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The role of training preparedness in physical therapists' readiness to deliver psychologically informed care: a cross-sectional survey

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Abstract

Background: Psychologically Informed Physical Therapy (PIPT) is an evidence-based approach for managing musculoskeletal pain, yet its uptake in routine physical therapy practice remains inconsistent. Understanding factors that influence physical therapists' readiness to implement PIPT may help address the implementation gap.

Objective: To examine how perceived adequacy of training relates to physical therapists' implementation intentions to deliver PIPT, and to identify belief-based mechanisms that may mediate this relationship using a Theory of Planned Behavior-informed framework.

Methods: A cross-sectional survey was administered to licensed PTs who were members of the Academy of Orthopedic Physical Therapy. Measures assessed perceived adequacy of training, attitudes towards PIPT, self-efficacy, perceived controllability, and implementation intentions. A path model using structural equation modeling with observed variables was estimated to examine direct and indirect associations, with bootstrapped confidence intervals used to test mediation effects.

Results: Data from 260 physical therapists were analyzed. Perceived adequacy of training was positively associated with implementation intentions both directly and indirectly through attitudes and self-efficacy. Self-efficacy demonstrated the strongest association with implementation intentions and accounted for the largest indirect effect. Attitudes also partially mediated the relationship between training adequacy and implementation intentions. Perceived controllability was not independently associated with implementation intentions in the final model. The model explained approximately 48% variance in implementation intentions.

Conclusion: Perceived adequacy of training and self-efficacy are key determinants of physical therapists' readiness to implement psychologically informed care. Educational strategies that enhance clinicians' confidence and belief-based preparedness may be critical for supporting uptake of PIPT in clinical practice.

Introduction

Psychologically informed physical therapy (PIPT) is widely endorsed as an evidence-based approach for managing musculoskeletal pain, yet its routine implementation in clinical practice remains inconsistent (1,2). Contemporary clinical guidelines (3,4) for the management of chronic and persistent pain recommend that practitioners adopt a biopsychosocial model framework for both evaluation and treatment. Physical therapists (PTs) are well positioned to offer biopsychosocial care, as they are often the first-line practitioners seen for musculoskeletal disorders and engage in repeated interactions with patients over time. In response to this alignment between professional role and clinical need, Main and George articulated the concept of psychologically informed physical therapy as an approach that integrates traditional physical therapy interventions (e.g. therapeutic exercise) with cognitive and behavioral therapies (i.e. relaxation techniques, activity pacing) to address both the physical and psychological dimensions of pain (Main & George, 2011). Despite broad endorsement of this approach, translation of PIPT into routine physical therapy practice has remained variable and incomplete.

A qualitative study on perceptions of PTs towards management of low back pain from a biopsychosocial perspective found that while PTs understand the multifaceted nature of pain, they struggle to address psychological factors due to a lack of preparedness and time, instead preferring a biomedical approach (Cowell et al., 2018). These findings are consistent with a systematic review and meta synthesis demonstrating that PTs face persistent barriers to implementing biopsychosocial interventions, including limited confidence, role uncertainty, and perceived scope-of practice constraints (5). Pragmatic trials investigating the effectiveness of PIPT in clinical settings (Cherkin et al., 2018; Delitto et al., 2021) (1) have shown implementation challenges including clinician attitudes and beliefs, concerns over scope of practice and a lack of preparation to meet the demands of integrating psychosocial interventions into their already existing care paradigm. Thus, while PTs recognize the importance of a biopsychosocial perspective in clinical care, there continues to be a gap in the implementation of this holistic care in the clinic. To better understand why this gap persists, this study applies a behavioral theory framework to examine belief-based determinants of physical therapists' intentions to implement PIPT.

Theoretical Framework

The Theory of Planned Behavior proposes that intentions to perform health behaviors are shaped by belief-based constructs including attitudes, social norms, and perceived behavioral control (Ajzen, 1991). The theory indicates that an individual's *attitude* about a behavior is determined by their belief about the outcome of that behavior. A person's *social norm* reflects perceived endorsement by valued others. For example, do PTs perceive other PTs to be doing this work and are they motivated to follow these examples? *Perceived behavioral control* is determined by factors that facilitate or impede the behavior. Thus, a PT may have positive attitudes and supportive social norms but lack control over the situation. This is further described by Ajzen as being comprised of two components: controllability and self-efficacy (Ajzen, 2002). Controllability describes one's ability to manipulate the behavior while self-efficacy describes one's confidence or ease in successfully performing the behavior.

