A pilot study—an action research to acquire clinical skill

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Abstract

Action research in classrooms is a challenge to novice lecturers in health education. Technical action research is a model of action research which involves the main researcher as identifier of research problem and proposing an intervention. This study presents a brief view on the technical action research in developing clinical competency in undergraduate dental students of Universiti Kebangsaan Malaysia. Thirty seven students of final year undergraduate dental program were divided into two groups. Action research approach was used to acquire clinical competency by facilitating learning through lecture and giving verbal feedback. All students in action research group diagnosed their problem and suggested action to improve their clinical skills. The outcome of the action is reported as significant improvement in prescription writing. The findings support the suitability of using action research approach as an appropriate method as to improve the clinical skill in undergraduate dental students.

Key words: Action research; clinical skill; prescription; undergraduate student

1. Introduction

Action research is a challenge to novice teachers and researchers in health education research. In recent era, it has captured as a powerful tool for simultaneously improving the health practice and education methods. Action research covers a spectrum of research. Its definition varies in different contexts. Most definitions characterize it as (i) focusing on change and improvement (ii) involving the practitioners in research (iii) looking at those facts which arise from practice and (iii) being a cycling process of collecting, feeding back and reflecting on data (Amanda et al., 1999).

A raring in dentistry, action research is studied in social sciences where it has been used to facilitate the change and to improve the clinical services provided. There are a few published studies to improve the clinical competency of undergraduate dental students. Medications are part of dental practice. Proper information about recipients

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Prescription writing is an important skill to be acquired by undergraduate dental students upon their graduation. Recipient (patient) information in writing a prescription is provided at the beginning, followed by drug related information. In the end, prescriber’s information is mentioned. The lack of any element in a prescription is taken as incomplete prescription or prescription errors. In US, prescription errors were the eight leading cause of death (Kohn, Corrigan, & Donaldson, 2000). Prescription errors are reported to affect considerable percentage of patients admitted to hospitals (Franklin, Vincent, Schachter, & Barber, 2005). Among these patients, old age patients are at a higher risk of medication errors and experience greater harm because of fatal errors (Zaidenstein et al., 2002). Most studies show that prescription errors are made by junior doctors as they usually write the prescriptions (Stubbs et al., 2006; Dean et al., 2002; Bordun & Butt, 1992).

Prescription writing is one of the common procedures in dental practice which is performed for the wellness of dental patients. Prescribing is a practice that is undervalued in dental curriculum and fewer efforts are devoted to this art which has the potential to cure but may also cause great harm if carried out incorrectly and unsafely. Medication skill is formerly not taught in dental curricula. Undergraduate students learn this skill from their senior colleagues, junior doctors and clinical instructors/teachers while doing scheduled clinical posting. Proper teaching and training of the undergraduate dental students on prescription writing is a requisite solution. Studies involving action research in undergraduate dental students, prospective prescribers, are limited in the literature. As part of the improvement of training and teaching module of the faculty, this action research aimed to facilitate the change and improve the learning to teach prescription writing skill in undergraduate dental students.

Susman (1983) had presented the action research cycle with five phases. However, a modified model by Maclsaac (1995) had four action steps; Planning, Action, Observation, and Reflection. In this cycle, initially, a problem is identified and data is collected for further diagnosis. Several possible solutions are postulated and a single plan of action is implemented. Data on the results of the intervention are collected and analysed findings are interpreted on the success of the action. Problem is reassessed and the process begins another cycle until the problem is solved. For this pilot action research, we followed the Susman’s cycle (Figure 1)
2. Diagnosing a Problem

Majority of undergraduate dental students acquire a limited prescribing skill (Rauniar et al., 2008). Data on the prescriptions written by students were obtained. In undergraduate dental training, students are not allowed to prescribe medications to real patients. But they were given simulated dental problems to prescribe medications for. Data comprising of prescription writing on plain piece of papers for two different patients with irreversible pulpitis was collected. Lack of prescription writing skill was noticed as a problem as none of the prescription written was a complete prescription. Students were given verbal feedback. From this observation, an idea of action research arose to be carried out. Thirty seven final year undergraduate dental students from faculty of dentistry, University Kebangsaan Malaysia participated in the study. Technical action research model was adopted. To bring the complete prescription correct write up in undergraduate students was set as aim of the study. The aim of this study was to teach correct prescription during in undergraduate dental students.

