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Paper Title	:**RISK ASSESSMENT AND RESPONSES TO DETERIORATING PATIENTS: NURSES AND JUNIOR DOCTORS' KNOWLEDGE, ATTITUDES AND PRACTICE (KAP) IN THE EAST COAST MALAYSIA.**
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RISK ASSESSMENT AND RESPONSES TO DETERIORATING PATIENTS:

NURSES AND JUNIOR DOCTORS' KNOWLEDGE, ATTITUDES AND PRACTICE (KAP) IN THE EAST COAST MALAYSIA.

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ABSTRACT

Background: Nurses and junior doctors play an important role in providing care to patients, therefore their knowledge, attitudes and practice in assessing such patients are crucial to patient outcomes. Lately, concern about the incidence of deteriorating patientshas increased, especially in the ward setting. High numbers of intensive care unit admissions are due to the transfer of deteriorating patients from medical wards.

Purpose: To determine nurses' and junior doctors' knowledge, attitude an pratice in of assessment and treatment of deteriorating patients in medical wards, and their attitude toward,assessment of, and care practice with these patients.

Method: A cross-sectional survey was used to collect data among nurses and junior doctors (n=191)in medical wards in three Malaysian East Coast hospitalsin 2015. Data was analyzed using SPSS 22.0 for descriptive and inferential analysis.

Findings: The study had a 79.5% response rate. Nurses and junior doctors perceived a good attitude and practice in assessing deteriorating patients. However, poor knowledge on assessing deteriorating patients found. Age was associated with KAP in relation to assessing deteriorating patients, and knowledge of emergency pharmacotherapy.

Conclusion: Nurses' and junior doctors'lack of knowledge about emergency pharmacotherapy and assessing deteriorating patients,despite demonsratinggood practice and a good attitude, must be addressed. There is a need for educational strategies to ensure that nurses and junior doctors have commensurate levels of theoretical and practice knowledge.

Keywords: risk assessment, patients' deterioration, nurses' knowledge, junior doctors' knowledge, emergency pharmacotherapy

INTRODUCTION

There is an increasing trend for patients with complex conditionsto become seriously ill during hospitalization (Bright et al. 2004, Hillmanet al. 2005). Warning signs often precede serious adverse events, such as unexpected death, cardiac arrest and unplanned admission to intensive care units (Hillman et al. 2001, Buist et al. 2004). There is consistent evidence that warning signs are not always identified or acted on appropriately(Hillman et al. 2005).

About 47.4 % of Malaysian Intensive Care Unit admissions are from wards, with medical wards referring the highest number (Tong et al. 2014). Adding to that, 60% of cardiac arrests, hospital deaths, and unexpected admissions to intensive care unitsare detectable by common physiological changes such as hypotension and a fall in the Glasgow coma score (Kause et al., 2004). Nurses' lack of knowledge and skills in responding to clinically deteriorating patients places patients' lives at risk. National Confidential Enquiry into Patient Outcome and Death (2005) raised serious concerns, while Thomson et al. (2007) identified that 11% of deaths were due to lack of recognition or inappropriate treatment of patient deterioration.

Despite its importance, observations often perceived as basic and routine. The information form a vital part of the information needed to ensure safer patient care and early recognition of deterioration (Boulanger &Toghill 2009). Nurses have been reported as being unable to carry out their duties efficiently and safely due to lack of knowledge regarding the drugs they administer (Bergqvist et al. 2012). Ndosi and Newell (2009) found that 57.2% of nurses had inadequate pharmacology knowledge, and that there was a correlation between nurses' level of knowledge and level of experience. Nurses lacked knowledge of how medications work, their interactions and pharmacokinetics in comparison to having greater knowledge of indications and side effects of the drugs they administered (Ndosi& Newell 2009).

However, Shamsuddin and Shafie (2012) found that despite nurses having average pharmacological knowledge, this was not influenced by their demographic characteristics.

Data is available that demonstrates a decline injunior doctors' physical examination skills due to overdependenceonnew technology(Oliver et al. 2012). While technological investigation provides a high degree of accuracy, overuse may erode doctors' patient examination skills (Tavel 1996). Moreover, Oliver et al. (2012)highlighted that junior doctors commonly omit examination ofthe central nervous system;consequently, incomplete or inappripriate data isobtained when assessinga patient's condition.

