

Knowledge, Attitude and Practice of Nurses in Administering Oral Medication at Medical Ward, Universiti Kebangsaan Malaysia Medical Centre

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ABSTRAK

Pemberian ubat merupakan satu aspek dari peranan jururawat dalam bidang kejururawatan. Bersama dengan pelbagai peranan jururawat, mereka juga perlu mempunyai pengetahuan yang mencukupi dan amalan yang baik. Tujuan kajian ini adalah untuk mengetahui tahap pengetahuan, sikap dan amalan jururawat dalam pemberian ubat melalui mulut dan juga untuk menilai samada pengetahuan jururawat, sikap dan amalan berkaitan dengan pengalaman bekerja dan pendidikan profesional. Satu kajian rentas telah dijalankan ke atas 40 jururawat yang berkerja di wad medikal, Pusat Perubatan Universiti Kebangsaan Malaysia. Soal kaji selidik digunakan untuk mengukur tahap pengetahuan dan sikap jururawat dan teknik pemerhatian secara langsung dengan menggunakan "senarai semak" untuk mencatat amalan jururawat. Min skor untuk pengetahuan adalah 13.8, sikap (16.4) dan amalan (10.7) dan berada di antara taburan purata. Tiada perbezaan signifikan di antara pengetahuan dan amalan jururawat dengan pengalaman bekerja dan pendidikan profesional. Walaubagaimanapun pengaruh keatas pengalaman bekerja dan kursus pos basik keatas sikap jururawat dalam pemberian ubat melalui mulut didapati signifikan ($p=0.045$). Jururawat di wad medikal, Pusat Perubatan Universiti Kebangsaan Malaysia didapati mempunyai tahap pengetahuan dan sikap yang sederhana dalam pemberian ubat melalui mulut. Kajian ini mencadangkan pengalaman kerja tidak mempengaruhi pengetahuan dan praktis yang baik dalam pemberian ubat melalui mulut.

Kata kunci: Pemberian ubat, jururawat, pengetahuan, sikap, amalan

ABSTRACT

Drug administration is an integral part of nurses role in nursing practice. In relation to their diverse roles, nurses are required to have adequate knowledge and good practice. The purpose of this study is to examine the level of knowledge, attitude and practice of nurses in the medical wards administering oral medication and to assess whether nurse's knowledge, attitude and practice is associated with working experience and professional education (post basic training). A cross-sectional study

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was conducted on forty (40) nurses working in the Medical wards in Universiti Kebangsaan Malaysia Medical Centre (UKMMC). Questionnaires were used to measure the level of knowledge and attitude of nurses and a direct observation technique with checklist to record the practice of nurses. The mean score for knowledge (13.8), attitude (16.4) and practice (10.7) were all within average distribution. No significant difference was found between knowledge and practice of nurses with working experience and post basic training. However, the influence of working experience on attitude of nurses in serving oral medication was found to be significant ($p= 0.045$). Nurses in medical ward, Universiti Kebangsaan Malaysia Medical Centre, were found to possess an average level of knowledge and attitude in administering oral medication. In addition, this study suggest that work experience of nurses has no influence on knowledge gain and good practice in administering oral medication.

Key words: drug administration, nurses, knowledge, attitude, practice

INTRODUCTION

Drug administration is an integral part of nurses' role and is performed in their everyday nursing practice. The practice in drug management includes preparing, checking and administering medications, continuous updating of knowledge in medications, monitoring the effectiveness of treatment, identifying side-effects and providing medication education (Shea, 1999). With regards to their diverse roles in providing medication and care, nurses are required to have adequate knowledge on the therapeutic uses, normal dosage, side-effects, correct route, precautions and contra-indications of drugs. Nurses are therefore, responsible in ensuring that the medications administered according to standard practice as they are accountable for their own practice.

Medication error is reported to be a common problem in the clinical settings. Nurses require the essential knowledge on pharmacology, portray a positive attitude and competence in medication administration to prevent any error. Adequate knowledge of medication and good practice will definitely assist nurses in administering medications effectively and correctly.