While there are good theoretical reasons to believe that behavior would be determined by behavioral intentions the Theory of Planned Behavior alone has fallen short in reliably predicting behavior (Sheeran et al., 2001). Behavioral intentions alone account for only 20–40% of the variance in health behaviors, indicating that the intention to perform a behavior does not always result in performance of that particular behavior (Godin & Kok, 1996;

Rise et al., 2003; Wing Kwan et al., 2009). Accordingly, implementation intentions represent a pragmatic outcome for examining clinician's readiness to translate intentions into action. Implementation intentions are plans that connect the action with the cognitive response necessary to carry out the goal (Gollwitzer & Sheeran, 2006). Implementation intentions specify how, when and where one intends to achieve a specific goal (i.e. "If situation Y occurs, then I will do Z") whereas behavioral intentions only specify the desired goal to be achieved (i.e. "I intend to reach Z"). A meta-analysis by Gollwitzer and colleagues (2006) found that the formation of implementation intentions considerably increases the likelihood of attaining a goal versus simply forming the goal intentions (Gollwitzer & Sheeran, 2006). While developed for individual health intentions, this theoretical framework provides a useful perspective to consider clinician's intention to implement standards of care, and the training needed to support these efforts(6,7).

To date, little is knowing about how training-related beliefs shape physical therapists' readiness to implement psychologically informed care. Therefore, the primary objective of this study was to test a theory-informed model examining how perceived training adequacy influences physical therapists' intentions to deliver psychologically informed physical therapy, both directly and indirectly through belief-based mechanisms. Accordingly, our hypotheses were as follows 1) physical therapists' attitudes and self-efficacy regarding psychologically informed physical therapy will be positively associated with their intention to deliver such care 2) Perceived adequacy of training will be positively associated with intentions to deliver psychologically informed physical therapy, both directly and indirectly through attitudes and self-efficacy. By applying a behavioral theory framework to an implementation-relevant outcome, this study seeks to clarify which modifiable factors may be most critical for supporting intake of PIPT in clinical practice. The hypothesized relationships among training adequacy, belief-based constructs, and implementation intentions are summarized in the analytic model tested in this study (see Fig. 1).

Methods

In August 2022, physical therapists who were members of the Academy of Orthopedic Physical Therapy through the American Physical Therapy Association were invited to participate in our survey via email. Data were collected cross sectionally through an online survey hosted by Qualtrics (Qualtrics, Provo UT USA). The survey remained open until September 2022. Participants who completed the survey were entered into a lottery to win one of fifty $20 gift cards. Ethical approval for human subjects' research was obtained from the Institutional Review Board at the University of Texas at Austin.

Measures

Demographic Characteristics.

Participants reported demographic and professional data including age, gender, race, income, practice setting, and percentage of time spent in direct patient care.

Perceived Adequacy of Training

Perceived adequacy of training in psychologically informed physical therapy was assessed using a single item. Participants were provided with a definition of psychologically informed physical therapy as an approach that incorporates behavioral strategies from mental health practice into physical therapy practice (e.g. activity pacing, behavioral activation, relaxation training). Participants then rated their agreement with the statement, "I feel adequately trained to deliver psychologically informed physical therapy care" on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). Higher scores indicated greater perceived adequacy of training.

Theory of Planned Behavior-Informed Constructs

Belief based constructs were assessed using items developed in accordance with recommendations for Theory of Planned Behavior item formulation (8). Items were refined through consultation with clinicians and researchers to ensure relevance to physical therapy practice.

Attitudes towards PIPT were assessed using items capturing participants overall evaluations of delivering psychologically informed physical therapy (e.g., perceived usefulness and value of PIPT in clinical practice). Higher scores indicated more favorable attitudes.

Self-efficacy for delivering PIPT was assessed using items reflecting participants' confidence in their ability to integrate psychologically informed strategies into patient care (e.g., "I am confident in my ability to build psychologically informed care into the plan of care for my patients"). Higher scores reflected greater perceived confidence.

Perceived controllability was assessed using a single item reflecting participants perceived control over the decision to deliver PIPT ("The decision to deliver psychologically informed physical therapy to my patients is not up to me"). This item was reverse coded such that higher scores indicated greater perceived controllability.

