# Perceived Behavioral Control as a Key to Integrative Medicine

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## Abstract

The purpose of the present study was to identify the factors that are the strongest predictors of intentions and use of integrative medicine approaches in clinical practice. Ajzen's theory of planned behavior was used to guide our examination of these questions. Health care professionals exposed to a Veterans Health Administration program (N = 288) who completed survey instruments prior to and immediately after the program and 3 months later were the participants for this study. Findings suggest that the theory of planned behavior performs reasonably well in explaining our data showing the integration of integrative medicine approaches into clinical practice. We found that self-efficacy to use integrative health approaches and perceived preparedness to discuss nonpharmaceutical approaches with patients were the strongest predictors of intentions to use integrative health approaches and self-reported change in clinical practice. The implications of these findings are discussed.

The Veterans Health Administration (VHA) has transformed its approach to health care to one that is personalized, proactive, and patient-centered with the goal of helping Veterans achieve their greatest possible health and well-being.[1] As a part of this transformation, the VHA has developed experiential courses available to VHA clinical staff that promote awareness and integration of patient-centered care (PCC) and integrative medicine (IM) approaches into clinical encounters. The goal for these encounters is placing the veterans' needs and wants and their social, emotional, spiritual, and physical well-being at the center of care.[2]

The Institute of Medicine defines PCC as "care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions."[3(p3)] A PCC approach redefines the provider role from one of "authority" to one of "partnership, solidarity, empathy and collaboration."[4(p101)] PCC approaches place the patient at the center of the clinical encounter using open-ended questions, pauses, reflective listening, eye contact and body language.[5] PCC approaches have been found to improve patient satisfaction,[6-9] as well as treatment adherence and chronic disease management.[6-14]

IM is described as a set of behaviors that reaffirm "the importance of the relationship between practitioner and patient, focuses on the whole person, is informed by evidence, and makes use of all appropriate therapeutic and lifestyle approaches, healthcare professionals and disciplines to achieve optimal health and healing."[15] IM brings together conventional and complementary health approaches to promote health and well-being that aligns with the patient's values, motivations and the available evidence.[16] IM approaches are included in medical,[3] pharmacy,[17] and nursing[18] school curricula and offered as professional development opportunities for clinicians.[2] Some studies find enhanced competencies, acceptance[19,20] and self-reported use during clinical encounters[2] as

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a result of exposure to such courses. It is less clear what attitudinal and perceptual measures that these courses seek to shift are most strongly associated with skill integration.

The VHA developed a 2.5-day experiential course (recently expanded to 3 days) entitled "Whole Health in Your Practice" to aid in the transformation of clinical care for veterans. Whole Health is defined by the VHA as an approach to health care that empowers and equips people to take charge of their health and well-being and to live their lives to the fullest. Whole Health incorporates fundamental aspects of IM to provide care that is personalized, proactive and patient-centered and that draws on mindful awareness, empowerment through self-care and the power of community. The course seeks to help clinicians (1) develop personalized, patient-centered health plans providing veterans with the opportunity to reflect on their health and aspirations; (2) find opportunities for innate healing through nutrition, stress management, movement, mindful awareness, and other self-care practices; and (3) increase awareness of evidence-based nonpharmaceutical approaches to care. The course provides opportunities for clinicians to experience these approaches for themselves, shifting attitudes, self-efficacy, and intentions to use these approaches with patients. A summary of the curriculum components appears in the appendix. The Academic Consortium for Integrative Medicine and Health suggests the use of experiential approaches to facilitate firsthand experience with IM approaches and to promote self-care and reflection.[21]

Using an intervention only design (described elsewhere[2]), an evaluation of this effort in 15 VHA facilities found increases at immediate post and 3-month follow-up for self-efficacy to engage in Whole Health practices, preparedness to discuss nonpharmaceutical approaches to care, attitudes in support of IM and complementary health approaches, and intentions to engage in Whole Health practices during clinical encounters. The evaluation also found an increase in self-reported use of Whole Health strategies and practices during clinical encounters at 3-month follow-up.[2]

What remains less understood is which attitudinal measures changed by the course have the greatest impact on intentions to engage in Whole Health practices and integration of these behaviors into clinical practice. Identifying the measures that have the strongest associations with intentions and behavior change can guide the development of curricula, trainings, and dissemination efforts that seek to integrate IM approaches into clinical practice.

