing with patient's symptoms when the patient is critically ill?

4- How do you experience communication with critically ill patients and their families when you provide the care?

5- What is your experience when providing support for patient's family? Can you give an example?

APPENDIX 2

PARTICIPANTS' INFORMATION

RESEARCH TITLE

Nurses' experiences of providing palliative care in an intensive care unit in Saudi Arabia

BACKGROUND

Nurses in the intensive care unit (ICU) have different knowledge, skills and experiences in dealing with critically ill patients. They hold an important position in identifying and assessing patient and family needs with the use of a holistic approach. A holistic approach includes physical, emotional, spiritual and psychosocial aspects of nursing. Many critical care nurses are expert in delivering high standards of care for ill patient. These patients require expert care and support in the intensive care units. Many protocols and policies are available in the ICU in order to meet the patients? needs. In the 1990s, a team of nurses and physicians in Saudi Arabia started thinking about the importance of having a special division of care concerning about palliative care and to be provided for cancer patients. Terminally ill patients in the hospitals in Saudi Arabia constitute a vulnerable group that deserves a qualified care and sensitive care that addresses their physical, psychosocial, and spiritual needs.

AIM

The aim of this study is to explore the nurses? experiences of providing palliative care for critically ill patient in an intensive care unit in Saudi Arabia.

Inquiry concerning participation: you have been chosen through the head nurse of the intensive care unit depending on the criteria of study; that you have experience not less than three years, you speak English and you work as abed side nurse.

How the study will be conducted? The method, which will be used, is an interview and will be carried out by the researchers; there are about five questions, which are studying the participants? experiences. The interview will be will be taken approximately one hour per participant. During the interview a tape recorder will be used after getting permission from the participant. The data will be analyzed manually and transcribed by researchers.

What are the risks from the study?

No risks are predicted from the study.

Dealing with data and confidentiality

The data will be collected through the interview will be tape recorded and transcribed into a document. No names of participants will be asked and no other personal information will be included, even the hospital name will not be documented. After finishing from the study, the researchers will be completely responsible about deleting all the data from the tape recorder and an unauthorized person will not access the recorded data.

Voluntariness

In this study it is optional for the participants to participate or withdraw at any time without giving any reason.

Responsibility

The researchers will be responsible about all the data collection and responsible about deleting all the information after finishing from their study.

Researchers' information

Sharifa Alasiry (nursing student)

Hanan Alshehri (nursing student)

Research supervisor

Jörgen Medin

APPENDIX 3

Stockholm, Sweden
7-Dec-2010

To:

Subject: Request for approval to conduct our final thesis study

Our names are Sharifa Alasiry and Hanan Alshehri and we are registered nurses from Saudi Arabia. We are at present studying in the International Bachelor programme Bachelor in General Nursing at Sophiahemmet University College, Stockholm, Sweden. Our Chosen subject for the Bachelor thesis is Nurses' experiences of providing palliative care for critically ill patient in the Intensive Care Units in Saudi Arabia (a summary of the study design and content is enclosed with this letter). We are very interested in conducting the study in the intensive care unit

If you approve our request of conducting the study in the Intensive Care Unit, your signature is required on the attached form. Please send us this form using the enclosed a dressed envelope. Do not hesitate to contact us or our supervisor if you have any queries or comments regarding the study.

Yours in anticipation,

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SUBJECTIVITY IN QUANTITATIVE NURSING RESEARCH: SUPPORTING THE POSTPOSITIVIST VIEWS

Abstract

The credibility of research is important for its consumption. Reviewers and consumers of research place huge emphasis on the validity and reliability of the results which are mainly affected by the level of objectivity in the research process. Debates still exist between supporters of different paradigms as they disagree on what makes research credible, what makes it valid and to what extent, and which methodology is more appropriate. This paper presents a comparative view of credibility between quantitative and qualitative paradigms by exploring the issues of subjectivity and objectivity in its methodologies. In this discussion more weight is placed on the "subjective decisions" made by the so called "objective researchers".

Key words: subjectivity, objectivity, quantitative and qualitative research, methodology, nursing

