

Validation of a New Tool to Assess Knowledge about Warfarin (Coumadin) in a Population with Limited Literacy: the Knowledge Information Profile – Coumadin (KIP-C)

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BACKGROUND

- Oral Anticoagulation Therapy (usually with Coumadin) requires active patient self-care to maintain balance between bleeding and clotting
- Not following dosing and improper monitoring decrease potential therapeutic benefits while increasing risk of adverse effects
- Majority who take Coumadin are older adults taking it for prevention and/or treatment of thromboembolic complications
- Low-literacy presents an additional challenge to patients taking Coumadin who must use basic comprehension and numeracy skills to manage anticoagulation therapy safely
- There is no validated tool to measure knowledge about Coumadin use

PURPOSE AND HYPOTHESIS

- The first purpose of this study was to determine the psychometric properties of the KIP-C, a new instrument that measures knowledge about Coumadin
 - We hypothesized that knowledge scores would correlate between baseline and follow-up (test-retest reliability) and would correlate with length of time taking Coumadin (construct validity)
 - Exploratory and confirmatory factor analyses would produce a model with good fit and clear factor loadings
- The second purpose was to examine the literacy level of patients and how it relates to knowledge about Coumadin
 - We hypothesized that greater knowledge would be associated with greater literacy

TARGET POPULATION

- Attendees of an outpatient, pharmacist-directed Coumadin Clinic, affiliated with an urban teaching hospital, that manages over 800 registered patients

MATERIALS AND METHODS

RECRUITING

- Convenience sample was recruited from Clinic patients in the summer of 2009
- Research team members recruited at the Clinic 4 times per week until enrollment target met
- Inclusion criteria were age 18+, read and spoke English, cognitively able to participate

DATA COLLECTION

- Informed consent was obtained by the research nurse prior to data collection
- Completed Rapid Estimate Adult Literacy in Medicine (REALM) as an assessment of reading ability/literacy at baseline
- Demographic Profile completed at baseline
- Knowledge Information Profile – Coumadin (KIP-C) completed at baseline
 - Repeated again 2 weeks later

RESULTS

DEMOGRAPHICS

- 192 participants were recruited
- 82% African American
- 56% female
- Mean length of time taking Coumadin was 4.8 (sd 6.2) years
 - ranged from less than 1 to 37 years

Education

- 40% high school graduates
- 21% completed less than high school
- 38% completed at least some college

Literacy

- Average REALM score was 52.9 (sd 17.9, range 0 to 66)
 - Equivalent to 7th or 8th grade reading ability

PSYCHOMETRICS

- KIP-C scores at baseline and follow-up were correlated with each other ($r = .68, p < .0001$)
 - Suggests adequate test-retest reliability
- At baseline, the KIP-C was correlated with the REALM at $.23 (p = .002)$ and with length of time taking Coumadin at $.20 (p = .005)$
- At follow-up the correlations were $.28 (p < .0001)$ with the REALM and $.18 (p = .01)$ with time on Coumadin
 - Supports construct validity

FACTOR ANALYSIS

- A 3-factor solution was discovered, with subscales representing 1) Vitamin K (foods and knowledge), 2) Side Effects of Coumadin, and 3) Other foods, beverages, and medications related to Coumadin
- Model had a good fit
 - $\chi^2 = 90.93, df = 74, p = .09$
 - comparative fit index = .94
 - root mean square error of approximation = .035
 - all factor loadings were significant ($p < .05$) using the critical ratio/Wald test

Final KIP-C with 14 items (also showing the 6 deleted items)

- ~~k1 The name of my medicine from this clinic is called Coumadin~~
- k2 This medicine will cause my blot to clot
- k3 I can take over-the-counter medicines like aspirin while I am taking Coumadin
- ~~k4 This medicine is also called a "blood thinner"~~
- ~~k5 Foods like collards, turnip, mustard, lettuce, and broccoli are high in Vitamin K~~
- k6 Coumadin is an anticoagulation medication
- k7 If I want to go on a diet, now would be a good time while I am taking Coumadin
- ~~k8 I should eat the same amount of leafy green vegetables like collard greens, turnip greens, and broccoli each week while taking Coumadin~~
- k9 I can take any amount of laxatives and aspirin while taking Coumadin
- k10 Lots of Vitamin K is good for me while taking Coumadin
- ~~k11 I should report any feelings of chills, fevers, or sore throat to the doctor~~
- k12 Vitamin K helps Coumadin prevent blood clots
- k13 It is not safe to drink liquor while on this medicine, but I can have as much beer or wine as I want
- k14 Foods like fish, mineral water, and tomatoes are high in Vitamin K
- ~~k15 I can eat any amount of collard greens as I want while taking Coumadin~~
- k16 Indigestion is a side-effect of Coumadin
- k17 Bleeding from the gum after brushing my teeth is a side-effect of Coumadin
- k18 Swelling of the hands and feet is a side-effect of Coumadin
- ~~k19 Blue or purplish coloration of the skin feet is a side-effect of Coumadin~~
- k20 I can take any kind of vitamins I want while I am on Coumadin

CONCLUSIONS

- The KIP-C offers an easy-to-read assessment of patient's Coumadin knowledge.
- The final KIP-C has 14 items in a true/false format
 - Takes < 10 minutes to complete
- Patients with lower literacy and less time taking Coumadin scored lower on the KIP-C
 - Providing additional education to these patients can improve knowledge about Coumadin, likely resulting in better anticoagulation management and fewer complications

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