The theory of planned behavior (TPB)[22] can be used as a framework for examining these questions. The TPB theorizes about the causal pathway between attitudes, subjective norms, behavioral control, intentions, and behaviors. Ajzen's TBP[22] proposes that attitudes toward engaging in behavior, subjective normative influences surrounding the behavior, and perceived behavioral control (eg, beliefs about whether one *can* perform the behavior) or self-efficacy[23] influence intentions or motivation to engage in the behavior, which in turn influence actual behavior. The TPB is an extension of the theory of reasoned action that includes perceived behavioral control.[22] Including perceived behavioral control is thought to provide key

information on perceived constraints to action.[24] This seems especially relevant in busy health care settings, where environmental constraints and self-efficacy to use IM practices, that tend to fall outside of one's traditional clinical training, may inhibit behavior change. The TPB has been found in numerous past meta analytic studies to predict change in a range of health seeking behaviors with perceived behavioral control being among the strongest predictors of intention and behaviors.[24-26] Few studies have applied the TPB to the integration of IM approaches in clinical practice with most using cross-sectional study designs.[27,28] This study advances our understanding of the role of TPB as a tool for predicting IM skill integration using a prospective study design.

We examined whether TPB predicts intention and use of Whole Health strategies during clinical encounters among health care providers who participated in a 2.5-day Whole Health in Your Practice Clinical Course. Participants completed baseline, immediate post, and 3-month follow-up self-report surveys. Survey constructs included (1) attitudes toward engaging in Whole Health practices; (2) subjective norms, defined here as perceived institutional support for PCC (examined separately); (3) perceived behavioral control, defined here as self-efficacy to engage in Whole Health practices and the ability to discuss nonpharmaceutical approaches to address chronic disease conditions during clinical encounters; and (4) intention and integration of WH strategies into clinical practice. Intentions and behaviors represent intending to and engaging in Whole Health strategies that are discussed and modeled in the course. Measures of attitudes, perceived norms, perceived behavioral control over Whole Health practice, and intentions to engage in Whole Health practice were measured at baseline, immediately following, and 3 months after the course and engaging in Whole Health practice was measured at baseline and 3 months after the intervention.

We examined whether the TPB served as reasonable model for explaining Whole Health practice by examining whether (1) attitudes, (2) subjective norms (about institutional support), and (3) perceived behavioral control (ie, self-efficacy and ability to discuss nonpharmaceutical approaches) were related to intentions to integrate Whole Health strategies into clinical practice and whether intentions to integrate Whole Health strategies into clinical practice were related to integrating Whole Health strategies into clinical practice. All measures were assessed immediately following the course, except for behavior, which was assessed three months after course completion. Structural equation modeling was used to examine these relationships, as (1) we can explore the extent to which predicted relationships are consistent with the observed relationships and (2) we can model measurement error and factor structure when using new measures of these constructs.

## Methods

### Participants

The sample for this study was 420 baseline participants across 10 Veterans Affairs sites, where 381 (or 91%) participated at immediate

posttest and 288 participated at follow-up (or 69% of 420). The study protocols were deemed exempt from human subjects review by the Pacific Institute for Research and Evaluation Institutional Review Board. These 288 participants serve as the focal sample for this article. The participants were in their late forties on average (M = 47.77 years, SD = 10.59) and more than three-quarters of the participants were female (78%). Considering the racial makeup of the sample, 7 of 10 in the sample were White (70%) with Blacks (11%), Asians (10%), Hawaiian or Pacific Islanders (2%), and American Indians (1%) having smaller representations in the sample. Also, a very small proportion of the sample reported a Hispanic ethnicity (6%). Considering the occupations held by participants, the most frequent occurring occupations were nurses (37%), medical doctors (18%), and social workers (13%). The balance of participants were nurse practitioners (7%), psychologists (6%), respiratory/occupational/physical/kineseo-therapists (4%), administrative workers (4%), dietitians (4%), clinical pharmacists (2%), medical support assistants (2%), chaplains (1%), PCC coordinators (1%), or other unclassified healthcare workers (3%). Examining other occupational characteristics, participants worked for the Department of Veterans Affairs slightly more than 10 years on average (M = 10.17 years, SD = 8.94) and close to one-fifth (17%) were veterans. The training was mandatory for slightly more than one-quarter of participants (28%). The sample reported in this analysis is described more fully by Atwood and her colleagues.[2]