Studies have shown that knowledge in pharmacology among the nurses were low and inadequate. (Clancy et al. 2000; Latter et al. 2000; Manias & Bullock, 2002b). Boggs et al. (1998) assessed nurses' pharmacology knowledge by testing their knowledge of three commonly prescribed drugs. The mean score in knowledge on pharmacology was only 46%. Findings showed that nurses lacked sufficient knowledge on dosages, mechanism of action and pharmacokinetics. The highest knowledge levels were found for clinical indicators for the drugs and side-effects. Findings also showed that medication knowledge tends to increase with educational level but is not related to experiential background.

Ivel et al. (1996) also surveyed the actual and self-rated pharmacology knowledge of nurses. The average test score produced was 56%. There was found to be a relationship between test scores and the number of years of practice. Nurses' knowledge on medication was inadequate, especially pertaining to the drug and its side-effects (Alibhai et al. 1999; Henderson & Zernike 2001).

Manias and Bullock (2002a) indicated that registered nurses in Australia lacked in-depth knowledge in pharmacology and

experience difficulties in understanding and demonstrating pharmacological concepts. A number of studies (Leonard & Jonett 1990; Courtenay 1991 and Ives et al. 1996) have found that nurse's knowledge level on both pharmacology and medical sciences to be inadequate. Gerry & Helen (2003) reported that length of experience and level of professional education was associated with level of knowledge in the administration of medications. Having extra educational qualifications among nurses were found to have contributed to a better knowledge of medications. Markowitz et al. (1981) found out that nurses working on the day shift had greater knowledge of medication than nurses who worked on night shift. Mattan (1998) revealed that administering medicine effectively was a feature of practice but it lacked quality, which is due to poor knowledge in pharmacology and practice. Manias et al. (2004) indicated that nurses possessed the necessary knowledge and skills in medication administration such as monitoring effects of medication, assessing and evaluating patient's condition prior to medication administration. However, the nurses were found to have poor attitude as most nurses did not evaluate or monitor patient's condition following the administration of medications.

Many medication errors committed were found to be based on pharmacological knowledge, attitude and skills in medication administration. Statistics (1999-2000) cited by Gerry and Helen (2003) has shown that 5.41% of the medication errors occurred were due to the failure in following the prescription – wrong dose, wrong route and poor skills in administering drugs. Gladstone (1995) also identified knowledge, skills, breakdown in communication and failure to follow policy, as the main cause of medication error.

Nurses also play an important role in medication education. Mattan (1998) revealed that medication education is also

a feature in nursing practice but it lacked quality as nurses lacked knowledge and confidence and therefore were unable to provide medication education to patients. Syred (1981) and Elkind (1982) have suggested that nurses fail to contribute to patient education due to the lack of knowledge and skills in pharmacology.

To determine whether registered nurses are equipped with the necessary knowledge, skills and confidence to manage their patient's medication, it is therefore crucial to explore and examine their knowledge, attitude and skills. There is no available data in Malaysia regarding nurses' knowledge, competence and attitude in medication administration. The aim of this study was to measure the level of knowledge, skills and practice of nurses in the medical ward in administering oral medication and whether nurse's knowledge, attitude and practice has any association with working experience and post basic training.

MATERIALS AND METHODS

A cross-sectional descriptive design was used in this study. A sample of 40 registered nurses, working in the medical wards in UKMMC was recruited to participate in this study. Reasons for conducting this study on nurses working in medical ward was due to the various types of medical drugs used in patients with medical problems and high incidence of medication errors reported. UKMMC is a teaching hospital and training centre for nurses and doctors and therefore nurses working in this hospital are required to possess a good level of pharmacological knowledge and good attitude in medication administration.

A pilot study was conducted on ten nurses working in surgical wards to assess the reliability of the questionnaires before the actual study. Nurses who participated in the pilot study were excluded from the main study.

