

POSTER PRESENTATION 3: PHYSICAL AND MENTAL HEALTH

Developing decision support algorithms for use in a digital therapeutic system

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Purpose There are multifaceted factors that contribute to medication nonadherence among older adults that result in missed medication doses (Yap et al., 2016). Medication Education, Decision Support, Reminding, and Monitoring (MEDSR^eM[®]) is a digital therapeutic system (smartphone app and companion website) for improving adherence to hypertension medications and self-management of blood pressure among older adults. A key feature of MEDSR^eM[®] is Decision Support that guides the older user to take or skip a dose after their “time to take” has passed. The ‘safe window’ is a duration of time in hours when older adults can safely take their medication. Thus, the purpose of developing the safe windows within the MEDSR^eM[®] Decision Support Algorithms was to guide decision-making for older adults when they have missed the usual dosing hour and are trying to determine whether it is still safe to take the missed dose since there is an upcoming scheduled dose. **Method** A comprehensive medication formulary that includes all hypertension medications, combination agents, and doses safe for use by older adults in the United States was created for MEDSR^eM[®], with which the Decision Support Algorithms were generated. Medications that are potentially inappropriate for older adults and included in the 2019 Beers Criteria[®] were excluded from the MEDSR^eM[®] formulary (The 2019 American Geriatrics Society Beers Criteria[®] Update Expert Panel 2019). The algorithms for coding the ‘safe window’ recommendations into the MEDSR^eM[®] app were developed based on: a) a literature review of studies that evaluated missed doses of hypertension medications and b) the pharmacology of aging, including pharmacokinetic and pharmacodynamic principles, given physiological changes with aging that affect the metabolism and excretion of hypertension medications. The safe windows within the algorithms were then checked: c) against commercially published medication information for consumer use, when available, d) against drug information resources for providers, and e) by peer review performed by experts in pharmacokinetics, pharmacology, clinical pharmacy, geriatric pharmacy, and geriatric medicine. An interdisciplinary collaboration among pharmacy, nursing, cognitive aging, and technology experts was crucial for designing and implementing MEDSR^eM[®] Decision Support for older users. **Results and Discussion** A total of 93 hypertension medications and combination agents were included in the MEDSR^eM[®] formulary including available formulations (ranged 1-10) and dose options (range 1-11). The literature search yielded 32 articles of safety trials, pharmacokinetic studies, and clinical trials with intentional missed dose at the end of the trial that were reviewed in generating the MEDSR^eM[®] Decision Support Algorithms. Through interdisciplinary collaborations, we developed and implemented the decision support algorithms to the MEDSR^eM[®] app. The built-in coding of the algorithms in the MEDSR^eM[®] app for the specific medication(s) supports older users to make the decision of taking or skipping the missed hypertension medication dose. In addition, hypertension medication education and information about missed medication management aim to increase older user’s knowledge about the importance of medication adherence to improve their blood pressure and health outcomes.

References

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