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Introduction

The main purpose of research is to discover a reality that is believed to exist through exposition and discussion. Researchers have various definitions of reality dependent on their philosophy and experience. Metaphysically speaking, Positivists believe that reality is fixed and orderly and can be uncovered objectively, while Postpositivists believe it is imperfectly comprehensible and never perfect (1,2). Thus, in quantitative research the credibility of knowledge is maximized when the distance between the researcher and the subjects is minimized (3) placing the subject(s) within a highly objective state where no subjective interference can affect the findings. Postpositivists, however, believe findings are always subject to falsification by pre-existing knowledge or critical others, such as editors (1,2), and in a probabilistic sense (4). In terms of objectivism and relativism, quantitative inquiry supporters have long claimed it to be foundational and capable of describing reality as it really is (5, 6) though threats usually exist to falsify them. For them, what is so special about science is that it is derived from facts and not based on personal opinions (7). Qualitative researchers, however, assume that reality is subjective (highly affected by the researcher) and that multiple realities exist (4) as evident, for example, by the introduction of the Q-methodology (8). Although appearing often in the context challenges to methodology (9), the consistent debate between the two methodologies has surpassed the broader umbrellas of ontology and epistemology. It is inappropriate to use the term methodology in discussion of ontological claims (9) since the philosophical underpinnings of research methods are rarely explicated in nursing literature (10). Exact translation of the divergent validity of the two approaches is not appropriate (11) though translated standards of validity are legitimate (12). To distinguish between the two paradigms, authors have long argued the credibility of approaches based on their beliefs of what can be known and what methodology is more appropriate. While debates still exist, supporters of each paradigm appear to be no closer to a consensus (13). In addition to being the default research modality (14), supporters of quantitative methodologies base their arguments of credibility on the objectivity of the inquiry. In nursing research, however, reaching a highly objective quantitative study is impossible because of the many subjective decisions made by researchers. This article presents evidence from the literature on the subjective decisions quantitative researchers take in their "objective studies" and discuss their effect on the findings credibility.

Subjective decisions made through the scope of an "objective study"

For quantitative researchers, the research process starts with acknowledgment of a problem. This is in itself a subjective recognition of a dilemma and a biased acceptance of an issue. A well known example is the recognition of the climate change problem (Does it Exist?). The following sections present some of the subjective decisions made in quantitative nursing studies which are thought to affect their credibility, supported with examples from the literature.

Subjectivity in reviewing the Literature

Unlike qualitative researchers who avoid an in-depth literature search not to contaminate their inquiries by previous knowledge (3), quantitative researchers undertake a thorough literature search to establish the problem, largely to determine any gaps in the knowledge, and identify a suitable study design that assists analysis of their research findings. These purposes can be affected by individual decisions and are not fixed with one rule. Researchers decide what to read and what to exclude, and what databases to consult and what type of sources (primary or secondary) to rely upon. In addition, there is a strong reliance on one language, usually the language of the researcher; the Chinese medical experience is a standing example. Some Chinese drugs have found recognition in Western Medicine, (e.g., the treatment of Malaria). In one study, for example, an RCT proved Chinese herbal formulation improved symptoms for some patients with Irritable Bowel Syndrome (15).

Although some systematic reviews have been very exhaustive, no simple guide is available to accept and interpret findings. For the same question, multiple designs and inclusion criteria can be used. For example, a systematic review on stress management interventions for mental health nurses (16) which included papers that only met certain criteria (English language publication, between 1966 and 2000, professional groups concerned, primary research, and measuring specific outcomes) and excluded others (foreign language publication, papers with insufficient statistical data, and studies with subjects other than psychiatric nurses) based on a subjective judgement by the reviewers; as reviewed papers were reconsidered where there were differences between the reviewers judgment. One can hardly find a nursing study based on absolute evidence or systematic review/Meta analysis. For example, Meijers et al. reviewed the literature with the aim to examine relationships between contextual factors and research utilization in nursing and found no single study to be of high methodological quality for the purpose of their review (17). In addition to the experimental references, researchers might base their studies on opinion articles or anecdotal data, bearing in mind that evidence is not always evaluated, let alone the high percentage of errors in presenting relevant data (18). In turn these misinterpreted findings become accepted 'truths' which are perpetuated each time they are used in literature reviews, falsifying subsequent research.

Subjectivity in seeking ethical approval

Research with human subjects requires ethical approval. Amendments and changes could be required in some or all research elements if the ethics committee of the day suggests the research could predispose subjects to harm or might not protect their privacy. Ethics committees and their rules are dynamic; they have to adequately respond to the pressures of the day. Deciding the rules that make the code of ethics in research is subject to human decisions and the process, whilst carefully debated and proposed, is not a highly objective issue. This is evident by the many changes made to the rules and regulations of health research as well as the differences that exist between countries, particularly with studies involving vulnerable subjects. The way any scholar, philosopher or ethicist conceptualizes ethics and interprets the meaning of the (moral) language is not universal in nature because conceptions of an ideal moral judgement differ (19). Ethical regulations of research with humans affect the choice of design and might change the line track of experiments. Although ethical requirements for conducting medical research in developing countries have achieved considerable prominence in recent years (20), many studies are conducted in some countries that simply could not be undertaken in others (21).

Subjectivity in choosing a design

The research design incorporates most important methodological decisions researchers make (3). There are rules for excluding designs from top hierarchies, yet this by itself is a subjective matter and might vary between researchers. Designs lacking one or more conditions of a true experiment (manipulation, control, and randomization) might decrease the credibility of findings. Researchers have begun to employ mixed methods to solve practical research problems (22). Five purposes for mixed methods are identified, all of which hold within them, subjective significance: triangulation, complementarity, development, initiation, and expansion (23, 24), though others think mixed methods cannot be combined for cross-validation or triangulation, merely for complementary purposes (5). The choice of a design, rather than achieving congruency with the research question in some cases, is dependent on the experience of researchers, the resources available to them and their ability to conduct a study rigorously. Delphi technique, for example, has been utilised by many nurse researchers, and the rigour associated with the original format has been threatened. Keeney et al. critically examined the Delphi technique and found no one study used the `Delphi' in the same way; which, in their opinion, could be criticised as a threat to the uniformity of the method (25). Researchers' decisions about design are

independent of those for data collection methods. Deciding which method is the 'best' for answering the research question may often fall outside the congruency argument and once again is dependent on previous knowledge of the researcher.