Instruments used in this study were in the form of Checklist and Questionnaires. Checklist was used as the researcher used the direct observation method to assess the level of practice of participants. The checklist consisted of the required activities to be performed in the administration of medication that were derived from the "Fundamental of nursing books" and redesigned by the research team.

Instrument 1 - Checklist consisted of two sections - demographic data and the medication skills to be performed by nurses. Demographic data consisted of years of experience and professional education. Professional education is described as either Diploma or Diploma with Post Basic (Advanced Nursing). A respondent with more than 2 years of working experience is described as experienced & less than 2 years as non-experienced.

Instrument 2 - Questionnaires consisted of 2 sections: Section A on pharmacology knowledge & Section B - questions on attitude of nurses in medication administration.

All data were coded and entered into SPSS (The Statistical Package for Social Sciences) for analysis. An independent t-test was used to determine the influence of working experience and post basic course on knowledge, attitude and practice. Distribution of scores in knowledge, attitude and practice were rated as high/good, average and low/poor. Knowledge scores >17 were rated as high knowledge, between 11-17 average knowledge, and <11 as having poor knowledge. Attitude scores >18 were deemed as good attitude, scores between 13-18 as average attitude and <13 as poor attitude. Practice scores >12 were deemed as good practice, 7-12 as average and <7 as poor practice. This

reference range was developed from the number of questionnaires asked and scores given for each answer.

RESULTS

The characteristics of the 40 respondents are presented in Table 1. Eight (8) nurses were found to have an experience of less than two years and majority (n=32) as having experience of more than two years. A total of ten (25%) nurses were found to have post basic courses and 30 (75%) had only Diploma qualification.

Table 1 : Demographic characteristics of respondents

Characteristics	n = 40	%
Professional Education		
Diploma	30	75
Diploma with Post Basic	10	25
Length of Working Experience		
1 Year	4	10
2 Years	4	10
3 Years	8	20
4 Years	12	30
5 Years	8	20
6 Years	4	10

Nurses skills in medication administration

Six activities commonly performed in relation to medication administration was observed (Table 2) and marked according to the checklist.

Prior to serving medicine, 67.5% practiced hand washing and all nurses (100%) prepared their medication trolley. 77.5% served medication at the correct time and 87.5% practiced correct method of serving oral medication. 50% of the nurses ensured that patients swallowed the medication immediately upon serving, whereby the other 50% was found to have either placed the medication on the patient's locker or gave the medications to the cares. All nurses (100%) documented the medications served.

Nurses' knowledge in Pharmacology

Questions related to Pharmacology knowledge as shown in Table 3 was answered by all the nurses. On the question of which medication administration was considered an oral route, all knew sublingual (100%) was an oral route. Only 27 nurses (67.5%) identified buccal as an oral route. However, topical (100%) and transdermal (5%) was also considered as an oral route by the nurses.

In response to questions asked on the serving of special category of medications such as antibiotics, lozenges, GTN and aspirin, 50% of the nurses agreed antibiotics should be served after meals and the others (50%) before meals. On how lozenges should be taken, 55% reported that lozenges should be chewed slowly and 45% stated it should be swallowed as any other tablets. On whether GTN is taken sublingually, 90% of the nurses gave a correct answer. 52.5% nurses indicated Aspirin is to be crushed and dissolved in water before serving. On the identification of drugs classified under antibiotic, all nurses knew Metronidazole was a fungal antibiotic. However, there were a handful of nurses who identified Methotrexate (7.5%), Metoclopramide hydrochloride (10%) and Methylprednisolone (7.5%) as antibiotics, which is incorrect.

All nurses indicated that antibiotics should be served at the correct time. Nurses (100%) also indicated that medication in the liquid form is easily absorbable compared to tablets. Nurses re-

membered the main important five rights (Right Patient, Right Drug, Right Dosage, Right Time and Right Route) in serving medication with ease, which forms the foundation for safe practice.