Junior doctors, like nurses,shows lowlevels of knowledge of clinical pharmacology and therapeutics knowledge, and prescribing ability, thus putting patient safety at risk (Harding et al. 2010). There is a perception among more experienced doctors that junior doctors do not have sufficient preparation in, and knowledge about, prescribing medication (Aronson et al., 2006,Tobaiqy et al., 2007, Heaton et al., 2008). A lack of skills and knowledge of pharmacotherapy have been highlighted as factors contributing to prescribing errors (Dean et al., 2002). Despite various international studies about nurses' and junior doctors' ability to observe and safely treat patients' deterioration, no such study hasbeen reportedin Malaysia.

PURPOSE

This study aimed to broaden knowledge about this critical issue by investigating nurses' and junior doctors'attitude to, knowledge of, and practice with assessing deteriorating patients, andadministering emergency pharmacotherapy in Malaysian medical wards.

METHODS

Design and setting

A cross-sectional study design was selected for the research. A survey questionnaire was used to gather data in 10 medical wards across three tertiary hospitals on the East Coast of Malaysia during a three-month period in 2015.

Population and sampling

Nurses and junior doctors were recruited from medical wards using purposive sampling. Inclusion criteria were permanently registered nurses with a minimum of six months' working experience, or junior doctors holding the post of House Officer (HO), with a minimum of two weeks' working experience. A total of 191 participants agreed to undertake and return the completed questionnaire.

Data collection instrument

The questionnaire was adapted from Ludin, et al., (2013) and Cooper et al. (2013). It was modified and divided into three parts to meet the study's specific purpose. The first part sought participants' socio-demographic characteristics. The second part consisted of a 13-item Likert scale to determineparticipants' assessment of their knowledge, attitude and practice in assessing deteriorating patients. The third part consisted of true/false items designed to assess nurses' and doctors' knowledge of emergency pharmacotherapy. These questions were adapted and modified from Hsaio et al. (2009). Pre-testing of the questionnaire was carried out with a similar population and the Cronbach Alpha score was 0.769. The self-administered questionnaires were distributed to the nursing supervisor for each medical ward. The questionnaires were then

handed over to the nurses who were asked to return them completed to the nursing supervisor. Questionnaires for the junior doctors were given to the assistant for the Head of Medical Department for each hospital to distribute. The junior doctors were asked to return their completed questionnaires back to the Medical Department staff.

Data analysis

The Statistical Package Social Science(SPSS) software version 22 was used for analysis. Descriptive analysis was performed and the results presented as frequency, mean score and standard deviation. The association between independent variables was tested using a chi-square, with a significant p-value set at α=0.05. Relationships between the two dependent variables were tested using chi square, and Pearson's and Spearman's correlations.

Ethical considerations

The study was carried out following approval from the IIUM Research Ethical Committee (IREC), the Ministry of Health Medical Research Ethical Committee (MREC) and the participating hospitals. Participants were recruited on a voluntary basis following the signing of informed consent. Their anonymity was assured through removal of any identifying markers.

RESULTS

Demographic characteristics

The questionnaire return rate was79.5% (n=191). As shown in Table 1, participants' mean age was 30.27 (SD±5.019), with an age range between 22 and50 years. The majority were nurses (75.9%; n=145). All held a diploma (73.8%; n=141) or degree (26.2%; n=50). In terms of

working experience, 78.0% (n=149) had 1–5 years, 20.9% (n=40) had 11–20 years, and 1% (n=2) had 21–30 years. The mean for working experience was 6.71 years (±SD 5.231). The majority did not have a post basic certificate (81.2%; n=155) but almost all (92.1%; n=74) had undergone life support training, 82.7% (n=158) of whom stated that no Intensive Care Outreach Service was available in their hospital.

Table 1: Respondents' demographic profile

Variables	n	%
Age		
30 years and below	111	58.1
Above 30 years	80	41.9
Position		
Nurse	145	75.9
Junior doctor	46	24.1
Educational level		
Diploma	141	73.8
Degree	50	26.2
Working experience		
1 year - 10 years	149	78.0
11 years – 20 years	40	20.9
21 years – 30 years	2	1.1
Post basic		
Yes	36	18.8
No	155	81.2
Life support training		
BLS (Basic Life Support)	120	62.8
ACLS (Advance Cardiac Life Support)	20	10.5
BLS and ACLS	36	18.8
No	15	7.9
Intensive Care Outreach Service availability		
Yes	33	17.3
No	158	82.7