## Measures

The survey measures used in this study included measures of Whole Health–related attitudes (8 items adapted from Hsiao et al[29] measuring attitudes toward complementary and alternative medicine (CAM) practices; for example, "I understand the strengths and weaknesses of both convention and complementary medicine"); subjective norms about engaging in Whole Health practices (4 items measuring institutional support for PCC; eg, "Overall, the VHA staff is supportive of efforts to transform this facility to a patient-centered care model"); and perceived behavioral control over engaging in Whole Health practices (5 items measuring self-efficacy to engage in Whole Health practices; eg, "I feel confident in my ability to change the context of my interactions with patients from one that focuses on disease to one that focuses on health," and 4 items measuring preparedness to discuss nonpharmaceutical approaches to care for 4 chronic conditions; eg, "How would you rate your preparedness to discuss with veterans nonpharmaceutical approaches for treating: pain"). Intentions and integration of Whole Health strategies into behavior during clinical encounters were each measured with 7 items (eg, "Ask veterans what really matters in their lives so decisions are patient driven"). All items used Likert-type response scales, where response options were coded 1 to 4, except preparedness, which used was coded 1 to 5. These measures are discussed in more detail elsewhere.[2] Most measures were administered at all 3 waves, except behavior, which was not measured at immediate posttest. Our analysis only examined posttest measures, except for behavior, where we used our 3-month follow-up measure. The measurement point immediately following the course (ie, posttest) likely best reflects the antecedents of and intentions for behavior and actual behavior 3 months after the course could only be measured 3 months after the course. The psychometric properties of these scales are presented in the Results section.

## Procedure

Two weeks prior to the start of the 2.5-day course, participants were sent an email with a link to a web-based pretest survey. Those who did not complete the web-based pretest survey were asked to complete a paper survey onsite prior to the start of the course. Participants completed paper posttest surveys onsite on the final day of the course. Two months after completion of the course, participants were sent a link via email to a web-based follow-up survey. Nonrespondents were sent up to 4 email reminders asking them to complete the survey. As mentioned previously, the sample for this analysis represent 288 participants who responded to the 3-month follow-up survey.

## Analysis and Analytic Considerations

Structural equation modeling was used to examine (1) whether the TPB serves as a suitable explanation for the relationships we observe in our data and (2) which factors that are presumed to be influenced by training (Whole Health–related attitudes, subjective norms, and perceived behavioral control) have the biggest impact on increasing intentions to engage in Whole Health–related behaviors. As sometimes predicted by the TPB, the direct impact of perceived behavioral control on behavior was also examined. All models were fit using the latent variable analysis (lavaan) package[30] in the R environment for statistical computing.[31] Full information maximum likelihood was employed to use all cases, even if they contained missing data.

Selectivity serves as one potential bias in this analysis, as it may restrict the range of variables directly targeted by the course (ie, Whole Health–related attitudes, subjective norms, and perceived behavioral control—our exogenous study variables). More specifically, those who both finish the course and participate in the follow-up survey may be those who have a more positive evaluation of Whole Health practices. We explored this possibility by regressing study attrition status at follow-up on baseline standing for all exogenous study variables, as well as a measure of positive attitudes toward PCC at baseline and whether the training was mandatory. The overall logistic regression model was not significant, $\chi^2(6) = 9.68$, $P = .139$. The only coefficient that was significant suggested that those who dropped out of the study by follow-up had less positive attitudes toward PCC, $\chi^2(1) = 4.01$, $P = .045$. Thus, this potential bias seems to be minimal.

Another potential bias is that study participants are nested within 10 Veterans Affairs facilities, so relationships observed could be a function of variability among facilities, as opposed to attitudes, norms, and perceived behavioral control influencing intentions and behavior. We explored this possibility by performing null random intercept regression models for our endogenous outcome variables (ie, intentions and behavior), examining site as the unit of analysis. Using the intraclass correlation coefficient (or $\rho$) as a measure of variability among sites There was no evidence of significant ($P < .10$) site-level variability for intentions ($\rho < .001$) or behavior ($\rho = .012$). Moreover, 10 sites are usually too few to adequately estimate variability among sites.[32] As such, the structural equation models reported did not adjust effects for variability among sites.

## Results

Measurement models were first fit and latent variables were arbitrarily scaled to the first item of the scale. The first model did not specify correlated measurement errors between scale items. The second model allowed errors to correlate between