Nurses Attitude in Medication Administration

Ten items as described in Table 4 were used to measure nurses' attitude in medication administration. Nurses agreed that pharmacology knowledge should be upgraded from time to time. All agreed it is nurses' responsibility to serve medications however busy they are, but more than half of the nurses said they will ask for assistance from their colleagues to help prepare and serve the medications. All nurses indicated, they will not hesitate to ask nurse aids to serve the medications. 100% indicated they will not hesitate to place patient's medication on the locker if such a situation arises. However, 100% strongly indicated that they will follow up their patients to ensure that they have taken their medication even after completing their medication round. 65% of nurses indicated that they will leave their medication trolley to answer phone calls. Nearly half of the nurses said they will not mind to administer drugs prepared by others. Nurses were asked on what they will do if they encounter problem or confusion about a drug; 90% of the nurses indicated that they will get assistance from colleagues, will let it remain as it is (12.5%) and seek pharmacist assistance (100%). Hundred

Table 2 : Nurses Skills In The Serving Of Oral Medication In Percentage (n=40)

Skills	Yes (%)	No(%)
Washed hands prior to serving medications	67.5	32.5
Prepare medication trolley	100	0
Serve medication at the correct time	77.5	22.5
Practice correct method of serving oral medication	87.5	12.5
Ensure patients swallow the medication immediately	50	50
Document the medications served	100	0

Table 3 : Nurses' knowledge in serving oral medication (n=40)

Question	Yes (%)	No (%)
Identify which is an oral administration		
a) Topical	100	0
b) Sublingual	100	0
c) Buccal	67.5	32.5
d) Transdermal	5	95
Guidelines when serving special medications.		
a) Antibiotic is given after meals	50	50
b) Lozenges are to be chewed	55	45
c) GTN is given sublingually	90	10
d) Aspirin is to be crushed & dissolved in water	52.5	47.5
The following is an antibiotic?		
a) Methotrexate	7.5	92.5
b) Metronidazole	100	0
c) Metoclopramide	10	90
d) Methylprednisolone	7.5	92.5
Drugs administered intravenously act rapidly than those administered locally	45	55
Administer irritating drugs with food to decrease GI discomfort	100	0
Right time is important in serving antibiotics	100	0
Liquid medication is easily absorbed than tablets	100	0
Important principles in serving medications		
a) Ensure Right Patient, Right Drug and Right Dosage	100	0
b) Ensure Right Time, ensure Right Route	100	0

percent of the nurses indicated that hand washing is important prior to serving medication.

DISCUSSION

Medication administration is a daily basic activity in nursing practice and nurses need to have sufficient knowledge, attitude and competency to perform these tasks. The findings of this study suggest that nurses do have sufficient pharmacological knowledge but only in certain aspects of pharmacology. This is clearly reflected in the test scores achieved. These findings are similar to the study done by King (2004) and Coombs et al. (2003) and thus support the need for pharmacology knowledge in practice. Knowledge on drug administration is li-

mitted. 45% of the respondents did not know that lozenges should be chewed and 33% of the nurses did not know that the buccal route is also linked to an oral method of drug administration, and placed in the buccal region. The term "topical" means local application to the skin but 100% of the nurses indicated that "topical" is an oral method.

Nurses need to improve their knowledge especially on the different routes of medication administration as responsibility for correct administration of medication lies in the hands of nurses. The purpose of giving an antibiotic before meals is for better absorption. Most of the antibiotics are to be taken before meal time except for the exceptional ones which irritate the mucous membrane of the stomach. However, in this study, 50% of

Table 4 : Nurses' attitude when serving oral medication (n=40)

