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School-Based Physical Therapy Services: Predicting the Gap between Ideal and Actual Embedded Services

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Abstract

Purpose: To ascertain the variables predicting the gap between ideal and actual practice in embedding school-based physical therapy services.

Methods: School-based physical therapists completed an online survey estimating ideal and actual practice of embedding physical therapy services. Predictive modeling was used to determine whether disability, interventions, goals, families, teachers, workload, billing, and/or contracts predicted the gap between estimated ideal and actual practice.

Results: Data from 410 participants revealed severity of students' disability, billing, written contracts, and families' preferences predicted the gap between estimated ideal and actual services. Actual practice varied based on region, American Physical Therapy Association membership, and Academy of Pediatric Physical Therapy membership.

Conclusions: Our model predicts the gap between estimates of ideally and actually embedding school-based physical therapy services. While 4 variables predicted the gap, further research is needed to develop a predictive model of actual practice to inform school-based PT practice.

The Individuals with Disabilities Education Improvement Act of 2004 (IDEA) mandates students receive their special education and related services in regular education environments (e.g., classrooms, hallways, playgrounds) unless students are unsuccessful in those environments with supports and services.[1] In the educational environment, physical therapists, as related services providers, should embed their services within students' regular routines and activities, such as moving through classroom centers or climbing on playground equipment during recess.[2] School-based physical therapists (SBPTs) acknowledge they do not always provide therapy services in regular or natural education environments.[3] In a recent survey,[4] SBPTs rated statements about their school-based physical therapy practice. Using a Likert scale to estimate their actual practice and thoughts about their ideal practice, 80% of SBPTs reported it was always or usually ideal to provide services in students'

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natural school environments. However, only 57% reported actually providing services in these settings always or usually, suggesting a gap existed between estimated ideal and actual practice for SBPTs that has remained consistent over 20 years.[3, 4]

Research regarding the gap between estimated ideal and actual practice for physical therapy (PT) services embedded in students' routines and activities is limited. Family preference, therapy techniques or interventions, and Individualized Family Service Plan goals predicted the gap between estimated ideal and actual practice in early intervention[5] suggesting that these 3 variables may influence physical therapists' ability to embed services and may contribute to the gap between ideal and actual practice in early intervention. However, service delivery and team decision making differs between early intervention and school-based services due to children's ages and team member composition.[1] A predictive model for early intervention services cannot be applied directly to school-based PT services leaving SBPTs without evidence about potential contributing variables such as family preferences, therapy techniques and intervention, and individualized student programs, that might improve their actual school-based practice.

Based on IDEA,[1] the gap could be predicted by the severity of students' disability if Individualized Education Program (IEP) teams are individualizing service location based on students' disability related educational needs. Currently, no theories or predictive models exist to assist in decreasing the gap between SBPTs estimated ideal and actual practice related to embedding PT services into student's natural school environment. Predictive modeling helps identify the relationships between variables, which could lead to new theories.[6]

Although research describing potential variables that could influence embedding therapy services within students' natural routines and activities is sparse, evidence suggests conflicting influences of additional potential variables. SBPTs reported that teachers' preference for, and parents' expectation of, pull-out therapy were barriers to embedding therapy services.[7] However, SBPTs also reported that teachers' support is critical for embedded services[8] and could influence embedding services. Thus, the influence from parents and teachers may either positively or negatively contribute to the estimated gap between ideal and actual practice in school-based services. In a national study, SBPTs reported embedded services were difficult to provide when their workloads were high because high workloads may constrain scheduling services during students' routines and activities (e.g., during recess).[7] However, SBPTs in the northeast United States had potentially lower workloads based on student to therapist ratios[9], and recommended fewer embedded services suggesting that lower workloads may be associated with fewer embedded services.[10] Consequently, the influence of SBPTs' workload also is unclear.

While the above variables have some evidence, other possible variables are based on researchers' hypotheses. For example, SBPTs may be discouraged from embedding services so they can bill and be reimbursed from third-party payors.[4] Districts may discourage embedding services by only reimbursing contracted SBPTs for direct services in isolated settings.[3] Understanding the influence of these variables on the gap between ideal and actual practice may help inform SBPTs' practice.