Items were rated on a 7 -point Likert scale (1 = strongly disagree to 7 = strongly agree). Scores were summed within constructs, with higher scores indicating stronger endorsement of each belief-based factor. Details regarding item development, factor analytic procedures, and psychometric evaluation are provided in Appendix A.

Implementation Intentions

Implementation intentions to deliver psychologically informed physical therapy were assessed using three items based on Gollwitzer's conceptualization of implementation intentions as goal-directed action plans specifying when, where and how a behavior will be enacted (9). Items assessed whether participants had formed concrete plans regarding delivery of PIPT (e.g. planning when to deliver PIPT, identifying appropriate patient situations, and determining how PIPT strategies would be incorporated into care). Participants rated the likelihood of each item on a 7-point scale ranging from 1 (extremely unlikely) to 7 (extremely likely). Items were summed to create a total implementation intention score, with higher scores indicating greater readiness to enact PIPT in clinical practice.

Data Analysis

All analyses were conducted using R statistical software (version 4.0.2 (10). Descriptive statistics and Pearson correlation coefficients were calculated to examine relationships among study variables. A path model using structural equation modeling was then estimated to examine direct and indirect relationships among perceived adequacy of training, belief-based constructs (attitudes, self-efficacy and perceived controllability), and implementation intentions. Indirect effects were estimated using bias-corrected bootstrap procedures with 5,000 resamples. Given the focus on observed variables and the just-identified nature of the final model, interpretation centered on parameter estimates and indirect effects rather than global model fit indices.

Results

Sample Demographics

Two hundred and ninety-one physical therapists completed our survey. Of these responses, 31 were incomplete and therefore eliminated from our analysis. Participant demographic characteristics are summarized in Table 1. The majority were female (60.2%) with an average age of 35–44 (32.5%) and a median income of USD 90,000–99,000. Ninety five percent of participants were non-Hispanic with 92% identifying as white or Caucasian decent. The median for time spent in direct patient care was 81% of a workday. These data indicate that our sample of participants were consistent with national averages with the exception of income and race. The average income for the participants in our study is higher than the national average of USD 74,972. Likewise, the majority of physical therapists in the United States are less likely to report being white (75.6%) and more likely to report being of Asian descent (12.2%).

Table 1
Demographic Characteristics

Characteristics	Frequency	Percent*
Gender		
Female	174	60.2
Male	115	38.75
Age		
<35–44	95	32.8
45–54	78	26.9
55–64	58	20.0
65–74+	58	20.0
Income		
< $50,000	20	6.9
$50,000–59,000	11	3.8
$60,000–69,000	9	3.1
$70,000–79,000	53	18.3
$80,000–89,000	43	14.9
$90,000–99,000	58	20.0
$100,000- 149,000	75	30.0
> $150,000	16	5.5
Race		
Caucasian/White	266	92.0
Asian	19	6.5
African American/Black	2	0.006
Native Hawaiian, Pacific Islander	2	0.006
Setting		
Private Practice	129	45.7
Hospital	92	32.6
Home Health	4	0.01
Other	59	20.9
*based on number of responses in each category		

Preliminary Analyses

Descriptive statistics and zero order correlations for the main constructs are given in Table 2. Perceived adequacy of training demonstrated a strong positive correlation with implementation intentions ($r = 0.60$, $p < 0.001$). Attitudes toward psychologically informed physical therapy and self-efficacy were also strongly correlated with implementation intentions (attitudes: $r = 0.66$, $p < 0.001$; self-efficacy: $r = 0.65$, $p < 0.001$). Correlations among the belief-based constructs were moderate to strong and in the expected directions, supporting the plausibility of the hypothesized mediation model. Perceived controllability demonstrated weaker bivariate associations with implementation intentions relative to belief-based constructs. The final path model was just-identified (df = 0); accordingly, global model fit indices were not interpretable, and results are presented in terms of direct and indirect effects. Descriptive statistics and zero-order correlations for all study variables are presented in Table 2.