Subjectivity in choosing the sample

Quantitative researchers recruit samples that allow them to generalize their findings. However, a representative sample is the one whose features approximate those of the population and may not exactly match those of the population, let alone the non-probability sampling procedures used. The question here is; is 'approximate' good enough? In many cases this question is seldom asked and sample choice and their margins for error, glossed over. Although it is problematic, non-probability samples are used in most nursing studies because it is convenient and economic. Another subjective decision when choosing the sample is the power analysis, which mainly depends on estimates of the effect size. Results of a power analysis on 62 nursing articles (26) indicate that a large number of published nursing studies have insufficient power to detect real effects because of the small samples used.

Subjective decisions in collecting the data

While a number of data collection approaches entail more subjective judgment, other research problems require higher degrees of objectivity (3). Data collection tools are enormous in quantitative research, and the use of one tool over the other is subject to the researchers' evaluation of its validity and reliability. Although there are some rules, what is valid and reliable for one researcher might be not for another, as many researchers recognize the weakness in some tools yet still use them. Researchers might use self-reports to answer their questions, while others use observation to answer similar questions. For example, collecting data from people through surveys, interviews, or focus groups may provide useful information but this does not make the activity a research study (27). Another example is the use of a health diary in nursing research and the advantages and disadvantages associated with its utilization (28). As such, limitations in data collection tools include the vulnerability of data to researcher's biases (29).

Subjectivity in analysing the data

Two subjective decisions emerge in this regard; the subjectivity in the essence of statistics and the subjective decisions taken by the nurse researcher during the analysis. Although statisticians developed conditions and mathematical equations to rule data analyses, limitations still exist (30). Kenny et al. stressed the notion that data analysis should be a more thoughtful process as standard data analysis tools remain the same (30). Quantitative analysis of data relies basically on the theory of statistics, a theory that uses numbers to represent measured variables. As a matter of fact, the discrepancy between these numbers and the actual values of variables is known as measurement error. Researchers try to keep measurement error to a minimum by measuring the validity and reliability of their instruments which relies basically on subjective decisions. Cronbach's alpha, for example, a measure of reliability is considered acceptable if its value was 0.8 or more, though others subjectively say 0.7 or more (31).

Another example of the subjectivity in statistical analysis is regression where researchers try to explain how well a set of variables is able to explain a particular outcome (32). In regression analysis, researchers never reach a 100% explanation of a variance as there are undetectable variables that might predict the outcome variable as well. Likewise, Analysis of covariance might help remove the effect of an extraneous variable but certainly not all confounds.

Subjective judgments in dealing with data once back from subjects include cleaning, counting, and coding; these activities also involve decisions on missing values. Another subjective decision relates to testing hypotheses which requires gathering data about dependent and independent variables which are "thought" to have some kind of cause and effect relationships (31). Statistically testing a hypothesis has a number of conditions which are greatly affected by the researcher's opinion and not totally subject to objective rules. Researchers still engage in incorrect practices; using some tests when others should be used. Although some tests exist to guide decisions about normality of distributions, hence the use of appropriate statistical tests (31), researchers vary in their decision for considering a distribution normal or not. Researchers need to remember the basic assumptions of parametric analyses which include normality, linearity, multicollinearity, and homoscedasticity (32). In this regard, a review of quantitative methods used in health promotion research (33) found limited use of advanced statistical techniques that could help address important knowledge and practice issues. Statistical presentation often appears like a code which can deter nurses' full understanding of the evidence (34). Another study that reviewed the presentation and analysis of ordinal data in nursing research (35), found a large percentage of nursing studies do not present and analyse data properly, resulting in misleading information.

Subjectivity in interpreting the findings

The interpretation of findings is the major subjective decision a quantitative researcher can take. Prior to drawing conclusions, findings require objective and critical interpretation. However, many studies have been interpreted in a way that reflected the researcher's arrogance to an ideology and not the reality itself. Evidence for this is exemplified in the different reviews a researcher might gain from two independent reviewers; one

positive and the other negative. Researchers need to remember that a lack of impact or effect is not sufficiently established by a failure to demonstrate statistical significance (36). Nevertheless, in some cases it has been interpreted as just that. The relevance of findings must be examined by considering alternative explanations such as concurrent influences, subjective measurement techniques, and statistical regression (37, 38).