The purposes of this study were to determine SBPTs' estimated difference between ideally and actually embedding school-based PT services and to ascertain the variables predicting the estimated difference between ideally and actually embedding school-based PT services. The 8 variables of interest include severity of students' disability (disability), PT interventions (interventions), students' IEP goals (goals), inferred family preference (family), inferred teacher preference (teacher), SBPTs' workload (workload), ability to bill third party payors (billing), and district written contracts that reimburse only for direct services (contracts).

METHODS

Study Procedures and Participants

We used a nationwide online survey in our exploratory prospective study. Following the institutional review board approval, we shared the website link through the American Physical Therapy Association's (APTA) Academy of Pediatric Physical Therapy (APPT) newsletter, the APPT's school-based special interest group's email list, and the PT COUNTs email database.[11] Using respondent driven sampling,[12] a form of snowball technique, participants/respondents were encouraged to invite other SBPTs to complete the survey via their own email or the research website generated email. Inclusion criteria were licensed physical therapists, practicing at least 1 year in school-based PT, between the ages of 23 and 64 years, and currently practicing in a U.S. school setting. Data collection occurred between August and November 2017.

Based on having 8 independent variables, we estimated needing at least 30 participants per variable to ensure reasonable predictive power of our model. Because we used a stepwise procedure, we increased the sample size to 50 participants per variable resulting in a needed sample size of 400 completed surveys.[13]

Instrument

We developed an online survey based on a review of the literature regarding school-based practice. Online surveys can quickly reach large number of participants in a short time.[14] The survey included 57 questions divided into 3 parts: inclusion, demographic, and school-based service questions (Supplemental Digital Content 1). The school-based service questions addressed SBPTs' estimated ideal (n = 21) and actual (n = 21) percentage of services embedded in students' routines and activities based on 8 variables: a) disability, b) interventions, c) goals, d) family, e) teacher, f) workload, g) billing, and h) contracts. Embedded in students' routines and activities was operationally defined as providing services (intervention, treatment, etc.) in the classrooms, gymnasiums, playgrounds, etc. as part of the students' typical activities (e.g., participating in physical education class, playing at recess). We asked what percentage of students on SBPTs' caseloads actually received embedded PT services based on each variable. We then asked what percentage of students they thought should ideally receive embedded services based on each variable. To reduce response burden for SBPTs, answer choices for the school-based service questions were ordinal percentage ranges (0-20%, 21-41%, 41-60%, 61-80%, 81-100%). Actual practice questions included the additional choice of no such students on the participants' workload.

We examined content validity of the survey with 6 SBPTs and 1 early intervention physical therapist. Combined, these therapists had over 70 years of pediatric practice experience and 4 were enrolled in a pediatric doctor of science degree program. The 7 therapists independently took the survey and all agreed that the content reflected SBPTs' practice. Following therapists' recommendations, we changed wording to improve clarity and added 1 demographic question asking the grade level range of SBPTs' workload. The survey was completed online using the Qualtrics[15] survey system.

Data Analysis

The Qualtrics[15] participant survey data was exported into Excel, checked for completeness and found to be missing data in 8% of cells. To allow for full set analysis, we applied sequential multiple imputations, a procedure using statistics to infer best fitting answers to missing data cells.[16] Regression imputation was used for ordinal and continuous variables and logistic imputation was used for nominal variables.[16, 17] We used descriptive statistics to characterize our participants without including imputed data.

The percentage of the 21 questions for which SBPTs answered 81-100% was calculated for each participant for the estimated ideal and actual school-based service questions and became the variables *ideal* and *actual* respectively. The means of all participants' estimated *ideal* and *actual* percentages were computed to determine SBPTs' estimated difference between *ideal* and *actual* practice. We grouped the estimated *actual* percentages into 8 independent variable categories: disability (7 questions), interventions (2 questions), goals (2 questions), family (2 questions), teacher (2 questions), workload (2 questions), billing (2 questions), and contracts (2 questions). After comparing answers to ideal and actual question pairs (e.g., ideal practice versus actual practice for students with mild disabilities), the percentage of questions in which the answer was greater for ideal than actual was calculated and referred to as the *gap*. Predictive modeling analysis was performed using SAS.[18] Variables for the model were selected using stepwise linear regression procedures. The alpha level was 0.05.