**Table 1.** Factor Loadings for Latent Variables.[a]

| | Estimate | Standardized | z |
|---|---|---|---|
| **Self-efficacy (0 = *Strongly disagree*, 1 = *Disagree*, 2 = *Agree*, 3 = *Strongly agree*)** | | | |
| I feel confident in my ability to change the context of my interactions with patients from one that focuses on disease to one that focuses on health. | 1.00 | .31 | — |
| I feel confident in my ability to encourage the use of self-care strategies with veterans (eg, mindful awareness, mind-body strategies, nutrition). | 1.14 | .36 | 8.72 |
| I feel confident in my ability to use integrative health strategies in my clinical encounters with veterans (including referring patients to or using complementary modalities). | 1.28 | .40 | 8.83 |
| I feel confident in my ability to help patients use their resilience to achieve their own health goals. | 1.17 | .37 | 9.68 |
| I feel confident in my ability to integrate mindful awareness in my clinical interactions. | 1.24 | .39 | 9.29 |
| **Institutional support for patient-centered care (0 = *Strongly disagree*, 1 = *Disagree*, 2 = *Agree*, 3 = *Strongly agree*)** | | | |
| There are existing efforts in place to transform this Veterans Health Administration (VHA) facility to a patient-centered care model. | 1.00 | .44 | |
| Overall, the VHA staff is supportive of efforts to transform this facility to a patient-centered care model. | 0.86 | .38 | 8.81 |
| Overall, the VHA leadership is supportive of efforts to transform this facility to a patient-centered care model. | 1.10 | .49 | 9.06 |
| **Complementary and alternative medicine attitudes (0 = *Strongly disagree*, 1 = *Disagree*, 2 = *Agree*, 3 = *Strongly agree*)** | | | |
| I have strong working relationships with complementary medicine practitioners. | 1.00 | .46 | - |
| I have a good understanding about the theories and practice of complementary medicine. | 0.68 | .31 | 6.61 |
| I understand the strengths and weaknesses of both conventional medicine and complementary medicine. | 0.45 | .21 | 5.04 |
| When I need to consult a complementary medicine practitioner, I am able to contact someone I know. | 1.22 | .56 | 7.93 |
| I coordinate care for my patients with both complementary and conventional practitioners. | 1.39 | .63 | 8.83 |
| When I first develop a treatment plan for patients, I consider both complementary and conventional medicine treatment options. | 1.22 | .55 | 8.15 |
| I talk to complementary medicine practitioners to develop a coordinated treatment plan for my patients. | 1.20 | .55 | 9.65 |
| Suggestions from complementary medicine practitioners outside my own medical paradigm help me care for my patients. | 1.24 | .57 | 7.33 |
| **Preparedness to discuss nonpharmacy approaches for treating (0 = *Very low*, 1 = *Low*, 2 = *Medium*, 3 = *High*, 4 = *Very high*)** | | | |
| Pain | 1.00 | .84 | — |
| Cardiovascular risk factors | 0.58 | .49 | 5.44 |
| Depression | 0.79 | .67 | 7.63 |
| Gastrointestinal diagnoses | 0.63 | .53 | 6.05 |
| **Whole health practices (0 = *Very unlikely*, 1 = *Unlikely*, 2 = *Likely*, and 3 = *Very likely*)** | | | |
| Integrate mindful awareness in your interactions with veterans? | 1.00 | .35 | — |
| Ask veterans what really matters in their lives so the decisions made are patient-driven? | 0.80 | .28 | 8.34 |
| Encourage the use of self-care strategies with veterans (eg, mindful awareness, movement, nutrition)? | 0.98 | .34 | 9.00 |
| Use integrative health strategies during clinical encounters with the Veterans (eg, referring or using complementary modalities)? | 1.45 | .50 | 8.95 |
| Co-manage patients with practitioners outside of your medical paradigm (eg, complementary medicine)? | 1.64 | .57 | 7.91 |
| Use or refer to the "Circle of Health" during clinical encounters? | 1.06 | .37 | 7.97 |
| Use or refer to the Patient Health Inventory during clinical encounters? | 1.20 | .41 | 7.28 |
| **Whole health practice behavior (0 = *None of the time*, 1 = *Some of the time*, 2 = *A lot of the time*, 3 = *All of the time*)** | | | |
| Integrate mindful awareness in your interactions with veterans? | 1.00 | .47 | — |
| Ask veterans what really matters in their lives so the decisions made are patient-driven? | 1.01 | .48 | 6.77 |
| Encourage the use of self-care strategies with Veterans (eg, mindful awareness, movement, nutrition)? | 1.26 | .60 | 9.75 |
| Use integrative health strategies during clinical encounters with the veterans (eg, referring or using complementary modalities)? | 1.27 | .60 | 7.33 |
| Co-manage patients with practitioners outside of your medical paradigm (eg, complementary medicine)? | 1.08 | .51 | 6.29 |
| Use or refer to the "Circle of Health" during clinical encounters? | 0.99 | .47 | 7.07 |
| Use or refer to the Patient Health Inventory during clinical encounters? | 0.85 | .41 | 6.32 |

[a]All loadings significant 2-tailed, *P* < .001. Standardized loadings are latent variable standardized.