Subjectivity in drawing conclusions and making recommendations

To be reasonable, recommendations and conclusions should be directly linked to the results. However, events sometimes happen that cannot be detected and subsequently influence the researcher's concluding statements and recommendations. For example, a review showed that despite the considerable work that had been done to establish the interpretability of quality-of-life measures much more work is left to be done on its acceptability (39). Guyatt et al. stress that the field remains controversial, and there are many alternative approaches, each with its own advocates (39). Accurate recommendations drawn from accurate conclusions are the only method that can ensure future practice is not repetition of previous failed attempts. If there are accurate evidence-based recommendations, future success is almost guaranteed.

Discussion

Despite the increased recognition of qualitative research in nursing, debate on its objectivity and validity still exist. Consequently, articles on credibility and representativeness of qualitative research have been written (40-43) and the stigma attached to quantitative research is slowly being eroded by violation of the objectivity rules, the nature of nursing research, the availability of extensive research findings supporting the claims, and the increased support of specialist qualitative researchers in nursing. The aim of this article was to remind those who critique qualitative studies on their credibility that subjectivity also exists in quantitative research. Absolute objectivity in social and health research such as nursing is highly unlikely and the notion of having hierarchies of evidence by itself is a wiping out of the objective nature of quantitative research.

Drew discussed the gap between subjective experience of researchers and the inherent objectivism of science and research (44). She supports the views of Husserl about the danger arising from adopting only an objectivistic positivistic model of the world and ignoring the personal beliefs of researchers and how they experience themselves and their work (44). Drew, in the beginning of her discussion, claimed the absolute objectivity of quantitative research, a claim that was encountered by an opposite view later on when she presented the views of Husserl, asserting researchers return to their immediate experience and to the life world from which their enterprises arise (44). These views are supported in this article though for quantitative research. While the core purpose of research is looking for reality, this paper discussed the reality of nursing research when it explored what has happened, and what is happening and not the hypothesised ideal theory of objective quantitative nursing research.

This paper systematically presented examples of subjective decisions taken by quantitative researchers as an everyday practice that show threats to its core advantage over the qualitative paradigm of objectively uncovering the reality, a reality that is faultily apprehendable and never ideal. Despite these limitations, quantitative researchers still defend their approach with the claim that some empirical data are better than none. However, it is even now accepted by a significant number of both qualitative and quantitative researchers that qualitative research methods can be used to identify causal relationships and develop causal explanations (45). Based on the question, findings from qualitative research have a place in evidence based nursing practice, much the same as quantitative studies do (46).

The many articles critiqued within nursing research provide unambiguous substantiation on the limited rigour these studies had. The reviews on errors in nursing research, particularly quantitative, are clear evidence on the falsification of their conclusions. It is imperative to realize that scientific theories cannot be conclusively proved or disproved. If reasoning in drawing conclusions from factual basis is sound, which is debatable and subjective, the resulting knowledge can be considered objective (7). A literature review on utilization of nursing research (17) showed that nursing knowledge is not reflected in the practice of care, and researchers recommend more robust methods for better understanding of the impact of contextual factors on nurses' use of research. Monti and Tingen suggest multiparadigmism for the present and future development of the nursing science (47). Others (48) advocated that all graduate students should learn to utilize and to appreciate both methodologies as De Leeuw claimed that mixing modes has only advantages (49). Unlike some who thought it is not (6), the compatibility and cooperation between the two paradigms is sustainable.

Conclusion

The question of which paradigm should guide nursing science still stands. In the main, the objectivity of quantitative research leads the argument into its 'right' of being the bases for nursing research. However, quantitative studies are couched in subjectivity and the reality is still subject to researchers' judgment, and it is never perfect. The steps of quantitative research are subject to the researcher's own judgment of appropriates or feasibility which in turn depends on the allocated resources and experience. For consumers of research, whether they are ordinary people or experts, understanding of the origins of science gives them a

way to judge the value of research. While each approach has its own advantages and disadvantages, its own strengths and limitations, there is a need for quantitative researchers to admit their subjectivity in the execution of their research and for qualitative researchers to recognise how quantitative research could add value to their research endeavours. Perhaps a mixed methods approach might be one feasible solution for tempering the debate.

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INSULIN DEVICES AND REGIMENS

Abstract

Insulin therapy is one of the treatment lines for management of diabetes mellitus. Insulin therapy can be used at different conditions during the life of the diabetic patient although it is the main treatment for patients with type 1 diabetes. Insulin devices are always the issue discussed by the patients as well as insulin regimens. In our review we discuss these two issues in a simple way so junior medical and nursing staff dealing with diabetic patients can understand them well.

SECTION 1: INSULIN DEVICES

The following devices can be used for the delivery of insulin:

1.1 Syringes and needles
1.2 Pens
1.3 Jets
1.4 Inhalers
1.5 Implants
1.6 Pumps

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1.1 SYRINGES AND NEEDLES

Patient Information

o Syringes come in many different sizes to match insulin strength and dosage.

o Syringes are designed for single use only, and the intact syringe should be disposed of immediately.

o Syringes should be stored in a temperate, dry area.

o Short, fine needles are used.

