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THE EFFECTS OF A SERIOUS GAME ON KNOWLEDGE OF CKD, HYPERPHOSPHATEMIA, AND PHOSPHATE BINDERS IN CKD PATIENTS STAGE 4/5: A PROSPECTIVE MULTINATIONAL STUDY

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Abstract:

INTRODUCTION AND AIMS: Understanding of hyperphosphatemia and the role of phosphorus is widely recognized as being poor among patients with Chronic Kidney Disease (CKD). While educational games (video or mobile games for training and education) have been shown to improve knowledge among young patients with chronic illness, there is scant evidence for their effectiveness with older patients. This survey aimed to examine the effects of a mobile game-based intervention, “Phosphorus Mission,” on knowledge of phosphorus, hyperphosphatemia and CKD in general among CKD patients. Credibility and acceptability of the game were also assessed.

METHODS: In a prospective study using interviews and self-report survey methods, we analysed credibility and acceptability as well as the association between the use of the serious game and patient knowledge. Analyses were conducted using t-tests.

RESULTS: N=72 Stage 4/5 CKD patients currently on phosphate binders, and owning an iOS or Android device, were recruited from clinics in Malaysia, Singapore, Korea and the Philippines. Face-to-face structured interviews took place at baseline and 8 weeks with 2 waves of interim assessments occurring every 2 - 3 weeks. Over the course of the study, patients reported consistent increases in knowledge of CKD, phosphorus and hyperphosphatemia (23%, 35% and 60% increases respectively, all $p < .05$). The proportion of patients who knew that excess/high levels of phosphorus can cause heart disease doubled from baseline (22%) to final follow-up (45%). The proportion aware that phosphate binders can help control phosphorus levels also doubled (26% to 48%) (all $p < .05$). Subgroup analysis revealed that the pattern of increases in knowledge were consistent across countries. On a Likert scale from 1 to 7 (1=not informative at all, 7 = very informative), patients rated the game as highly informative about CKD ($m=6.2$ [$SD=1.4$]) and phosphorus levels ($m=6.4$, [$SD=1.1$]). They also gave positive ratings for their overall experience with the serious game ($m=6.2$ [$SD=1.3$]).

CONCLUSIONS: Use of the “Phosphorus Mission” was associated with consistent improvements in knowledge in the targeted domains of the intervention. The serious game shows promise as an acceptable and credible digital education tool for patients with CKD. Future studies may be conducted in randomized clinical trial conditions with a control group to further clarify causality. This research was sponsored by Sanofi.

REFERENCE:

- Kato, P. M. & Hill, P. (2015). The Effects of a Serious Game on Knowledge of CKD, Hyperphosphatemia, and Phosphate Binders in CKD Patients Stage 4/5: A Prospective Multinational Study. *Nephrology Dialysis Transplant*, 30 (suppl 3): iii512 doi:10.1093/ndt/gfv193.12.