Knowledge, attitude and practice (KAP) in risk assessment

The mean score for knowledge in assessing deteriorating patients was 30.45 (SD±9.25) (see Table 2). This score was a cut off point to differentiate between good and poor knowledge. While 51.3% (n=98) scored in the poor knowledge range, only 48.7% (n=93) scored in the good knowledge range. The highest score was 61.11 (n=1; 0.5%) and the lowest 11.11 (n=3; 1.6%), with the majority of participants scoring 38.89 (n=42; 22%). The total score for attitude in

assessing deteriorating patients was 50, with a mean of 38.67 (SD±8.92), which became the cut off point for differentiating between good and poor attitude. A little over half the participants (n=105; 55%) scored in the good attitude range for assessing deteriorating patients, while 45% (n=86) scored below the mean and were classified as having a poor attitude. Scores for knowledge in emergency pharmacotherapy indicated that 53.9% (n=103) had good knowledge and 46.1%(n=88) had poor knowledge. The mean score for knowledge in emergency pharmacotherapy was 63.08 (SD±15.75).

Table 2: Knowledge, attitude and practice (KAP) in risk assessment and pharmacotherapy

Variables	n	%	Mean (SD±)
Knowledge in assessing deteriorating patient			
Good knowledge	93	48.7	30.45
Poor knowledge	98	51.3	(9.25)
Attitude in assessing deteriorating patient			
Good attitude	105	55	38.67
Poor attitude	86	45.0	(8.92)
Practice in assessing deteriorating patient			
Good practice	106	55.5	99.18
Poor practice	85	44.5	(24.90)
Knowledge in emergency pharmacotherapy			
Good knowledge	103	53.9	63.08
Poor knowledge	88	46.1	(15.75)

Table 3 shows that asking more senior staff to assess deteriorating patients scored highest (mean 8.03; SD±1.829) in the categorical mean for attitude whereas recognizing deteriorating patients clinically had the lowest score (mean 7.17; SD±2.086).

Table 3: Attitude to assessing deteriorating patients

Aspects	Mean	SD±
Recognize a patient on your ward who is deteriorating clinically.	7.17	2.086
Know when to contact a more senior member of staff about a patient who is deteriorating clinically.	7.73	2.104
Know who to contact about a patient on your ward who is deteriorating clinically.	7.77	2.193
Reporting abnormal observations relating to a deteriorating patient to a more senior member of staff?	7.97	1.927
Ask a more senior member of staff to come and assess a patient on your ward who is deteriorating clinically?	8.03	1.829

The mean score for participants' practice in assessing deteriorating patientswas 99.18 (SD ±24.90). The results showedthat 55.5% (n=106) of the participants had good practice and 44.5% (n=85) had poor practice in assessing a patient's clinical condition.

Table 4: Practice in assessing deteriorating patients

Practice in assessing deteriorating patient	Mean	SD±
Assessment of signs and symptoms of deterioration in patient's clinical condition.	7.67	2.182
Utilizing decision making skills to determine action.	7.70	2.011
Taking action to manage patient's changing situation.	7.66	2.043
Prioritizing actions based on assessment findings.	7.51	2.075
Accessing resources to assist in managing patient situations.	7.38	2.058
Reporting findings to members of the healthcare team.	7.71	2.046
Clearly communicating pertinent information about the patient's status.	7.55	2.066
Understanding rationale for actions and orders.	7.73	2.059
Seeking clarification from the physician or licensed independent provider for questions or concerns regarding the treatment plan.	7.76	2.030
Evaluating the patient's response to interventions.	7.76	1.963
Updating the plan of care to reflect the patient's current clinical condition.	7.79	1.981
Reflecting on your process of managing rapidly changing patient situations.	7.71	1.916
Extrapolate knowledge from the reflection process to apply in managing future patient situations?	7.25	2.413

Association between demographic profiles and KAP

Data showed that age was associated with knowledge (χ^2=4.276; p=0.041), attitude (χ^2=4.283; p=0.041), and practice (χ^2=8.030; p=0.005) in assessing deteriorating patients.Knowledge of emergency pharmacotherapy (χ^2=5.346; p=0.027) also had an association with age. The participants' position in the ward (χ^2=8.084; p=0.006) was significantly associated with knowledge in assessing deteriorating patients. In addition, knowledge in emergency pharmacotherapy had a significant association with working experience (χ^2= 8.984; p= 0.011), post basic certification (χ^2= 0.157; p=0.002) and life support training (χ^2= 8.150; p= 0.043)

Overall, this study has revealed nurses' and junior doctors' knowledge, attitude and practice in terms of assessing patients' deteriorating conditions, and knowledge of emergency pharmacotherapy in medical wards in East Coast Malaysia. Although 48.7% (n=93) of

participants scored “good” for knowledge, the mean score was low (mean=30.45; SD±9.25) and 51.3% scored “poor”.