items of the same factor if modification indices suggested statistically significant model improvement. Within-scale measurement errors were especially correlated for WHP intentions and WHP behaviors. This decision of course improved model fit indices and it had a very minimal impact on structural relations and factor loadings. More specifically, statistical significance decisions did not differ for the final measurement and structural models reported except for one structural path in the final model reported (between comfort discussing nonpharmacy approaches and behavior) becoming marginally significant when measurement errors were allowed to correlate. As can be seen in Table 1, all loadings on the presumed factors were statistically significant and as can be seen in Table 2, all measures of internal consistency were

**Table 2.** Cronbach's Alpha and Raykov's Omega for Latent Variables.

| Scale | α | ω |
| --- | --- | --- |
| Self-efficacy | .82 | .80 |
| Institutional support for PCC | .77 | .78 |
| CAM attitudes | .87 | .86 |
| Preparedness for nonpharmacy approaches | .79 | .79 |
| WHP intentions | .85 | .84 |
| WHP behavior | .83 | .82 |

Abbreviations: CAM, complementary and alternative medicine; PCC, patient-centered care; WHP, whole health practices.

acceptable ($\alpha \geq .77$, $\omega_{\text{Raykov}} \geq .78$). Table 3 presents measures of model fit for our models. For our measurement model allowing correlated measurement errors (column 2), the root mean square error of approximation (RMSEA = .047; 95% CI .041-.053; $P = .777$), as well as fit indices (goodness-of-fit index [GFI] = .971 and adjusted GFI [AGFI] = .962), suggested the model fit the data reasonably well. Not surprisingly, the overall test of the model was statistically significant with our smaller sample size, $\chi^2(507) = 827.67$, $P < .001$.

Adding the structural relationships proposed by the TPB between our latent variables significantly improved model fit relative to the measurement model, $\Delta\chi^2(4) = 18.39$, $P = .001$. This structural model (column 3) also fit the data reasonably well (RMSEA = .048; 95% CI .042-.054; $P = .699$; GFI = .971 and AGFI = .962). Figure 1 presents the path coefficients for the structural model. It becomes immediately clear that self-efficacy and preparedness to discuss nonpharmaceutical approaches to care during clinical encounters (both identified as perceived behavioral control) had the strongest impact on intentions to engage in WHP. Furthermore, CAM attitudes had a marginal impact on WHP intentions and institutional support for PCC had almost no impact on WHP intentions. Model fit was not improved by dropping the path between institutional support for PCC and WHP intentions, $\Delta\chi^2(1) = 0.33$, $P = .566$, so we left the path in the model as this relationship was predicted. WHP intentions were strongly related to engaging in WHP behavior.

As perceived behavioral control can have a direct impact on behavior, we also examined whether the same model adding direct paths between self-efficacy and preparedness for nonpharmacy approaches to WHP behavior. Comparing this model with the measurement model only, model fit was improved by adding these direct paths, $\Delta\chi^2(2) = 13.03$, $P = .001$. As can be seen in Figure 2, most of the structural relationships remained similar with one notable exception. Specifically, our perceived behavioral control variables had medium-sized relationships with intentions to engage in WHP in both models, and the relationship between intentions and behaviors was attenuated, but still significant in this model adding direct paths. Model fit indices were similar to the prior structural model, as can be seen in column 4 of Table 3.

## Discussion

The results suggest that the TPB serves as a reasonable model for explaining the relationship between attitudinal and behavioral control measures and the integration of whole health strategies during clinical encounters. It appears that perceived behavioral control, operationalized here as self-efficacy to engage in the whole health strategies presented during the course and preparedness to discuss non-pharmaceutical approaches to care, had the largest impacts on integration of whole health strategies in clinical practice (through intentions to engage in WHP). Furthermore, perceived behavioral control directly affected WHP. Attitudes toward integrative health had a small influence on engaging in WHP during clinical encounters. Interestingly, subjective norms, defined as perceived institutional support for PCC were unrelated to intentions to engage in whole health strategies. It may be that perceived institutional support may not represent the most salient norms that impact change in clinical practice among Veterans Affairs clinical providers.

The authors could not identify other prospective studies reporting on the use of the TPB to predict integration of IM strategies into clinical care. A similar cross-sectional study of physicians, residents, and medical students in Canada used the TPB to predict intentions to use CAM. Consistent with our findings, behavioral control had a stronger association with intentions to engage in CAM use than subjective norms.[27] In contrast, another cross-sectional study using the TPB to predict CAM use among health care providers found a stronger association with CAM attitudes[28] than behavioral control; although, behavioral control was measured with a single item,[28] and thus these findings could be a result of increased measurement error due to the idiosyncratic characteristics of a single item. A cross-sectional international survey of psychologists in 3 countries (including the United States) found that that previous CAM training and CAM attitudes were associated with CAM use.[33] Perceived behavioral control was not tested in this model; however, it is possible that past training in CAM may lead to increased feelings of behavioral control.