Advantages

- Syringes are

o extremely small and make the injection process as painless as possible.

o Inexpensive.

- Injections are quick.

- Syringes can be used with all available insulins.

- More than one type of insulin can be used in the syringe.

Disadvantages

- Withdrawing insulin from a bottle may not be discreet.

- It's challenging if you don't see well or your fingers are numb, stiff or shaky.

- Insulin analogues cannot be used with this device.

Information for Health professionals

- There is still a role for syringes.

- Errors in dose are frequent with this device.

- The size of the syringe and needle used by patient need to be verified.

- Inadvertent intramuscular injections may cause glucose swings as absorption is faster than by the subcutaneous (SC) route.

- Advise another device if there are problems.

1.2 PENS

Patient Information

o Insulin pens contain cartridges filled with insulin.

o Pens can have replaceable cartridges or pre-filled cartridges that are then disposed of after use.

o Users turn a dial to select the desired dose of insulin and press a plunger on the end to deliver the insulin just under the skin.

o Pens need to be held in place for several seconds after the insulin is delivered to ensure that no insulin leaks out.

o A new needle needs to be attached for each injection.

Advantages

- Pens are:

o convenient, discreet and easy to use.

o useful with low dosages of insulin.

o easy to use for people with impaired vision or limited manual dexterity.

- The needles used help minimize the discomfort of injection.

- Pens may benefit children and people with needle phobia.

Disadvantages

- Pens cost more than syringes and needles.

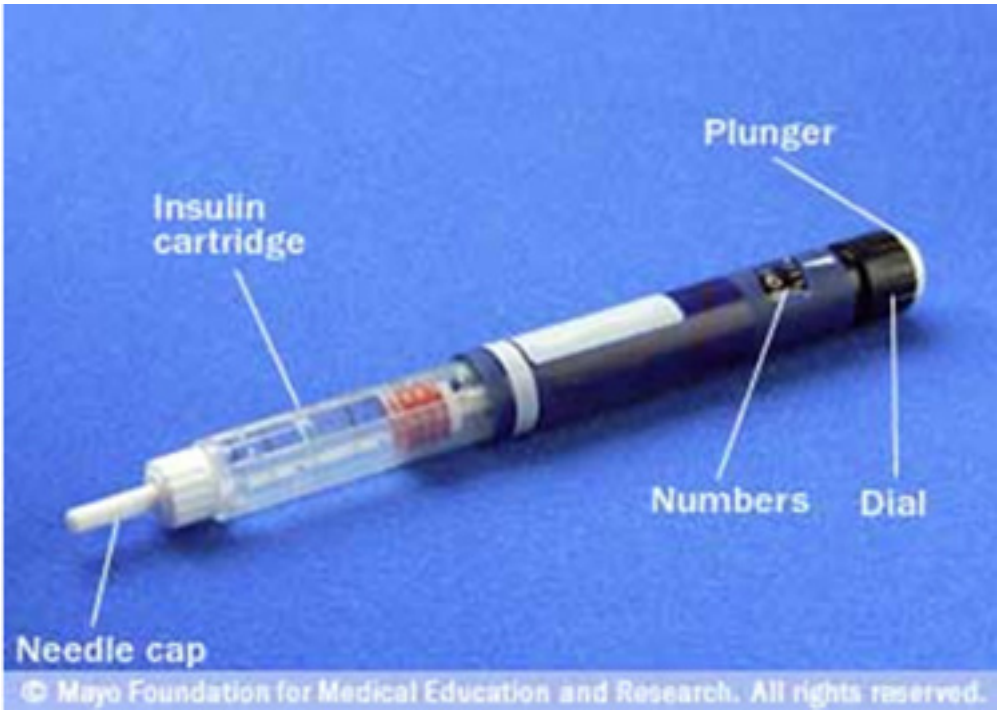
- Pens may require two injections if more than one type of insulin is used.

- It is not possible to mix different types of insulin in one pen.

Information for Health professionals

o Greater patient acceptance and preference for the pen over the vial/syringe method may support insulin initiation and compliance, particularly in type 2 diabetes.

o Correct training is the key to successful use.



1.3 JETS

Patient Information

o Jets are needle free insulin delivery systems.

o The insulin is injected directly onto the skin.

o The type of insulin can be varied.

o They can be used with single or mixed insulin.

o Jets are compatible with cartridges and vials.

o Injection sites are the same as with pens.

Advantages

- Jets are

o good for people who have needle phobia.

o flexible and easy to carry around.

o easy to use.

- No needles mean no sharps and no problems with sharps disposal.

Disadvantages

- Bruising is a problem with jets and injections site have to be changed often.
- Jets make a noise when delivering the insulin.
- Jets may be expensive.
- Setting up jets takes time.
- Insulin vials need to be carried around and refrigerated.
- Sterilisation is advised every 2 weeks.
- Disposables may be hard to find.