3. Planning

Students and lecturer discussed the feedback and identified their problem on how to write a proper, accurate and complete prescription. As a plan of action research, various options were brought under consideration. Special lecture, computer training such as web based teaching and workshops for prescription writing were a few options. Many health care centres have adopted the computer based prescribing programs to reduce the chance of making prescription errors but not all centres can be equipped with this faculty because of economic constraints especially in the remote areas and in the developing countries. Computer assisted learning, through web page designed, is an effective way of to practicing prescription writing had many technical hurdles. A special lecture on prescription writing was found to be suitable and appropriate method within the limits of the available resources.

4. Taking Action

Participating students in the study were divided into two groups, the experimental and the control group. The students in the experimental group were given verbal feedback on their prior written prescriptions. They were thought on how they could improve their prescription writing. The appropriate medications for diseases require an intervention by medical teachers from time to time during their clinical years such as special module on prescribing manner or arrangement of 1-2 days workshops during academic years to prevent prescribing errors. One hour lecture was conducted by a novice lecturer to students of action group. Lecture contents were primarily an essential part of a prescription and their significance related to patient’s safety. At the end of the lecture, students were allowed to ask questions. Control group had no briefing on prescription writing. Cases associated with irreversible pulpitis were given to both the experimental and the control group to write prescription.

Eighteen students of experimental group wrote a total of fifty four prescriptions for irreversible pulpitis for child, pregnant woman and man. All prescriptions were marked using WHO guidelines (DeVries et al., 1995) and prescription elements of experimental group were compared with control group.

5. Analysing Data

Twelve variables were assessed in all prescriptions. SPSS version 19 was used to analyse the data including frequency, percentage and chi-square values to obtain information as comparison. The data were analysed by choosing ‘Patient’s name, age, sex , date of issuance, symbol R, ‘take thou’, drug name (legible), dose, strength of medicine, direction for use, signature of prescriber, date with prescriber’s signature, prescriber’s registration, and instructions for refill’ as nominal variables to check the completeness of the prescription.

Students of experimental group improved in all elements of prescription. The improvements ranged from 0.3 to 75.3 percent in various elements of prescriptions (Table 1).
6. Reflection

After the lecture data were compared to find the effect of action (lecture) on students from experimental group. Significant improvements were observed in prescriptions writing in terms of providing the patients related information and prescribers’ information. Overall completeness of prescription was observed. This indicated that there was an impact of giving lecture on prescription writing to students (Table 1).

7. Observation

Comparing the experimental group with the control group, the data showed that there was significant improvement in action group in provision of the symbol Rx ‘take thou’ (39.8%, \( P = 0.001 \)), prescriber’s signature (75.3%, \( P = 0.001 \)), date with prescriber’s signature (59.5%, \( P = 0.001 \)), prescriber’s registration (30.5%, \( P = 0.001 \)). In addition, there was also improvement in prescribing skill of experimental group, by providing ‘date of issue (13.9%)’, legibility of medicine (7%), refill instruction (12%), direction to use (0.3%) but the improvement was statistically insignificant when compared with the control group. Both groups showed equal performance in prescription writing by providing “Patient’s name, age and sex, legibility and dose of medicines (Table 1). Problem-based questions requiring drug prescriptions were used to gauge the overall effectiveness of the lecture. Experimental group was found to have improved in their prescription writing. Monitoring of performance over the extended period of time was a limitation of the study.

8. Reflection of Action Research (Summary)

If the generated data from the feedback and after action (lecture) are considered, using an action research model involving undergraduate dental students (practitioners) was successful. It promoted and initiated the changes required to reach students regarding prescription writing. Involvement of feedback process and requisite action were associated with the action research. Majority of students viewed it as a method to improve their clinical skill as they were involved in the research process. Most of them collected the feedback themselves.

This pilot study was more ‘technical’ than ‘emancipatory’ in terms of spectrum of research methodology. Traditional or positivist model of action research are described as experimental /technical. This study was at technical / experimental end of the spectrum of action research as the participants reflected their views on improving their practice in prescribing medications to dental patients. There are many studies outside medicine on how action