Finally, a meta analyses including 44 prospective studies examined the utility of the TPB for other health-seeking behaviors. This meta-analysis was not focused on integration of IM into clinical encounters and instead assessed health-seeking behaviors among the general population.[24] The authors similarly found that perceived behavioral control and self-efficacy tended to have the strongest relationship with intentions and behavior, while subjective norms tended to have a weaker association. The authors suggest that a lack of relationships with subjective norms may be due to some constructs not identifying the subjective norms most salient to behavior change.[24] In this meta-analytic review, the correlation of perceived self-efficacy with intention was high ($r = .44$), similar to our findings. Further in this same meta-analytic review, perceived behavioral control was also strongly associated with intentions ($r = .44$),[24] while our measure of perceived behavioral control (preparedness to engage in nonpharmaceutical approaches to care) was less strongly associated with intentions, but was larger than subjective norms and attitudes.

**Table 3.** Comparison of Model Fit for the Measurement and Structural Models.

| | Measurement Model Only | Measurement Model Only (With Correlated Errors) | Adding Structural Model | Adding Behavior Control Paths to Behavior |
|---|---|---|---|---|
| Parameters | 117 | 152 | 151 | 154 |
| Model chi-square | | | | |
| $\chi^2$ | 1321.45 | 789.41 | 806.51 | 793.473 |
| *df* | 512 | 473 | 477 | 475 |
| *P* | <.001 | <.001 | <.001 | <.001 |
| RMSEA | | | | |
| Estimate | .075 | .049 | .049 | .049 |
| −95% CI | .070 | .043 | .042 | .043 |
| +95% CI | .080 | .055 | .054 | .055 |
| *P* | <.001 | .643 | .559 | .637 |
| Fit indices | | | | |
| GFI | .958 | .973 | .973 | .973 |
| AGFI | .949 | .964 | .964 | .964 |
| NFI | .691 | .816 | .812 | .815 |
| CFI | .782 | .915 | .911 | .914 |
| TLI | .762 | .899 | .896 | .899 |

