WHAT SUBJECT, COGNITIVE OR BEHAVIORAL COMPONENTS INFLUENCE FALLS AND FALL PREVENTION? : A STRUCTURAL EQUATION MODEL

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Purpose: Participation in a Multimedia Fall Prevention (MFP) program significantly reduces falls. MFP increases recognition of fall threats and fall prevention behaviors, both thought to contribute to reducing falls. However, little is known about how cognitive, behavioral and Subject characteristics influence intervention success or the likelihood of a fall. We evaluated the deterministic relationships between fall threat recognition (FTR), prevention behaviors (PB) and falls using Structural Equation Modeling (SEM).

Methods: Outcome measures from a clinical trial including 273 Seniors with a history of falls (32% male, 60-96 years, mean age =79, SD =7) were entered into a structural equation model after examination of descriptive statistics and bivariate correlations. A 4-component model was created where uncorrelated Subject variables: Gender, Age, Impairment and Experimental Condition (Multimedia or Usual Fall Prevention) were most distal to falls. Subject variables were presumed to predict 3 progressively more distal outcome measures: 1-FTR, 2-PB; and 3-two parallel but uncorrelated final outcomes: a) Time to 2nd Fall, b) Average Falls per week. Non-significant effects were removed from the model. Partial correlation values (r) are presented for significant effects.

Results: In Step 1, Gender (r=.13), MFP (r=.10) and Age (r=-.01) all influence Fall Threat Recognition. Prevention Behaviors are influenced in Step 2 by MFP (r=.20) and FTR (r=.02). Finally, for falls outcomes: a) Time to 2nd Fall is influenced distally by Impairment (r=.83) and proximally by PB (r=.55); while b) Falls per Week is affected by both Impairment (r=.57) and FTR (r=.02). Significant distal outcomes demonstrate that these relationships remain, even when proximal effects are considered.

Conclusion: The MFP program significantly affects cognitive (Fall Threat Recognition) and behavioral (Prevention Behaviors) processes. Gender and Age influence cognitive processes, which in turn influence behavior. The final direct relationships between Fall Threat Recognition or Prevention Behaviors and falls are difficult to interpret with the previous influence of Gender, Age and MFP removed. The relationship between knowing what can cause a fall, prevention efforts and actual falls is not linear. Intervention studies must account for the effects of time and intervening variables.