We created 3 additional independent demographic variables: region, based on participants' state of residence using APPT regions (Region I West; Region II North Central; Region III Great Lakes; Region IV North East; Region V South East; Region VI South; Region VII South Central); advanced degree, based on comparing participants' entry level with their highest degree; and billing practices, based on whether or not participants reported having students on their workload for whom they could bill third-party payers. Demographic category pair means (e.g. advanced degree versus no advanced degree) were analyzed with a paired t-test for pairs with 2 categories and at least 30 participants per category; single factor ANOVA for demographic pairs were used with more than 2 categories or Kruskal-Wallis non-parametric tests when at least 1 category contained fewer than 30 participants. The alpha level was 0.05 and Bonferroni correction was used for multiple analyses.

For the school-based service question pairs (e.g., more versus fewer hands-on interventions), chi-square statistics were used to compare the frequency of answering 81-100% for *ideal* and *actual* and having a difference for *gap*. The alpha was 0.05.

RESULTS

Of 727 therapists who opened the online survey, 410 participants completed 50% or more of the questions in each section. Participants represented the majority of the United States with the exception of Alabama, District of Columbia, and Puerto Rico. Most participants were over 40 years of age (75.74%), APTA members (58.09%), APPT members (54.66%), employed by the district (65.36%), and working full time (79.85%). Although the majority of participants had over 20 years of experience as physical therapists (60.84%), the majority had 20 or fewer years of experience as SBPTs (71.57%) (Table 1.).

For SBPTs' estimated difference, the mean percentage of SBPTs who selected the 80-100% rating for ideal and actual was 50.02% and 32.56% respectively. In our predictor model, disability, billing, contracts, and family predicted the *gap* between *estimated ideal* and *actual* practice (Table 2). A change in any 1 predictor variable resulted in a change in the *gap*. This model explained approximately 47% of the variability ($R^2 = 0.4718$; adjusted $R^2 = 0.4666$). No evidence of interaction or collinearity was found; however, the residuals were non-normally distributed and heteroscedastic.

Regarding participants' demographic analysis, estimated *ideal* practice was different for advanced degree, APTA membership, APPT membership, billing, employment status (contracted, employed, other) and region, specifically regions II and III (Table 3). Estimated *actual* practice was different for APTA membership, APPT membership, billing, employment status and region, specifically regions II and III, II and IV, III and V, and IV and V. The *gap* was different for billing, employment status, years as a physical therapist, and regions specifically regions II and III, II and IV, and IV and V.

When analyzing school-based service question pairs, we found the frequency of embedding services differed for estimated *ideal* for disability, family, goal, interventions, and teacher (Table 4). The frequency of embedding services differed for estimated *actual* for disability, family, goal, interventions, teacher, and workload. The frequency of having a *gap* between estimated *ideal* and *actual* practice differed for severity of disability.

DISCUSSION

The results of our study suggest that the *gap* between SBPTs' estimates of *ideally* and *actually* embedding practice in school-based PT continues. Although SBPTs' estimates suggested that providing services during students' routines and activities is *ideal*, they estimated *actually* providing services to fewer students in those environments. Specifically, we found that a decrease of embedded services due to severity of students' disabilities, billing practices, SBPTs' employment contracts, and families' inferred preference, predicted an increase in the *gap* between embedded services SBPTs *actually* provide and the percentage SBPTs' estimate is *ideal*.

The strongest predictor in our model was disability. The frequency of SBPTs' estimates of providing embedded services and the frequency of SBPTs' estimated differences between *ideal* and *actual* practice varied between the severity levels of students' disabilities. These findings suggest that SBPTs may vary the amount of embedded services based on the nature

and severity of the student's disability.[1] Upon further analysis, SPBTs reported providing more services in natural environments for students with severe disabilities compared with students with less severe disabilities. Jeffries et al[19] determined SBPTs provided students with severe disabilities more individual and classroom based services than students with less severe disabilities. SBPTs also provided more educational, positioning, and integumentary interventions to students with severe disabilities compared with students with less severe disabilities,[19] which we hypothesize are more easily embedded than mobility type interventions. Further, SBPTs reported the least amount of differences between estimated *ideal* and *actual* practice for students with severe disabilities, indicating SBPTs are embedding services at a level similar to what they consider ideal. Although not contemporary, some may consider the natural environment for some students with severe disabilities to be segregated classrooms or schools.[20, 21] We did not query the location of students' natural environments; thus, the location of students' natural environments warrants further exploration.