Abbreviations: *df*, degrees of freedom; RMSEA, root mean square error of approximation; CI, confidence interval; GFI, goodness-of-fit index; AGFI, adjusted goodness-of-fit index; NFI, normed fit index; CFI, comparative fit index; TLI, Tucker-Lewis index.
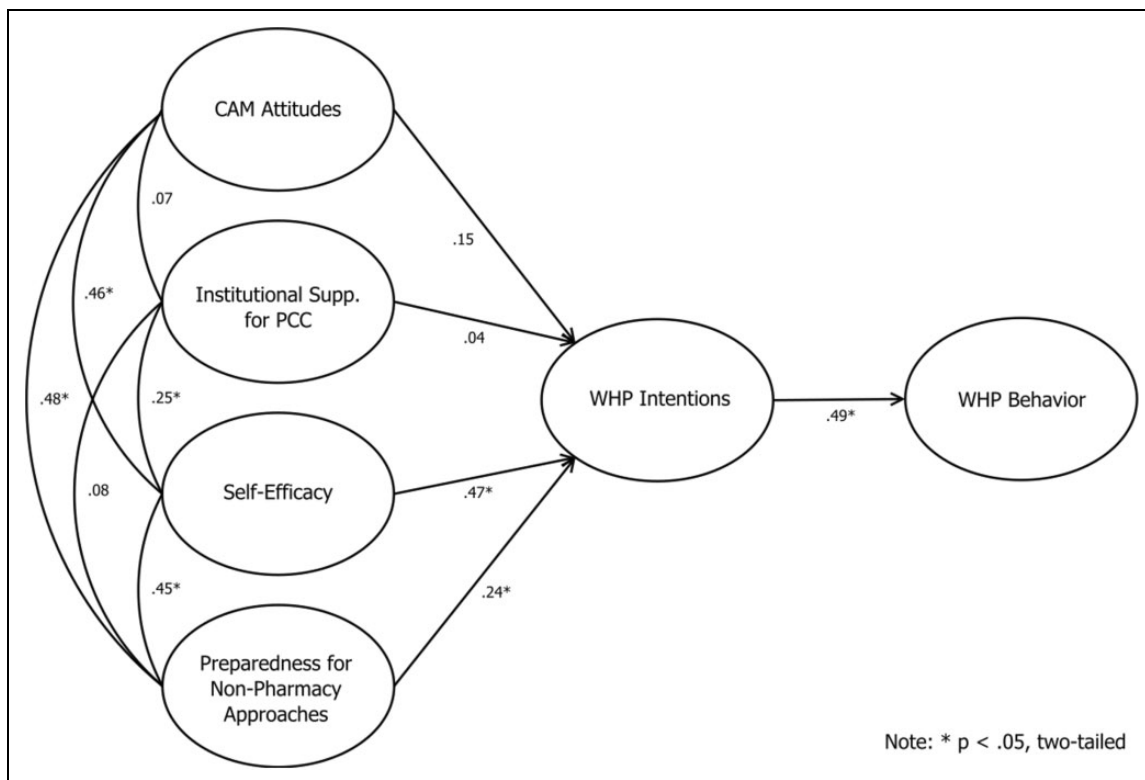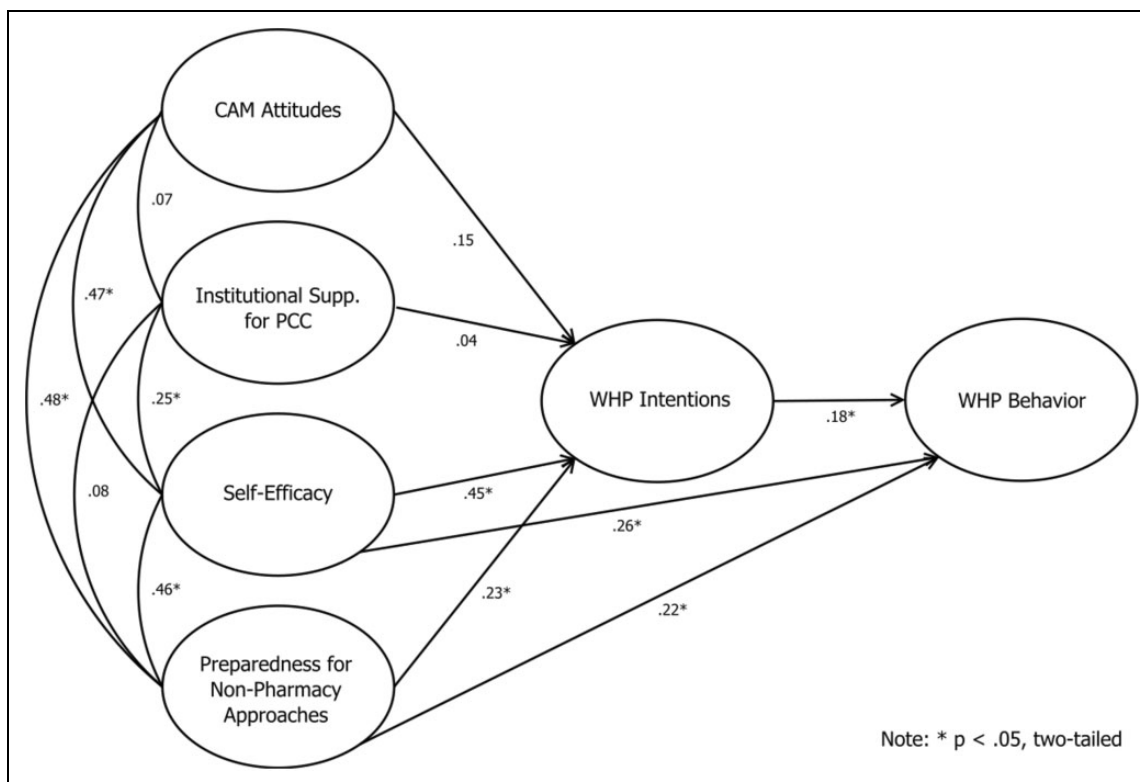


**Figure 1.** Structural model proposed by the theory of planned behavior. CAM, complementary and alternative medicine; PCC, patient-centered care; WHP, whole health practices.