Information for Health professionals

o Jets are good devices for people who are needle phobic.

o Key disadvantages are bruising and noise which may have an impact socially.

o Injection sites need to be changed often.

o Cost may be a problem.

o Jets give more flexibility and

1.4 INSULIN INHALER

Inhaled insulin has been withdrawn from the market.

1.5 IMPLANTABLE INSULIN - MINIMED

Patient Information

o Implantable insulin delivers insulin through the peritoneum.

o Implantable insulin has a positive displacement piston design which has an insulin reservoir under negative pressure.

o An external electronic communicator controls operation.

o A side port allows direct access to the delivery cannula for clearing occlusions.

Advantages

- Invisible pump
- Comfortable
- Freedom from injections

Information for Health professionals

- Delivery into the peritoneal cavity with rapid absorption
- COMPLICATIONS:

o Under-delivery caused by aggregation of insulin in the pump or catheter blockage due to fibrin clots.

o Dramatic increase in insulin antibody levels.

1.6 INSULIN PUMPS

Patient Information

o Pumps are devices that are connected to the skin and continuously deliver programmed amounts of insulin into the body

o The basal bolus is the rate delivered during the day.

o The meal bolus is the units of insulin given with meals.

Advantages

- Pumps can be used in patients who are not achieving control with many injections of insulin.
- Pumps can reduce incidences of severe hypoglycemia.
- Pump rates are adjustable for individual activity/meals.

Disadvantages

- Infections may occur at the site of insertion into the skin.
- Should the pump stop working Diabetic Ketoacidosis (DKA) may occur.
- Pumps may be cumbersome with sport and need to be removed is swimming or diving.

Information for Health professionals

o Pumps are the most physiologic method of delivering insulin subcutaneously to achieve near normal glycemic control.

o Pumps give better glycemic control than treatment with multiple daily injections and pumps are well tolerated (2).

Caution

o There is a need for regular glucose monitoring.

o There is a risk of DKA with pump failure.

o Possible infection may occur and pumps need to be removed if sport involves immersion in water.

SECTION 2: INSULIN TYPES AND REGIMENS

2.1 INSULIN TYPES

The appropriate insulin regimen for each patient with diabetes will depend on their type of diabetes and their individual needs and circumstances.

Insulin regimens should be tailored to the individual, taking into account the patient's type of diabetes, previous control, age, dexterity, eyesight, personal and cultural preferences.

Insulin is available in different formulations that act at different rates.

Rapid-acting: insulin lispro, insulin aspart, and insulin glulisine

o Short-acting: regular (soluble) insulin

o Intermediate-acting: NPH (isophane) insulin

o Long-acting: insulin glargine and insulin detemir

Biphasic insulins are also available. These are a mix of rapid- or short-acting insulin with intermediate acting insulins, mixed in different proportions.

Insulin Preparation	Onset of Action (h)	Peak action (h)	Effective duration of action (h)	Maximum duration (h)
Rapid-acting analogues				
Insulin lispro (Humalog)	¼ - ½	½- 1 ¼	3-4	4-6
Insulin aspart (NovoLog)	¼ - ½	½ -1 ¼	3-4	4-6
Insulin glulisine (Apidra)	¼ - ½	½ -1 ¼	3-4	4-6
Short-acting				
Regular (soluble)	½ - 1	2-3	3-6	6-8
Intermediate-acting				
NPH (isophane)	2-4	6-10	10-16	14-18
Long-acting analogue				
Insulin glargine (Lantus)	3-4	8-16	18-20	20-24
Insulin detemir (Levemir)	3-4	6-8	14	~20

Currently Available Insulin Preparations

2.2 INSULIN REGIMENS

2.2.1 ONCE DAILY REGIMEN:

In the once daily regime, long or intermediate acting insulin is given at bedtime.

o Intermediate acting Insulin - Protophane (NPH) Human Insulin

o Long Acting insulin - Glargine and Detemir

Patient Information

o This regimen is used in type 2 diabetics usually as add on to oral therapy.

o Long acting insulin should be administered every day at the same time.

o Testing blood glucose at home is essential in order to achieve optimal glycemic control and to assist with dose titration.

Advantages

- safety and efficacy has been proven in both intermediate and long acting insulin.

- a once daily regime offers a reduction in overall and nocturnal hypoglycemic events compared to NPH.

Disadvantages

- there is an increased risk of hypoglycemia.

- basal insulin does not cover glucose peaks which occur after meals and in some patients this can lead to hyperglycemia.

- there is no data for safety in pregnancy or in children younger than six years.

Contraindications

- hypersensitivity to any of the products

- Patients may experience a burning sensation with Lantus at the injection site because of the acidity of the insulin.

Information for Health professionals

o Once daily regimes are only for type 2 patients.

o Long acting insulin should be administered every day preferably at the same time.

o Patients on Levemir and Lantus do not necessarily have to snack before they go to bed unless blood glucose levels are low. With Protophane, however, patients should snack as Protophane has a peaking effect.

o If patients do not reach targets, further investigation should be done on the following;

- Suboptimal optimal dose (titration necessary)

- Non compliance with regime

- Poor diet

- Need post prandial glucose coverage (adding a short acting insulin).