Table 2
Descriptive Statistics and correlations among the constructs

Measure	M	SD	N	Income	Training	Attitudes	Social Norms	Perceived Behavioral Control	Self-Efficacy	Behavioral Intentions	Implementation Intentions
Income			286	1.00							
Training			263	0.11	1.00						
Attitudes	17.02	3.47	260	-0.01	0.59**	1.00					
Social Norms	10.79	.85	262	0.00	0.04	0.31*	1.00				
Perceived Behavioral Control	10.03	2.62	262	0.11	0.22**	0.32*	0.07	1.00			
Self-Efficacy				0.06	0.69**	0.51*	0.06	0.26	1.00		
Behavioral Intentions	24.31	3.69	260	0.01	0.59**	0.66**	0.18*	0.37**	0.65**	1.00	
Implementation Intentions	11.46	6.59	260	0.16*	0.60**	0.50**	0.08*	0.19**	0.65**	0.57*	1.00
* indicates p value < 0.05, ** indicates p value < 0.01											

Structural Equation Model

Direct Effects

Standardized direct and indirect effects from the path model are summarized in Table 3. Perceived adequacy of training demonstrated significant direct associations with both belief-based mediators. Training adequacy was positively associated with attitudes towards psychologically informed physical therapy (standardized β = 0.59, p < .001) and with self-efficacy for delivering psychologically informed physical therapy (standardized β = 0.69, p < .001). Self-efficacy emerged as the strongest predictor (standardized β = 0.41, p < .001) in the model predicting implantation intentions, followed by attitudes (standardized β = 0.17, p < .001). Training adequacy also demonstrated a significant direct association with implementation intentions after accounting for the mediators (standardized β = 0.22, p < .001). Perceived controllability was not significantly associated with implementation intentions (standardized β = -0.02, p = .70).

Table 3
Standardized Direct and Indirect Effects Predicting Implementation Intentions

Path	*Standardized β*	*SE*	*z*	p value	95% Bootstrap CI
Direct Effects					
Training adequacy → Attitudes	0.59	0.07	8.86	< .001	[0.46, 0.72]
Training adequacy → Self-efficacy	0.69	0.05	14.11	< .001	[0.59, 0.78]
Attitudes → Implementation intentions	0.17	0.05	3.19	0.001	[0.07, 0.27]
Self-efficacy → Implementation intentions	0.41	0.06	6.46	< .001	[0.29, 0.53]
Training adequacy → Implementation intentions	0.22	0.07	3.29	.001	[0.09, 0.35]
Perceived controllability → Implementation intentions	-0.02	0.05	-0.39	.695	[-0.12, 0.08]
Indirect Effects					
Training → Attitudes → Implementation intentions	0.10	0.04	3.17	.002	[0.04, 0.18]
Training → Self-efficacy → Implementation intentions	0.39	0.05	7.34	< .001	[0.19, 0.38]
Total Indirect Effect	0.39	0.05	7.34	< .001	[0.29, 0.50]
Total effect of training adequacy	0.61	0.05	13.41	< .001	[0.51, 0.71]
Note. Standardized coefficients (β) are reported. Indirect effects were estimated using bias-corrected bootstrap procedures with 5,000 resamples. Confidence intervals that do not include zero indicate statistically significant effects.					

Indirect Effects

Bootstrapped mediation analyses indicated significant indirect effects of training adequacy on implementation intentions through both belief-based constructs. The indirect effect through attitudes was statistically significant (standardized indirect effect = 0.10, p= .002). The indirect effect through

self-efficacy was larger and statistically significant (standardized indirect effect = 0.28, $p < 0.001$). The total indirect effect of training adequacy on implementation intentions was significant (standardized indirect effect = 0.39, $p < 0.001$). The total effect of training adequacy on implementation intentions, reflecting both direct and indirect pathways, was also significant (standardized total effect = 0.61, $p< .001$), indicating partial mediation.

Explained Variance

The model accounted for a substantial proportion of variance in the endogenous variables. Training adequacy explained 35% of the variance in attitudes and 47% of the variance in self-efficacy. Together, training adequacy, perceived controllability, attitudes, and self-efficacy explained 48% of the variance in implementation intentions.

Discussion

This is the first study to use behavioral theory, specifically the Theory of Planned Behavior to examine the intentions of physical therapists to deliver psychologically informed care. Three key findings emerged from our study: (1) perceived adequacy of training and self-efficacy were strong predictors of whether a physical therapist intends to deliver PIPT, (2) attitudes towards PIPT partially mediated the relationship between perceived adequacy of training and intentions; and (3) self-efficacy also partially mediated this relationship, with a larger indirect effect. Together, these findings indicate that perceived training adequacy operates both directly and indirectly to influence implementation intentions, primarily through belief-based mechanisms.