Questions	Yes (%)	No (%)
Important for nurses to upgrade pharmacology knowledge from time to time	100	0
You have to serve medication to your patients and the ward is busy. What will you do?		
a) Perform serving of medicine single-handedly	90	10
b) Ask help from colleagues	52.5	47.5
c) Ask help from nurse aids	0	0
d) Will place the medication on patient's locker	0	0
Responsibilities when serving medication		
Will stay with patient until oral drug have been swallowed	100	0
Ask for assistance from colleagues to answer phone call when serving medication	65	35
Will administer drugs prepared by others	42.5	57.5
Hand washing is important prior to serving medication	100	0
When encountering problem or confusion with drug's name or dosage		
a) will get help from colleagues	90	10
b) will not take any action	12.5	87.5
c) call up ward pharmacist	100	0
Medication education reduces medication errors	100	0
Medication education increases patient's knowledge	100	0
Medication education delays nurses work	22.5	77.5
Will inform the Head nurse if a medication error occurs	100	0
Scenario:		
While you are serving medicine, one of the patient's tablet fell onto the floor. The action you will take is: Discard the tablet and take a new one	100	0

Table 5 : Distribution of scores of respondents on knowledge, attitude & practice in serving oral medication

	Mean Scores (n = 40)	Distribution
Knowledge	13.8 (11-17)	Average knowledge
Attitude	16.4 (13 – 18)	Average attitude
Practice	10.7 (7 – 12)	Average Practice

the nurses are ignorant that antibiotics are to be served before meals unless indicated so. GTN is a common drug used in medical wards and nurses have

been taught to administer it sublingually, however, it is a surprise, as 10% of nurses who are working in the Medical ward failed to know this. Methotrexate and Methylprednisolone has been identified as an antibiotic by 100% of the nurses which is not correct. It indicates a limited knowledge on “action of drugs” as nurses did not produce high scores in some of these “must know” pharmacology questions. It is important as they are commonly prescribed and have learnt it during their basic training. Low pharmacology knowledge among nurses can lead to medication errors as safe medication administration is based on knowledge, attitude and sound clinical judge-

Table 6 : Influence of work experience and post-basic training on Knowledge, Attitude & Practice in administering Oral Medication

Variables	Knowledge		Attitude		Practice	
	t	P	t	P	t	P
Nurses with and without working experience	0.677	0.503	-2.071	0.045	-0.427	0.672
Nurses with post basic and without post basic	0.826	0.414	-0.576	0.568	0.337	0.738

• Significant= p<0.05 (Independent t-test)

ment. Findings of this study are similar to that of Jeannes and Taylor (1992) and Ashirt (1993), and comments have been made on the limited knowledge of pharmacology among registered nurses. This issue needs to be addressed urgently or else patient safety will be affected and quality patient care will be compromised.

Attitude and practice is somehow said to be co-related in previous studies, but this is not the case here as a flaw was detected (Manias & Bullock 2002a; Ivel et al. 1996). In ensuring patients swallowed the medication immediately, the same question was tested in attitude and practice and 100% nurses agreed that they would stay with patients until medication is swallowed but the test score did not commensurate with real practice. Generally, nurses showed some responsibility in practicing safe drug administration. Findings in relation to nurses' attitude and skills in medication administration were found to be sufficient. However, this finding is parallel with results obtained by Manias et al. (2004) and Shea (1999).

Years of experience did not show any influence on the knowledge and practice of nurses except on attitude, which is similar to the study done by Ivey et al. (1996). Findings regarding pharmacological knowledge and practice are related to educational level and are similar to the findings of Boggs et al. (1998).

LIMITATIONS

A consensus could not be reached to indicate that knowledge, attitude and practice of nurses is really of an average level in actual practice, even though the

findings of this study indicate so, as questions measuring knowledge were simple and lacked depthness. Furthermore, it did not cover many aspects of pharmacology. Mathematical skills which is a prerequisite to the performance of many nursing functions such as medication calculation was not tested here. In relation to nurses' skill, nurses could have performed well as they were aware of the presence of the researcher.

CONCLUSION

The findings of this study concluded that nurses in Medical ward, UKMMC were found to have generally an average level of knowledge, practice and attitude in administering oral medication. Despite the fact that it is of adequate standard, it is not sufficient as the nurses are qualified nurses working in a teaching hospital and teaching student nurses is part and parcel of nurses' role in nursing practice. Nurses need to continually update their pharmacological knowledge from time to time in order to be competent in the administration of drugs.