2.2.2 TWICE-DAILY REGIMEN:

Biphasic insulin is used.

Patient Information

o Biphasic insulins are injected twice a day (pre-breakfast and pre-evening meal) and assume that the patient eats three meals per day.

o Additional snacks are often required between meals to avoid hypoglycemia.

Information for Health professionals

o It may be difficult to achieve optimal glycemic control.

o Hypoglycemic episodes may occur during the night followed by a fasting hyperglycemia in the morning.

o The peak action varies directly with the proportion of soluble insulin in the combination.

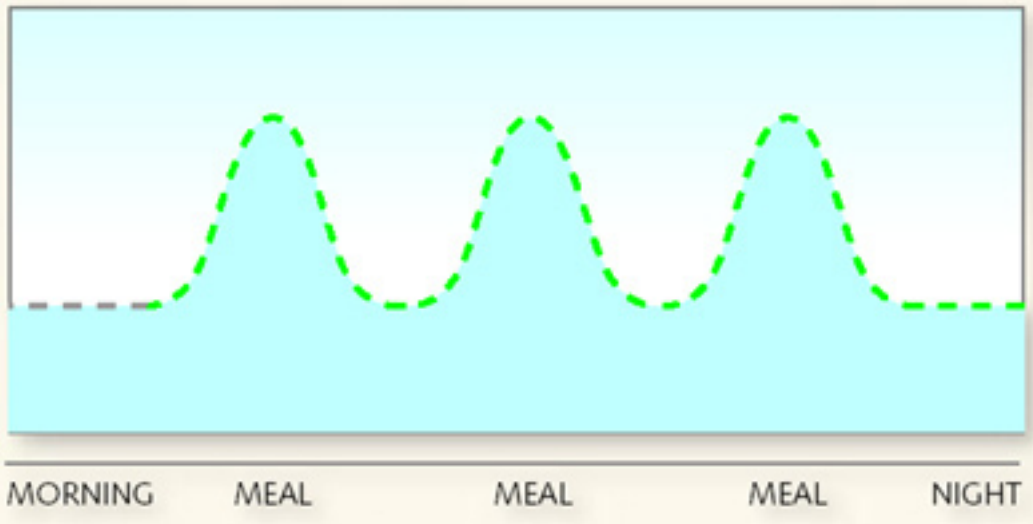
2.2.3 BASAL BOLUS REGIMEN:

Patient Information

In people without diabetes the pancreas constantly secretes a “basal” amount of insulin. This supply is increased shortly after mealtimes to cope with the increase in blood sugar. The aim of the insulin regime is to mimic the normal production of insulin as much as possible.

o A person with diabetes can imitate the above pattern by injecting short/rapid-acting insulin at mealtimes and longer-acting insulin before bedtime.

o This kind of insulin regime is also known as intensified or basal bolus.



Advantages

o It helps maintain a blood sugar level close to that seen in people without diabetes.

Disadvantage

o The use of 4 daily injections.

Information for Health professionals

The graph at the bottom of the page shows how a four times daily insulin combination works:

Advantages

o Patients learn carbohydrate counting (DAFNE principles - Dose Adjusting for Normal Eating) in order to adjust their short acting insulin dose accordingly.

o Improved flexibility, especially in coordinating insulin doses with meal size and physical exercise.

o Particularly useful for younger patients and those on shift work.

o Does not increase the risk of hypoglycemic attacks.

Disadvantages

o Number of daily injections.

o Insulin pens are generally easier to carry but are more expensive than vials and syringes.

o This regime requires greater amounts of education and effort to achieve the goals, and it substantially increases the daily cost of diabetes care.

2.2.4 CONTINUOUS SUBCUTANEOUS INSULIN INFUSION (CSII OR INSULIN PUMP THERAPY)

Patient Information

Insulin pump therapy is an option for people with type 1 diabetes.

Advantages

o Pumps can be pre-programmed, for example, to compensate for nocturnal and early morning glucose fluctuations.

o The rate of insulin absorption from pumps is more predictable than with multiple subcutaneous injections.

Disadvantages

o Pump therapy is not indicated for everyone with Type 1 DM.

o Specialist training is required.

o The patient must be very motivated to make pump therapy work.

o A trained, specialist team must be available.