Although attitudes, self-efficacy, and perceived controllability were associated with intentions at the bivariate level, only attitudes and self-efficacy remained significant predictors in the final structural model. In agreement with the Theory of Planned Behavior (Ajzen, 1991), our study found attitudes and perceived behavioral control to be positively correlated with intentions to deliver PIPT, consistent with prior research measuring other health professional behaviors (Godin & Kok, 1996). However, belief-based constructs (i.e. self-efficacy and attitudes) demonstrated the strongest independent association with intention formation, whereas perceived controllability did not contribute uniquely once other factors were accounted for. This pattern is consistent with contemporary applications of the reasoned action approach, which emphasize attitudes and self-efficacy as proximal determinants of intention formation and as key mediating mechanisms linking antecedent beliefs to action readiness (11). These findings align with evidence specific to physical therapy practice, as a systematic review by Gardner et al. (2017)(12) demonstrated that clinicians' attitudes and beliefs meaningfully influence their willingness to integrate psychologically informed care into routine practice.

Our findings indicate that perceived adequacy of training is a central determinant of implementation intentions, exerting both direct and indirect effects through belief-based mechanisms. This is unsurprising, as clinicians are more likely to adopt interventions that align with their training and treatment philosophies (Learman et al., 2014), which are largely established in their initial and continuing training. Although PTs generally recognize the role of psychosocial factors in pain management (Cowell et al., 2018), they continue to report a limited competence in adopting of a biopsychosocial model of care (Foster & Delitto, 2011). This gap may reflect a lack of consensus regarding pain-related curricula across educational programs (Emerson et al., 2022). Supporting this concern, Hoeger Bement and Sluka (2015)(13) reported that Doctor of Physical Therapy programs devoted an average of 31 contact hours to pain education, with only 61% (n = 216) of indicating this exposure was sufficient to prepare future clinicians (Hoeger Bement & Sluka, 2015). Despite a strong body of literature supporting psychologically informed care (Cherkin et al., 2018; Coronado et al., 2020; Delitto et al., 2021), PTs consistently report low confidence in delivering cognitive and behavioral components of pain management (Ballengee et al., 2021; Holopainen et al., 2020; Synnott et al., 2015).

To our knowledge, this is the first study to measure self-efficacy related to screening, interpreting and delivering PIPT among physical therapists. Self-efficacy emerged as the strongest belief-based predictor of intention to deliver PIPT in our sample and partially mediated the relationship between perceived adequacy of training and implementation intentions. This suggests that clinicians who perceive themselves as adequately trained are more likely to form implementation intentions because they feel confident in their ability to assess psychosocial factors, interpret findings, and integrate psychologically informed strategies into care. Consistent with this interpretation, a metanalysis found that current training approaches are often insufficient for fostering self-efficacy in delivering biopsychosocial interventions (Holopainen et al., 2020). Delivering PIPT requires familiarity with a range of techniques including educational strategies (i.e. threat reduction (Nicholas & George, 2011)), behavioral change (i.e. adaptive behaviors (Main et al., 2015)), cognitive-behavioral (i.e. coping skills (Flor & Turk, 2011)), psychophysiological (i.e. mindfulness (Harrison et al., 2019)) and contextual cognitive-behavioral therapy (i.e. acceptance and commitment therapy (Aghayousefi et al., 2017)) (Keefe et al., 2018). Given the breadth of skills required, difficulty integrating PIPT into existing care paradigms is not unexpected. Importantly, our findings suggest that enhancing self-efficacy ma represent a critical leverage point for increasing clinicians' readiness to implement PIPT. Accordingly, physical therapy education and continuing professional development should prioritize strategies known to strengthen self-efficacy, including skills practice in low stakes environments (REF), vicarious learning through observation of proficient clinicians, and verbal encouragement from mentors(Bong, 2013).

Several limitations should be considered. First, the cross-sectional design precludes conclusions regarding causal relationships between beliefs, intentions, and clinical behavior. The Theory of Planned Behavior emphasizes the link between intention and behavior; however, our design did not permit examination of actual delivery of PIPT in practice. Longitudinal studies are needed to evaluate whether belief-based determinants predict sustained implementation of psychologically informed care. Second, although our study included theory-driven scale development and preliminary

psychometric evaluation, perceived controllability and self-efficacy emerged as distinct constructs rather than a unified perceived behavioral control factor. This distinction, supported by prior literature (14,15), may be particularly relevant for frontline healthcare providers whose control over care delivery is constrained by external factors such as productivity demands and time limitations. While our scales demonstrated strong internal consistency, further validation across diverse samples is warranted. The observed partial mediation also suggests that additional mechanisms not captured in the current model may contribute to intention formation, highlighting opportunities for future research informed by complementary behavioral theories.