Interestingly, SBPTs provided the least amount of embedded services for students with moderate disabilities. We operationally defined moderate disability as including students who use assistive devices for walking. In our study, SBPTs had the highest *gap* score for students with moderate disabilities, indicating they were *actually* providing embedded services at a level less than they reported was *ideal*. We hypothesize that SBPTs may use interventions to address balance and strength that could be difficult to embed in students' routines and activities or implement interventions that support acquiring new skills (e.g., learning to walk) that could be impractical to embed.[22] SBPTs also may start interventions in less distracted environments before embedding interventions.[23] Additional exploration is needed identifying why SBPTs' level of embedded services varies between different levels of students' disabilities and if SBPTs embed services as students' skill proficiency increases.

Our second strongest variable was billing, an interesting finding considering that services are to be provided freely and appropriately to students.[1] School systems, however, can bill Medicaid for medically necessary school-based services including physical therapy.[24] Of the 47 states and Washington, D.C. that have billing codes for school-based PT services, 92% of states used fee-for-service payment even if medical coverage was a managed care plan.[24] Fee-for-service systems may encourage use of billable practices,[25] which we hypothesize may occur in schools because IDEA does not fully fund special education services.[26] SBPTs may be encouraged to provide direct services in isolated settings or outside students' natural routines and activities so schools can bill for therapy services. Because we did not ask SBPTs about payment systems, we do not know the influence of payment systems or the pressures that SBPTs may experience to provide billable services.

Our third strongest variable that predicated the *gap* between estimated *ideal* and *actual* practice was SBPTs' district written contracts. Interestingly, when we analyzed the difference between therapists' employment status the *gap* between estimated *ideal* and *actual* practice did not differ between any of the employment groups. Therefore, although SBPTs' district written contracts predicted the *gap*, being a contracted or employed school personnel was not associated with the *gap* in practice.

Because administrators may lack understanding of the role of special education teachers,[27] they may similarly not fully understand SBPTs' practice nor how to write contracts that support embedding services. For example, administrators may write SBPTs' contracts that allow high workloads leading SBPTs to provide isolated group interventions rather than embedded individual services. However, we did not find a significant difference in the gap between *ideal* and *actual* practice when comparing high and low workloads (Table 4). Further research may elucidate any relationship between SBPTs' district written contracts and use of embedded services.

Our survey only queried contracted SBPTs regarding district written contracts. These questions included the largest amount of imputed data of all the questions. Thus, the variable contracts should be interpreted with caution.

Our fourth predictor was inferred families' preferences. The frequency of SBPTs who embedded services varied based on whether therapists reported families preferred embedded or isolated services. Specifically, more students received embedded services if their parents preferred services in regular education and fewer received embedded services if their parents preferred isolated services. Based on the results, SBPTs may take families' requests into consideration when making service decisions. Understanding parents' and students' goals and desires are important for SBPTs as they strive to improve students' outcomes. Families may prefer isolated settings, particularly those accustom to clinical services, or may not have considered contextual embedded services. As part of the IEP team, students, parents, and SBPTs should consult together to identify the context and location for effective service delivery. Although Thomason and Wilmarth[7] reported that parents' expectations for isolated therapy services were barriers to providing services in student's natural settings, parents' opinions may differ on the emphasis of therapy,[28] which could impact decisions regarding embedded services. While SBPTs may want to translate their knowledge of context-based, naturally occurring school-based therapy services to families, it will be important for SBPTs to acknowledge parents' preferences in service delivery.