REFERENCES

Alibhai, S.M.H., Han, R.K. & Naglie, G. 1999. Medication education of acutely hospitalized older patients. *Journal of General Internal Medicine* **14**: 610-616.

Ashurt, S. 1993. Nurses must improve their knowledge of pharmacology. *British Journal of Nursing* **12**: 608-608.

Boggs, P., Brown-Molnar, C.S. & Delapp, T.D. 1988. Nurses Drug Knowledge. *Western Journal of Nursing Research* **10**(1): 84-93.

Clancy, J., McVicar, A. & Bird, D. 2000. Getting it right? An explanation of issues relating to the

- biological sciences in nurse education. *Journal of Advanced Nursing* **16**: 1110-1116.
- Coombs, T., Deane, F.P., Lambert, G. & Griffiths, R. 2003. What influences patients' medication adherence? Mental health nurse perspectives and a need for education and training. *International Journal of Mental Health Nursing* **12** (2): 148-152.
- Courtenay, M. 1991. A study of the teaching and learning of the biological sciences in nurse education. *Journal of Advanced Nursing* **16**: 1110 -1116.
- Elkind, A.K. 1982. Nurses view about cancer. *Journal of Advanced Nursing* **7**: 43-50.
- Gerry, A. & Helen, K. 2003. Adverse events in drug administration: a literature review. *Journal of Nursing Management* **11**: 130 -140.
- Gladstone, J. 1995. Drug Administration Errors: A study into the factors underlying the occurrence and reporting of drug errors in a distinct general hospital. *Journal of Advanced Nursing* **22**(4): 268-637.
- Henderson, A. & Zernike, W. 2001. A study of the impact of discharge information for surgical patients. *Journal of Advanced Nursing* **35**: 434-441.
- Ives, G., Hodge, K., Bullock, S. & Mariott, J. 1996. First year RIV's actual and self-rated pharmacology knowledge. *Australian Journal of Advanced Nursing* **14**: 13-19.
- Jeannes, A. & Taylor, D. 1992. Stopping the drugs trolley. *Nursing Times* **88**: 27-29.
- King, R.L. 2004. Nurses perceptions of their Pharmacology educational needs. *Journal of Advanced Nursing* **45**(4): 392-400.
- Latter, S. Rycroft-Malone, J., Yerrell, P., Shaw, D. 2000. Evaluating educational preparation for a health education role in practice: the case of medication education. *Journal of Advanced Nursing* **32**:1282-1290.
- Leonard, A. & Jowett, S. 1990. Charting the Course: a Study of the Six ENB Pilot schemes in Pre-Registration Nurse Education. National Foundation for Educational Research in England and Wales, London
- Manias, E. & Bullock, S. 2000a. The educational preparation of undergraduate nursing students in pharmacology: Clinical nurses/ perceptions and experiences of lecturers and students. *International Journal of Nursing Studies* **39**: 757-769.
- Manias, E. & Bullock, S. 2000b. The educational preparation of undergraduate nursing students in pharmacology: Clinical nurses/ perceptions and experiences of graduate nurses medication knowledge. *International Journal of Nursing Studies* **39**: 773-784.
- Manias, E., Aiken, R. & Dunning, T. 2004. Medication management by graduate nurses: Before, during and following medication administration. *Nursing & Health Sciences* **6**(2): 83-91.
- Markowitz, J.S., Pearson, G., Kay, B.G., Loewenstein, R. 1981. Nurses, Physicians and Pharmacists: their knowledge of hazards of medications. *Nursing Research* **30**(6): 366-370.
- O'Shea, E. 1999. Factors contributing to medication error: A literature review. *Journal of Clinical Nursing* **8**(5): 496 -504.
- Syred, M.E.J. 1981. The abdication of the role of health education by hospital nurses. *Journal of Advanced Nursing* **6**: 27-33.