Finally, this study did not assess patient outcomes or actual clinical behaviors associated with varying levels of implementation intentions. Although beyond the scope of the present investigation, examining whether intention formation translates into meaningful changes in care delivery and patient outcomes represents an essential next step. The absence of observed effects of biopsychosocial approaches in some clinical settings may reflect gaps in training and clinician confidence rather than limitations of the approach itself. Additionally, because the final path model was just-identified, global fit indices could not be evaluated; therefore, findings should be interpreted based on parameter estimates and indirect effects rather than overall model fit.

Conclusion

This study demonstrates that perceived adequacy of training, attitudes, self-efficacy, and perceived controllability collectively account for a substantial proportion of variance in physical therapists' intentions to deliver psychologically informed physical therapy. Among these factors, training adequacy and self-efficacy emerged as the most influential pathways to intention formation. These findings underscore the importance of educational strategies that strengthen clinicians' confidence and belief-based readiness to delivery psychologically informed care and provide clear targets for intervention at both entry-level and continuing education stages.

Abbreviations

PIPT
Psychologically Informed Physical Therapy
PT / PTs
Physical Therapist(s)
USD
United States Dollar(s)
df
degrees of freedom
r
Pearson correlation coefficient
p
p-value
e.g.
exempli gratia (for example)
i.e.
id est (that is)

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval for human subjects' research was obtained from the Institutional Review Board (IRB) at the University of Texas at Austin. All participants were provided with information describing the study purpose, voluntary nature of participation, and data confidentiality prior to completing the survey. Informed consent to participate was obtained from all participants electronically prior to data collection.

Consent for publication

Not applicable. This manuscript does not contain data from any individual person, including individual details, images, or videos.

Availability of Data and Materials

The data that support the findings of this study are available upon request. Our analysis data and raw data are available. No identifiable data are available. These data may be reused for replication of this study. To request data, please contact Rupal M Patel at rupal@utexas.edu.

Competing Interests

The authors report there are no competing interests to declare.

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Authors' Contributions

RMP and JBB conceptualized and designed the study, conducted the data analysis, and drafted the manuscript. BA formatted and prepared the manuscript for publication. All authors reviewed and approved the final manuscript.

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Figures

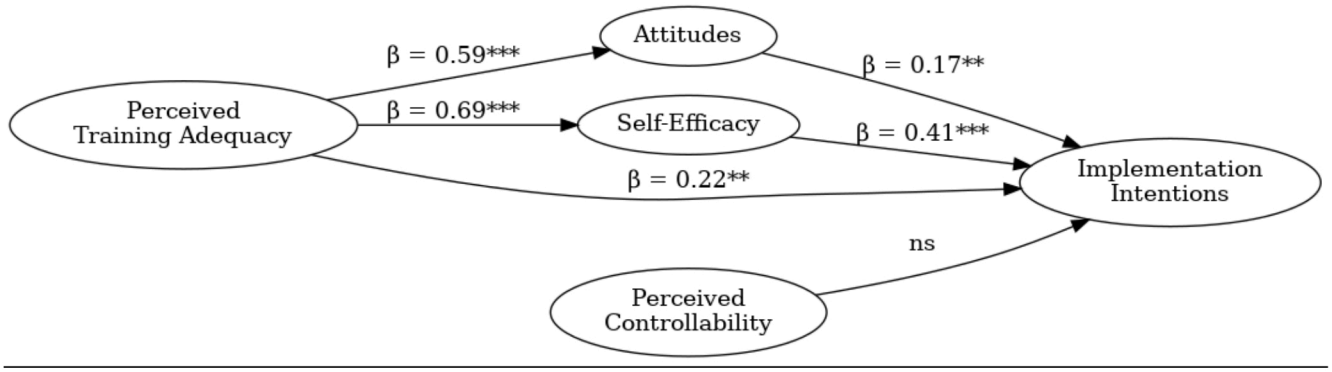

Figure 1

Empirically derived factor structure of TPB-informed measures