Upon further analysis, we found regional differences in practice. SBPTs in the North region reported higher percentages of *gap* between estimated *ideal* and *actual* practice and fewer estimates of embedded *actual* practice compared with SBPTs in the North Central and South East regions. Similarly, Kaminker and colleagues[10] found that northeastern therapists recommended fewer embedded services than other regions. They also found an increased number of independently contracted SBPTs in the northeast and suggested that contracted SBPTs may struggle more than employed SBPTs to be enmeshed within school systems to embed services.[10] We hypothesize that regional differences may result from regional variance in the time students with disabilities spend in regular education classrooms, [29] SBPTs' state practice guidelines,[30] and potential student/therapist ratios[9]. States educating fewer students with disabilities in regular education classrooms may influence embedding services if isolated services are considered acceptable because students spend more time isolated in special education settings compared with general education settings. Further research is needed to determine how regional factors may influence education and SBPTs' practice.

Finally, we found differences in SBPTs' estimated *actual* practice and *gap* based on demographic characteristics. Both APTA and APPT members embed more therapy services compared with non-members. We hypothesize members have more accessible education opportunities such as journals, newsletters, and networking on current and best practices. Interestingly, compared with recent school-based practice surveys,[4, 7, 31] our survey had the largest sample of non-APTA members allowing for comparison to APTA members.

Future Research

Our study reveals relationships that could help develop a theory purporting why SBPTs do not provide services in students' natural environments at a level they consider ideal. However, we suggest a shift in research to determining predictors of actually embedding school-based services and on how embedding services may affect students' participation. Our study is the first to include variables of district written contracts and third-party billing which we suggest need continued evaluation and research. Further exploration of regions, and APTA and APPT membership may elucidate the influence of these variables on SBPTs' practice.

Limitations

Although we achieved our sample of over 400 participants, we excluded 36% of potential participants with incomplete surveys. Our survey was long, averaging 27 minutes to finish, which may have inhibited completion. Rather than asking families and teachers their preferences, we asked SBPTs to infer their preferences. Because SPBTs, as IEP team members, frequently collaborate with teachers and families, we think SBPTs have knowledge of teachers' and families' preferences for service delivery. While our model did not meet the assumptions of normality and homoscedasticity, our estimated regression coefficients and predictors are still unbiased due to our large sample size and central limit theory.[32] Lastly, we used respondent driven sampling[12] to obtain a representative sample of SBPTs. However, SBPTs may have invited SBPTs with similar opinions and experiences. These biases may limit the generalizability of our study.

CONCLUSION

Although the *gap* between estimated *ideal* and *actual* practice continues, our predictive model is the first to specify 4 variables (disability, billing, contract, and family preferences) that predict the difference between what SBPTs think and what they actually do in providing PT services embedded within students' natural routines and activities. Further, this study is the first to report the analysis of SBPTs' estimates of *actually* providing embedded services and the *gap* in providing embedded services based on specific school-based predictor variables (severity of students' disability, PT interventions, students' IEP goals, inferred family preference, inferred teacher preference, SBPTs' workload, ability to bill third party payors, and district written contracts) and APTA and APPT membership. Based on our results, further research is needed to explicate the influence of written contracts and billing practices in SBPTs' practice.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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At the time this study was conducted, Valerie Clevenger was a DSc at the University of Oklahoma Health Sciences Center, Oklahoma City, OK.

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Table 1.

Demographic Characteristics of SBPTs Participants

Characteristics	n (%)	Mean (SD)
Advanced degree		
Yes	161 (39.36)	
No	248 (60.64)	
Age		
23-30 years	20 (4.90)	
31-40 years	79 (19.36)	
41-50 years	127 (31.13)	
51-64 years	182 (44.61)	
APTA member		
Yes	237 (58.09)	
No	171 (42.91)	
APPT member		
Yes	223 (54.66)	
No	185 (45.34)	
Billing practices		
Yes	328 (80.79)	
No	78 (19.21)	
Employment status		
Contracted	114 (28.01)	
Employed	266 (65.36)	
Other	27 (6.63)	
Entry level degree		
BS	200 (48.90)	
MPT	117 (28.61)	
DPT	92 (22.49)	
Highest degree earned		
BS	104 (25.37)	
MPT	54 (13.17)	
DPT	194 (47.32)	
MS	50 (12.20)	
DSc	6 (1.46)	
ScD	0 (0)	
PhD	2 (0.49)	
Other	0 (0)	
Region		
I	33 (8.05)	
II	57 (13.90)	
III	93 (22.68)	
IV	101 (24.63)	