DISCUSSION

The findings indicate that nurses and junior doctors have poor knowledge when assessing the condition of deteriorating patients, which is of deep concern. Such a finding should give impetus to the nursing and medical profession to improve the level of knowledge. This worrying finding is consistent with a previous study that found lack of knowledge related to patient deterioration had not been recognized or acted upon appropriately (Thomson et al. 2007). It is crucial to provide guidance to nurses so they are motivated to incorporate new knowledge, practice and trends into their nursing practice. Lifelong learning allows nurses to develop confidence and skill in service provision that is evident to patients, their families, and other healthcare practitioners (Wetters 2011).

Nurses play an important role in continuously influencing patient safety because they are responsible for providing patient care 24 hours per day and are expected to closely monitor each patient’s condition. However, this study has shown that nurses were lacking in competence, were not fully aware about when to seek help or advice, and failed to appreciate clinical urgency. These findings support earlier research by Smith, Perkins, Bullock, and Bion (2007) that revealed junior doctors were lacking in knowledge, confidence, and competence in all aspects of acute care, including the basic task of recognition and management of acutely ill patients.

The encouraging finding from this research is that 55.5% of the nurses and junior doctors scored above the mean cut off point forhaving a good attitude to assessing deteriorating patients, as measured by their perceived level of confidence and concern regarding the five items listed inTable 3. It is known that nurses’ and junior doctors’ attitudeshave an impact on patients’ care

and treatment. Patients' positive recovery is influenced by the caring attitude of nurses, with poor attitudes having the opposite effect (Institute of Health and Nursing Australia 2014).

Nurses and junior doctors tend to regard patient observation as a routine activity and not for gathering crucial information on a patient's condition (Boulanger &Toghill 2009). Certain cases have been reported where a deteriorating patient has been recognized early but no further action has been taken due tonurses' poor attitude or lack of clarity about when to call for assistance and seek advice. According to Monjamed et al. (2004), improved job performance followed by a positive outlook and job satisfaction will enhance the quality of patient care and increase productivity.

In this current study, nurses and junior doctors working on medical wards in a Malaysian East Coast tertiary hospital had good knowledge of emergency pharmacotherapy, such as administration and dilution techniques. Just over half the participants(53.9%; n=103) scored above the mean of 63.68 (SD±15.75). This finding contradicts those of Ndosi and Newell (2008), and Harding et al. (2010), which found that nurses and junior doctors have poor knowledge of emergency pharmacotherapy. However, it is in agreement with Jansen et al. (2013), who found that junior doctors had essential knowledge in contraindication, administration method and side effects of common drugs. The association between knowledge of emergency pharmacotherapy and age, working experience, post basic training and life support trainingsupports the findings of studies byAdimasu (2014) and Hsaio et al. (2009).

CONCLUSION

Nurses and junior doctors demonstrated poor knowledge of risk assessment but perceivedthemesleves as havinga good attitude and good practice in patient assessment.

However, theyneed to develop more knowledge about patient assessment rather than simply routinely observing patients. The information gathered from observation is of limited value unless it is fully utilized. In addition, knowledge, attitude, and practice should all be at a high level to ensure provisionof the best treatment and care to the patient. Knowing the early warning signs of patient deterioration, monitoring them and taking action to prevent their escalation are essential capabilities for nurses and junior doctors. Introducing the concept of 'track and trigger'(Navinan et al. 2013) into nurse and doctor training, as well as in risk assessment practice, in combination with the introduction of ICU Outreach services, should improve nurses' and doctors' performance and result in better patient outcomes.

LIMITATIONS

The small sample size and limited geographical distribution limit generalizability of the results. The number of nurses (n=141) in the study compared to the number of junior doctors (n=50) possibly skewed the results. This may affect the validity of the study and this is something to consider for future research.The results may be biased because the meaning of questions could be understood differently by different participants (communication barriers between researcher and participants). However, pre-testing reduced the possibility of bias.

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