The Process of Adapting SafeMedicate© (Medication Dosage Calculation Skills Software) for Use in Brazil

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Failures in the medication-use processes significantly contribute to the reduction of patient safety. A Drug Information Centre in Brazil reports that most errors are related to prescribing, preparing, and administering medications (Dos Santos, Winkler, Dos Santos, & Martinbianchi, 2015). A study comparing the educational practices and perspectives related to the medication dosage calculation skills of providers reports that most academic educators in nursing, clinical educators in nursing and clinical nurses agree that dosage calculation skills are important for safe medication administration (Crawford, 2016). Students using safeMedicate achieve significant improvements in the construction of conceptual and calculation competence in medication dosage calculation problem-solving (MDC-PS) in both UK and USA programmes. The safeMedicate experimental research highlights how authentic environments are more able to support all cognitive learning styles in mathematics (Weeks, Clochesy, Hutton, & Moseley, 2013) than traditional didactic methods of education. The dissertation aims to adapt and evaluate Authentic World Medication Dosage Calculation software for use in Brazil. The dissertation will be carried out in two phases: (1) adaptation and (2) preliminary evaluation. It uses a formative research approach which is a kind of developmental research or action research which improves instructional-design theory (model), practices, and processes, guided by the adapted model of the Participatory and Iterative Process Framework for Language Adaptation (PIPFLA) (Maríñez-Lora et al., 2016). It consists of an 11-step process which follows and assures the theoretical base used for safeMedicate development as well as the theoretical base guidelines for the language adaptation process. The safeMedicate program methodology is rooted in Piagetian psychology as it is useful to look closely at the ways in which the individual builds particular mathematical ideas or concepts (Kolb, 2014). SafeMedicate experimental research highlights how authentic environments are more able to support all cognitive learning styles in mathematics (Weeks, Clochesy, Hutton, & Moseley, 2013) than traditional didactic methods of education by offering opportunities to tailor and expand mathematical skills through mental computation, arithmetic, geometry/visual, and algebra (Weeks et al., 2013). Language adaptation generally includes more than a simple word-for-word translation. It is an interpretation of meaning. This moves translation beyond grammatical rules and writing conventions to an interpretation informed by socio-cultural and contextual factors. In order to inform and guide the language adaptation process, it is required to use a combined emic (within-culture/insider’s perspective) and etic (similarities across cultures/outsider’s perspective) (Maríñez-Lora, Boustani, del Busto, & Leone, 2016). Translation and back translation have been common steps in adaptation processes. However, the back translation benefit of providing information about semantic and conceptual equivalence has been questioned in the translation science. Moreover, the International Medical Interpreters Association does not recommend back-translation. The argument is that comparison of an original source text and a back-translated source provide only limited and potentially misleading insight into the quality of the target language text. This happens because many adaptations made by the translator which perfectly convey the meaning of the original are lost in the back translation giving the appearance of an inaccurate rendition (Harkness, 2013). It is recommended that instead of looking at two source language texts, it is much better in practical and theoretical terms to focus attention on first producing the best possible translation and then directly evaluate the translation produced in the target language, rather than indirectly through back translation (Harkness, 2013). Although studies incorporate systematic approaches of language adaptation process in various degrees, the source is not often cited (Maríñez-Lora et al., 2016). As such, a strength of this process is the transparent nature in which safeMedicate will be adapted. In order to strength methodology, the adaptation results will be based on the triangulation of three methods (focus groups, interview, and face validity surveys) and considers the evaluation methods used to prepare language adaptations which are Informativeness, Source Language Discrepancy, Security, and Practicality (Maríñez-Lora et al., 2016). In addition, it will be...
used journaling. Journaling helps to gain a more in-depth perspective beyond the initial understanding of the research question. By identifying and documenting motivations, interests, and perspectives initially and throughout the research process, the principal investigator consciously compare the final interpretation with what first expected to find, building trustworthiness of the data. The focus groups are a language adaptation team and panel of experts whose group meetings will occur through synchronous communications (skype conference calls) according to members’ availability, which will be recorded. A poll will be made to discover when most are available. After the meeting, data will be synthetized and a cross-checking of recommendations will be performed. The language adaptation team will merge two translations from the source language version to target language (English-Portuguese). Afterwards, the panel of experts will provide feedback of adaptations necessary, following a cycle of re-adaptations until the panel reaches consensus. Later, a face validity survey will be presented to the target group (nursing students and professionals seeking an update) as an opportunity to reflect and evaluate implementation of the instructional-design as a whole. The recruitment strategy will occur through snowballing sampling method. The partners for safeMedicate adaptation will be selected according to their role in the process. For the language adaptation team, the inclusion criteria is the fluency in English and Portuguese. For the panel of experts, it will be included only nursing professionals that have been in the job market for four years performing as professors, supervisor of nursing students and/or clinical nurse. The student panel will be draw from a list of the names indicated by the panel of experts: each expert will indicate three students and one professional nurse. The 18 students and 6 nurses will be invited to the student panel. The three first students and one professional nurse who commits to participate will be allowed access to the safeMedicate Brazilian version. To explore the evaluation of safeMedicate and identify the adaptations necessary in the software for use in Brazil, transcripts from the group conference calls will be subjected to content analysis. The primary investigator and a second coder will first independently code the transcript of the first conference call. The second coder is a doctoral nursing professor trained in qualitative research. Both will identify and sort the statements referred to the research question (which are the adaptations necessary in safeMedicate for use in Brazil?). Further corroboration of the themes and domains will be done using ATLAS/6 ti software. Inter-rater reliability will be calculated through ATLAS/6 ti software. Descriptive statistics will be used to analyze and report the face validity survey data, calculating frequencies, measures of central tendency, and standard deviations. The results provide evidence to support future language adaptations. The transparent nature in which safeMedicate will be adapted allows future researchers to follow a detailed systematic language adaptation process, using the strength of qualitative and quantitative approaches.

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References:


**Abstract Summary:**
This dissertation is a context and language adaptation of an evidence-based intervention called safeMedicate, a program that reinforces learning synthesis in crucial elements of medication dosage problem solving and provides foundation for development in remaining levels of the hierarchy of learning.

**Content Outline:**

1. Introduction:
   1. Failure in the medication-use process in Brazil
   2. safeMedicate impact

2. Body
   1. Adaptation process theoretical bases: safeMedicate and language adaptation theoretical bases.
   2. Adaptation methodology: methods and recruitment strategy.
   3. Data analysis: Qualitative and quantitative analysis.

3. Conclusion

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