Characteristics	n (%)	Mean (SD)
V	51 (12.44)	
VI	27 (6.59)	
VII	48 (11.71)	
Work status		
Full time	325 (79.85)	
Part time	82 (20.15)	
Years as PT		
1-10 years	65 (16.01)	
11-20 years	94 (23.15)	
21-30 years	146 (35.96)	
31 or more years	101 (24.88)	
Years as SBPT		
1-10 years	136 (33.33)	
11-20 years	156 (38.24)	
21-30 years	92 (22.55)	
31 or more year	24 (5.88)	
Percent of Workload		
Pre-kindergarten		31.87 (26.48)
Elementary grades		42.06 (22.56)
Middle/Junior high grades		12.51 (12.13)
High school grades		10.52 (12.07)
Post high school/Transition		2.34 (6.72)

Abbreviations: APPT, Academy of Pediatric Physical Therapy; APTA, American Physical Therapy Association; BS, bachelor of Science; DPT, doctor of physical therapy; DSc, doctor of science; MPT, masters of physical therapy; MS, masters degree; PhD, doctor of philosophy; PT, physical therapist; SBPTs, school-based physical therapists; ScD, doctor of science; SD, standard deviation; %, percentage.

Regions: Region I: Alaska, California, Hawaii, Idaho, Montana, Nevada, Oregon, Utah, Washington; Region II: Colorado, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Wyoming; Region III: Illinois, Indiana, Michigan, Ohio, Wisconsin; Region IV: Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont; Region V: District of Columbia, Maryland, North Carolina, South Carolina, Virginia, West Virginia; Region VI: Alabama, Florida, Georgia, Kentucky, Mississippi, Puerto Rico, Tennessee; Region VII: Arkansas, Arizona, Louisiana, New Mexico, Oklahoma, Texas.

Table 2

Significant Predictor Model Variables

Variable	Parameter Estimate	Standard Error	t Value	P-value
Disability	−0.2258	.0507	−4.45	*<.0001*
Billing	−0.1459	.0426	−3.42	*0.007*
Contracts	−0.1391	.0430	−3.24	*0.001*
Family	−0.1280	.0417	−3.07	*0.002*
R2	.4718			
Adjusted R2	.4666			

Threshold for statistical significance set at $p \leq 0.05$ and determined by stepwise linear regression

Table 3

Comparison of Demographic Pairs/Categories Based on Ideal, Actual and Gap

Demographic Variable	Ideal		Actual		Gap	
	Mean (Median) [a]	p-value	Mean (Median) [a]	p-value	Mean (Median) [a]	p-value
Advanced degree [b]						
Yes	56.29		35.24		42.97	
No	45.93	*.0031*	30.80	.0939	45.45	.2154
APTA membership [b]						
Yes	55.59		36.44		44.61	
No	42.24	*.0002*	27.12	*.0026*	44.28	.4583
APPT membership [b]						
Yes	56.66		37.46		44.28	
No	41.96	*<.0001*	26.59	*.0005*	44.71	.4449
Billing practices [b]						
Yes	48.48		31.20		45.60	
No	56.59	*.0470*	38.34	*.0483*	39.68	*.0498*
Employment status [c]						
Contracted	45.99 (35.71)		27.78 (14.29)		48.58 (33.33)	
Employed	49.64 (47.62)		33.19 (19.05)		43.35 (47.62)	
Other	70.90 (95.24)	*.0055*	46.38 (38.10)	*.0246*	38.27 (28.57)	.1842
Entry Level Degree [d]						
BS	53.64		34.92		41.46	
MPT	49.41		32.36		46.03	
DPT	42.91	.0798	27.64	.2317	49.07	.1324
Part/Full Employ [b]						
Part-time	50.06		27.06		50.99	
Full-time	50.01	.4964	33.93	.0515	42.84	*.0236*
Regions [c]						
I	53.25 (52.38)		38.82 (23.81)		38.96 (28.57)	