### Limitations

The findings presented here must be considered in the context of study limitations. First, the relationships examined here are based on a sample of participants exposed to a course trying to increase WHP. These findings serve as an identification of the correlates of WHP for health care practitioners in the VHA who were exposed to the 2.5-day class, as opposed to an explanation of the correlates of WHP in clinical practice among practitioners in health care settings more generally. Second, given

**Figure 2.** Structural model proposed by the theory of planned behavior adding direct paths between perceived behavioral control and behavior. CAM, complementary and alternative medicine; PCC, patient-centered care; WHP, whole health practices.

that the course did increase most of the variables targeted, it is possible that we unwittingly created a ceiling effect, where attitudes toward CAM and institutional support were consistently high at immediate posttest, and consequently they had small relationships with intentions to engage in WHP at immediate posttest. If this were the case, we would expect to see higher levels of negative skew with more scores congregating at the upper end of the distribution, which we did not find. Examining significance of distributional skew at each wave, there was really more evidence to suggest that there was less negative skew at posttest for (unit weighted) attitudes toward CAM ($z_{w1} = 1.80$, $P = .07$; $z_{w2} = 1.15$, $P = .25$; $z_{w3} = 2.72$, $P = .006$) and institutional support for PCC ($z_{w1} = -3.58$, $P < .001$; $z_{w2} = -1.73$, $P = .08$; $z_{w3} = -4.73$, $P < .001$). Also, only 1 of our 4 measures was from a validated subscale (CAM attitudes[29]). Self-efficacy, preparedness to discuss nonpharmaceutical approaches, and institutional support for PCC (representing subjective norms) were developed for the course in the absence of well-suited published measures that aligned with our course goals.

### Future Studies

While the internal consistency reliabilities of these measures were high, future studies could be strengthened by establishing well-validated measures to capture IM attitudes and IM subjective norms. Finally, as with any study wishing to *support* the null hypothesis that there is no difference between the observed

and modeled pattern of relationships, a large sample size is desired. It would be helpful to see the pattern of results presented here demonstrated with a larger sample.

### Conclusion

To our knowledge, this study was among the first to use TPB to predict integration of IM skills among clinical providers who were exposed to a brief, experiential course designed to incorporate of IM skills into clinical practice. Our findings suggest that the TPB performs reasonably well in explaining integration of IM skills into clinical practice. We found that self-efficacy to use IM approaches during clinical encounters and perceived preparedness to discuss nonpharmaceutical approaches with patients both predicted intentions and behavior. These measures had a stronger effect on intentions than CAM attitudes or subjective norms. Our findings have implications for clinical training efforts that seek to promote the integration of IH strategies into clinical encounters. These results may suggest that a key feature of brief trainings should include experiential exercises to enhance IM skills integration, which in turn may strengthen perceived self-efficacy and behavioral control, as these were most strongly associated with change in clinical practice and skills integration in our study. The Academic Consortium for Integrative Medicine and Health recommends the incorporation of experiential exercises that provide clinicians with firsthand experience, as they propose that these experiences provide opportunities for

self-reflection and enhance awareness and understanding.[21] Similarly, experiential approaches have been used in other IM curricula.[34] We would encourage facilities seeking to promote awareness and use of IM strategies to consider inclusion of experiential approaches into their dissemination strategies.

## Appendix

Key Components of Whole Health Change the Conversation Course Curricula.

| Key Components of Whole Health Course | Construct |
| --- | --- |
| • Brief experiential exercises in complementary health therapies, including mindful awareness, breathing exercises, gratitude and compassion meditation, Tai Chi, Qigong, yoga, and listening skills to provide participants with opportunities to experience these strategies for themselves. | Modeling observational learning |
| • Mock patient/provider interactions to develop patient/provider communication skills that are personalized, proactive, and patient-driven. | Skill building |
| • Participant use of illustrative tools to promote the development of patient centered goals. Tools include the "Circle of Health," which asks patient to identify areas in their life that are going well and those they would like to work and completion of the "Personal Health Inventory," a survey developed by the Veterans Affairs. The survey asks patients to rate where their health is with regard to various aspects of their social, emotional, spiritual, and physical health and then identify where they would like it to be on a 10-item scale as a way to invite the development of patient-identified goals. Participants complete these for themselves and review with a partner | Self-efficacy |
| • Presentation of recent studies comparing the clinical efficacy of integrative medicine/complementary health approaches to more traditional approaches of care. | Attitudes |
| • Through hands-on experiences, practice, and feedback encourage participant self-reflection about how they might integrate some of these strategies into their own clinical practices and their own lives. | Intentions |
| • Use of small group discussions to ensure engagement and inviting the active involvement of local Veterans Affairs leadership to support cultural transformation within each Veterans Health Administration facility. | Subjective norms |

## Authors' Note

The views expressed in this article are those of the authors and do not necessarily reflect the views of the US Veterans Health Administration or the US Government.

## Author Contributions

SRS contributed to the writing of, conceptualization of, and the analysis for the article. KA contributed to the writing of and

conceptualization of the article. WS, DAC, AR, BK, and TG contributed to the writing of and review of the article.

## Ethical Approval

All research activities were approved by the Pacific Institute for Research and Evaluation's Institutional Review Board.

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