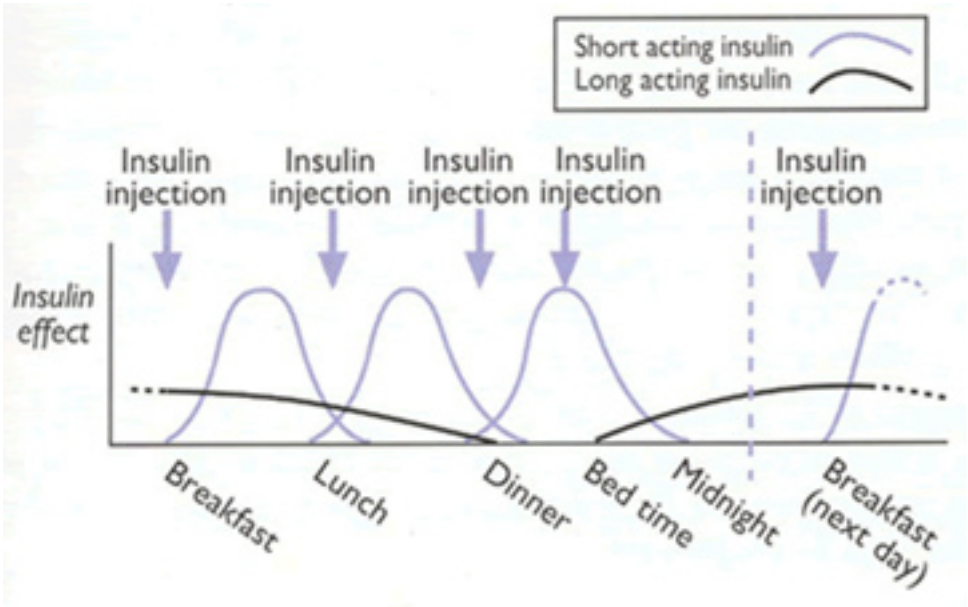
o Pump therapy is expensive.

Information for Health professionals

o Pump therapy is particularly useful for patients with recurrent hypoglycemia, unpredictable lives, delayed meals, or pre-breakfast hyperglycemia.

o The insulin used in pumps may be soluble or a fast-acting analogue.

o An adjustable basal infusion rate of insulin is given via an indwelling catheter, supplied from a syringe reservoir worn underneath the patient's clothing. The patient can then activate pre-meal boluses. Pumps can be disconnected for short periods (up to 1 hour) for activities such as swimming.



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Leigh Molloy – Profile Nursing Officer - Air Force

A childhood interest in WWII fighter pilots motivated Leigh Molloy to join the Royal Australian Air Force. Inspired by stories of the Dambusters and Sir Douglas Bader, Leigh entered her nursing degree at James Cook University (JCU) with the sole intention of becoming an Officer in the Air Force.

Now aged 32, Flight Lieutenant Leigh Molloy is a Nursing Officer in the 1 Expeditionary Health Squadron at Amberley Medical Centre outside Brisbane.

After completing a degree in Biomedical Science and deciding it wasn't for her, Leigh began a Bachelor of Nursing at JCU with the support of a Defence University Sponsorship.

Leigh briefly considered joining the Navy as a helicopter pilot but decided that nursing was a great way to get into the Air Force which was essentially a lifelong dream.

For Leigh the key benefit of the sponsorship was the financial assistance that allowed her to focus on her studies and work placement without the added stress of having to work part-time.

Already with a HECS debt from her previous degree, the opportunity for the Sponsorship was a huge advantage. Under the sponsorship Leigh was paid a salary to attend university, her HECS was paid for and most importantly there was a rewarding job at the end of it.

"Many of my friends at uni struggled to pay for accommodation and travel costs as they were so busy with juggling work placement and study, they had barely any time for a job," Leigh said. She was able to use her sponsorship money to cover the added costs and pressure of nursing work placement, which she saw as a real advantage.

On university holidays Leigh and fellow Defence University Sponsorship students made trips to various Air Force bases to get a taste of life in the Australian Defence Force. The stays were a little daunting to begin with.

"I remember trying to hide every time I saw a 'real' officer because I wasn't sure if I knew how to salute properly."

It wasn't long however, for Leigh to feel at home at the base. "The other officers made the transition from student smooth."

After finishing her nursing degree Leigh worked for two years in a civilian base hospital as an Air Force employee. She is currently the officer in charge of outpatients – a role similar to a GP practice manager – at Amberley Medical Centre.

Leigh loves her position as a Nursing Officer and has no intentions of returning to civilian nursing. While other Air Force Nursing Officers took on post grad in ICU or emergency nursing, Leigh stuck to a general nursing role that allows her to take on a more managerial position.

"Last year I deployed to Dubai for four months as a Senior Nursing Officer at the Air Force medical facility on base. It was extremely busy but a real highlight of a rewarding career," she said.

Leigh witnessed the devastation of the SEIV-36 boat explosion at Ashmore Reef first hand back in April 2009. Just hours after the explosion Leigh, an Army doctor and one other Army nurse were flown to Truscott Airfield to assist in the Aeromedical Evacuation (AME) of civilians.

During the traumatic time Leigh helped coordinate AMEs from Truscott Island to Perth. "I acted as liaison between the Air Force and the civilian nurses and doctors; we were all working together to evacuate the patients during the crisis."

While her friends from university may be working on the ward day in day out, Leigh has taken her nursing degree to the next level with the Air Force. "Signing up for the sponsorship was one of the best things I've done, it's given me access to a whole new world."

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