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Demographic Variable	Ideal		Actual		Gap	
	Mean (Median) [a]	p-value	Mean (Median) [a]	p-value	Mean (Median) [a]	p-value
II	61.65 (76.19)		47.54 (52.38)		31.66 (28.57)	
III	44.60 (33.33)		23.35 (9.52)		49.87 (42.86)	
IV	41.87 (33.33)		20.18 (9.52)		57.10 (51.14)	
V	59.94 (66.67)		47.53 (42.86)		34.36 (23.81)	
VI	47.62 (47.62)		36.16 (23.81)		38.27 (33.33)	
VII	52.48 (52.38)	*.0089*	36.41 (16.67)	*<.0001*	40.67 (38.10)	*<.0001*
Years as PT [d]						
1-10 years	42.27		26.74		50.84 (57.14)	
11-20 years	45.74		27.46		50.05 (47.62)	
21-30 years	53.66		34.90		42.76 (38.10)	
>30 years	53.59	.1049	37.54	.0720	37.77 (33.33)	*.0139*
Years as SBPTs [c]						
1-10 years	45.45 (33.33)		28.92 (14.29)		49.58 (47.62)	
11-20 years	49.85 (47.62)		32.58 (19.05)		43.34 (38.10)	
21-30 years	55.49 (59.52)		35.66 (23.81)		41.25 (33.33)	
>30 years	56.15 (66.67)	.2992	41.07 (33.33)	.1893	35.32 (23.81)	.0916
Significant Pairs						
Employment status [e]						
Contract-Employed		.3124		.1452		N/S
Contract-Other		*.0035*		.0420		N/S
Employed-Other		*.0019*		*.0080*		N/S
Significant Pairs						
Regions [f]						
II-III		N/S		*<.0001*		*.0020*
II-IV		*.0011*		*<.0001*		*<.0001*
III-V		N/S		*.0004*		N/S
IV-V		N/S		*<.0001*		*<.0001*

Demographic Variable	Ideal		Actual		Gap	
	Mean (Median) [a]	p-value	Mean (Median) [a]	p-value	Mean (Median) [a]	p-value
Years as PT [g]						
11-20 years - 31+ years		N/S		N/S		*.0074*

Abbreviations: APPT, Academy of Pediatric Physical Therapy; APTA, American Physical Therapy Association; N/S, not significant; PT, physical therapist; SBPT, school-based physical therapist

[a]Median listed for non-parametric analysis only;

[b]Threshold for statistical significance set at 0.05 and determined by two sample t-test assuming unequal variances;

[c]Threshold for statistical significance set at 0.05 and determined by Kruskal-Wallis non-parametric test;

[d]Threshold for statistical significance set at 0.05 and determined by ANOVA;

[e]Threshold for statistical significance set at 0.0167 due to correction and determined by Wilcoxon Rank-Sum test;

[f]Threshold for statistical significance set 0.00238 due to correction and determined by Wilcoxon Rank-Sum test;

[g]Threshold for statistical significance set at 0.0083 due to correction and determined by Wilcoxon Rank-Sum test;

Table 4

School-Based Service Question Pair Comparisons

Demographic Variable	Ideal		Actual		Gap	
	Number [a]	p-value [b]	Number [a]	p-value	Number [a]	p-value
Billing						
Able to bill	213		126		193	
Unable to bill	220	.7314	127	.9577	195	.9219
Workload						
High	196		115		198	
Low	235	.0559	130	.4224	197	.9609
Contracts						
Direct only	208		111		225	
Not direct only	216	.6951	151	*.0357*	193	.1171
Disability						
Challenge						
More challenging	186		124		187	
Less challenging	222	.0780	141	.3735	179	.6936
Severity						
Mild	235		148		172	
Mild-Moderate	181		126		183	
Moderate	160		115		190	
Moderate-Severe	174		138		163	
Severe	205	*<.0001*	167	*<.0001*	141	*.0046*
Family Preferences						
Prefer isolated	142		82		179	
Prefer embedded	265	*<.0001*	190	*<.0001*	158	.2961
Goals						
Intervention based	149		97		180	
Participation based	307	*<.0001*	201	*<.0001*	167	.5194
Interventions						
More hands on	119		78		196	
Less hands on	240	*<.0001*	160	*<.0001*	173	.2577
Teacher Preferences						
Prefer isolated	168		97		189	
Prefer embedded	266	*<.0001*	179	*<.0001*	171	.3746

[a] Number/frequency of SBPTs who answered 80-100%;

[b] Threshold for statistical significance set at 0.05 and determined by chi-square