Thinking aloud in dispensing drugs

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Thinking Aloud while Dispensing Drugs Medical management consists of many steps, and errors at any point along the way can lead to detrimental effects to the patient. One of these errors could be in dispensing drugs. In a prospective study done in community pharmacies, it was found that for every 10, 000 items dispensed, an average of 22 near misses and 4 dispensing errors occurred (Aschroft, Quinlan, and Blenkinsopp, 2005). Due to the large volume of drugs dispensed by pharmacies, this could easily translate into a large number of errors. Dispensing errors were most commonly attributed to being busy, being short-staffed, time constraints, fatigue, interruptions, and look-alike or sound-alike medicines (Beso, Franklin, and Barber, 2005), all of which can be experienced by most pharmacists. In this pilot study, the aim is to detect dispensing errors and eventually reduce them by using a think aloud technique. The think aloud technique is one of the strategies in human factors engineering, which is a framework for efficient and constructive thinking that are developed for healthcare teams to perform patient safety at all times (Gosbee, 2002). It has been used in clinical decision-making, and has been found to have favorable effects especially during situations wherein there are rapid and overlapping decision making processes (Lundgren-Laine, 2010). Hypotheses This study aims to find out whether using a think aloud technique will help in detecting dispensing errors. It is hypothesized that participants using a think aloud technique while dispensing drugs in the pharmacy practice lab will be able to detect their dispensing errors significantly more than participants who are silent while they carry out their dispensing activities. The null hypothesis states that there will be no significant differences in the amount of dispensing errors detected by those using the think aloud technique and

those who are silent. Variables In this study, the independent variable to be studied is the use of think aloud technique. The experimental condition is thinking aloud while dispensing drugs, while the control condition is keeping silent while dispensing drugs. The dependent variables to be measured are the time it takes to dispense the drugs, the number of actions the participant makes, and the number of mistakes detected. All of these variables can be measured using an interval scale. A possible confounding variable is in difficulty in reading the prescription or drug information. These can be addressed by making sure labels are legible and the drug used is one where all participants have equal familiarity with. A possible extraneous variable is varying levels of fatigue in the participants. This can be addressed by subjecting the participant to both conditions. Selection of Participants The population selected for this study comprise of the users of the pharmacy practice lab. If the users amount to 200 individuals and the confidence level is set at 99% due to the sensitive nature of medication errors, the sample size needed is 90. Participants will be selected by simple random sampling. For this pilot study, however, the researchers will only be selecting six participants. Allocation of participants The design chosen for this study is within participants. Participants would be subjected both to the experimental condition (using think aloud technique) and the control condition (keeping silent). This is to eliminate possible confounding variables, such as level of familiarity with drugs, fatigue of participants, and vigilance. The participants, however, will be divided into two groups by randomization. The first group will undergo the experimental condition first, then the control condition after a number of days have passed. The second group will undergo the control condition first, then the experimental condition after same number of days

have passed. This is to minimize carryover effects. Data analysis A within participants study with dependent variables that can be measured using an interval scale can be statistically analyzed using a multiple analysis of variance. This statistical test will show whether there are statistically significant differences in the performance of participants in the two conditions as measured by time interval, number of actions, and number of mistakes. Materials or Equipment The following materials are needed: prescriptions to fill out, drugs to choose from, and a video camera that the pharmacists will use to film themselves while dispensing drugs. The prescriptions would contain the following data: name of drug, formulation, and administration schedule. The dependent variables will be measured with a stopwatch (for the time interval), and by tallying the number of movements and number of errors detected using a pen and paper. The counters are ideally blinded to the experimental design. Bias Using a within-participants design can effectively eliminate participant factors such as fatigue, intelligence, or skills, as the group of participants are the same for both conditions. However, a possible bias is the occurrence of carryover effects, wherein the participants may learn from the first condition and carryover the new knowledge or skill to the second condition. This may result in better outcomes for the second condition. Another carryover effect is fatigue, wherein the participants may not perform well in the second condition due to fatigue from the first condition. This can be addressed by having a sufficient time interval between performing the two conditions and by randomizing which condition should be done first. In effect, half of the participants will first dispense drugs using the think aloud technique, then after a few days, dispense drugs while being silent. The other half would first

dispense drugs while being silent, wait a few days, and then dispense drugs using the think aloud technique. To assure that there are no statistically significant differences between these two groups, a statistical test should be performed and show that there are no significant differences. Informed Consent All participants would be briefed about the nature of the study and asked to sign an informed consent. Questions and clarifications will be addressed. Safety and Ethical Issues Participants will not be exposed to physical harm in this experiment. To ensure that no emotional damage is done, they will be debriefed after the experiment. The researchers will explain the nature of errors in dispensing drugs and why steps are being taken to optimize the working conditions. References Aschcroft, D. M., Quinlan, P., and Blenkinsoop, A. (2005). Prospective study of the incidence, nature, and causes of dispensing errors in community pharmacies. Pharmacoepidemiology and Drug Safety, 14(5), 327-332. Beso, A., Franklin, B. D., and Barber, N. (2005). The frequency and potential causes of dispensing errors in a hospital pharmacy. Pharm World Sci, 27, 182-190. Gosbee, J. (2002). Human factors engineering and patient safety. Quality and Safety Health Care, 11, 352-354. Lundgren-Laine, H. (2010). Think-aloud technique and protocol analysis in clinical decision-making research. Qualitative Health Research, 20(4), 565-575.