| Elements of Prescription | Action group (n=54) | Control group (n=57) | Improved | Chi-Square Significant | \( P < \) |
|--------------------------|---------------------|----------------------|-----------|------------------------|--------|
| Date of issue*           | 1                   | 9                    | 15.8      | 13.9                   | 6.57   | 0.010 |
| Symbol ‘Rx’              | 24                  | 48                   | 84.2      | 39.8                   | 19.24  | 0.001 |
| Medicine legible*        | -                   | 4                    | 7         | 7.0                    | -      | -     |
| Direction to use medicine*| 51                  | 54                   | 94.7      | 0.3                    | 0.005  | 0.945 |
| Refill instruction*      | 39                  | 48                   | 84.2      | 12                     | 2.35   | 0.125 |
| Prescriber’s signature   | 1                   | 44                   | 77.2      | 75.3                   | 65.29  | 0.001 |
| Prescriber’s date        | 16                  | 48                   | 84.2      | 54.6                   | 33.83  | 0.001 |
| Prescriber’s registration| 29                  | 48                   | 84.2      | 30.5                   | 12.14  | 0.001 |
research being successful in promoting change and bridging gap between research and practice (Whyte, 1991; Titchen & Binnie, 1993; Zuber-skerritt, 1996).

Ogunbodede et al. (2005) indicated that the prescription errors ranged from one to seven in a single prescription. In this pilot study, error range was observed from 4-8 per prescription. Error rate varies from study to study due to different methodologies and subjects variations. Kuan et al. (2002) found that each prescription had one or more than one error. Overall, experimental group was found to be better as compared to control group.

It is concluded that action research approach is a useful method involving the learners in the evaluation of their clinical competency promoting their decision making.

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References

Amanda, H., Mitch B., Nicola C., Anthony A., & Idris W. (1999). Action research: a useful method of promoting change in primary care? Family Practice 16(3):305-311.

Bordun, L.A., & Butt, W. (1992). Drug errors in intensive care. J Paediatr Child Health 28(4): 309–311.

Dean B., Schachter, M., Vincent, C., & Barber, N. (2002). Prescribing errors in hospital inpatients: their incidence and clinical significance. Qual Saf Health Care 11:340-344.

DeVries, T.P.G., Henning, R.H., Hogerzeil, H.V., Fresle, D.A. (1995). Guide to good prescribing- a practical manual. World Health Organization. Geneva /DAP/94.1. P51-55.

Elkind A., Watts, C., Qualtrough A., Blinkhom, A. S., Potter, C., Duxbury, J., Blinkhom, F., Taylor , I., Turner, R. (2007). The use of outreach clinics for teaching undergraduate restorative dentistry. Br Dent J 203 :127-132.

Franklin, B.D., Vincent, C., Schachter, M., & Barber, N. (2005). The incidence of prescribing errors in hospital inpatients: an overview of the research methods. Drug Saf 28: 891–900.

Kohn, L.T., Corrigan J.M., Donaldson, M.S. (2000). eds; for the Committee on Quality of Health care in America, Institute of Medicine. To Err Is Human: Building a Safer Health System. Washington, DC: National Academy Press; 2000.

Kuan Kuan Mun Ni, Chua Siew Siang, & Mohamed Noor bin Ramli. (2002). Noncompliance with prescription writing requirements and prescribing errors in an outpatient department. Malaysian Journal of Pharmacy 1(2):45-50.

Maclsaac, D. (1995). An introduction to action research. http:// www.phy.nau.edu/dannmac.html.

Ogunbodede E.O., Fatusi O.A., Folayan M.O., Olayiwola G. (2005). Retrpspective survey of antibiotic prescriptions in dentistry. J Contemp Dent Pract 6(2):64-71.

Rauniar, G.P., Roy, R.K., Das B.P., Bhandan G., & Bhattacharya, S.K. (2008). Prescription writing skills of pre-clinical medical and dental undergraduate students. J Nepal Med Assoc. 47(172):197-200

Stubbs, J., Haw, C., & Taylor D. (2006). Prescription errors in psychiatry – a multi-centre study. J Psychopharmacol 20: 553–561.

Susman, I. G. (1983). Action research: A sociotechnical system perspective. ed. G Morgan. London: Sage Publications.1983. p 102.

Titchen A., Binnie A. (1993). What am I meant to be doing ? putting practice into theory and back again in new nursing roles. J Adv Nurs 18:1054-1065.

Whyte W.F. (1991). Participatory action research. NY; Sage NY.

Zaidenstein, R., Eyal S., Efrati S., Akivison L., Michowitz M.K., Nagornov V., & Golik A. (2002). Adverse drug events in hospitalized patients treated with cardiovascular medications and anticoagulants. Pharmacoepidemiol Drug Saf 11:235-238.

Zuber-skerritt O. (1996). New directions in action research. London: Falmer Press.