UNRAVELLING THE INFLUENCE OF MEDIATING FACTORS ON THE RELATIONSHIP BETWEEN KNOWLEDGE AND DIFFICULTY IN CLINICAL PRACTICES

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ABSTRACT

Background and Aims: This research aims to investigate the relationship between knowledge (K) and difficulty of clinical practices (DCP) while exploring the potential mediating factors of academic skills (AS), confidence (C), students' lack of interest (SLI), and teaching skills (TS). Clinical practices are vital for educating and training healthcare professionals, and understanding the factors contributing to difficulty during these practices is crucial for improving educational outcomes.

Methodology: The study adopted a quantitative technique, collecting data from a sample of healthcare students through surveys and assessments. Statistical analyses, including mediation analysis, were conducted to examine the relationships between the variables of interest.

Results: All four mediators significantly impacted the relationship between Knowledge and Difficulty in Clinical Practices.

Limitations: The study is limited to healthcare students. The sample size of the article is limited due to time constraints, and it is not necessarily important that only mentioned mediators cofound between AS and K.

Originality: The mediators significantly impact the originality of the article, which will generate a scholarly contribution to the community.

Conclusion: The implications of these findings suggest the need for educators and policymakers to focus on enhancing academic skills, fostering confidence, addressing students' lack of interest, and improving teaching practices.

Keywords: *Knowledge, academic skills, students' lack of interest, confidence, teaching skills, difficulty in clinical practices, experiential learning theory.*

Introduction

Understanding the implications of recent advancements and research on the knowledge-clinical practice link is essential to a deeper understanding of how knowledge (theoretical) and clinical practices (practical) are interrelated. The role of educators and their importance in bridging the practice-theory gap was the seclusion of Toufic's study[19]. He pointed out that educators are essential for helping students use their theoretical knowledge in practice and how it can help reduce the theory-practice gap [1]. Lack of time, Knowledge, confidence, skills and little formal training were the main obstacles which reduced patient outcomes in clinical practice.

This research assessed challenges in academic learning and clinical course between students. The space in the middle of theory and training was a significant detection. Practical orientation and conventional perspective of educators, students and therapists with regards to clinical capability based on practical skills that lower the demand for practice based on knowledge and research. Attempts to reduce the troubles between theory and practice in academic and clinical environments are essential to upgrade the training of student therapists. Also, education on professionalism and action based on the work environment may be helpful[2]. Physiotherapy Students' academic knowledge may increase due to the strategic plans of the unique characteristics of teaching styles. The learning styles can help students, and this improvising should be understood by the educators about their ways of teaching and learning simultaneously[3]. This study identified 107 competencies as a minimal requirement for clinical practice for physiotherapists working in UK critical care units. The results of this study need to be disseminated to assist training initiatives in higher education and the healthcare industry that will hopefully lessen variation in clinical practice[4].

Physiotherapy is concerned with the theoretical and clinical educational processes. Clinical practice is associated with the academic knowledge and clinical skills received in the learning environment. Moreover, according to Günay & Kılınç[5], clinical skills play a significant role in implementing theoretical knowledge into clinical practices.

This study shows that the quality of health and wellness programs largely depends upon a person's knowledge, skills, and attitude, and to enhance the knowledge and skills of therapists must continue with great vigor and regularly evaluated in clinical practice therapist should have good knowledge to understand the actual condition so that he can manage perfectly[6].

The need to comprehend the relationship between physical therapists' and occupational therapists' knowledge and their clinical practices in clinics, as well as the potential effects of mediators on this relationship, is the topic this study attempts to solve. Despite the significance of clinical practice and knowledge in physical therapy and occupational therapy, an in-depth study into the precise variables that influence the connection between knowledge and clinical practices is lacking. This study seeks to contribute to developing evidence-based methods to improve the standard of clinical practices[26] and optimize patient outcomes in physical therapy and occupational therapy settings by investigating these correlations and locating potential mediators. This study aims to assess the association of clinical practices of physical / occupational therapists in clinics in association with their knowledge. Another objective of this study is to find the effects of mediators between knowledge and clinical practices.

Rationale

Clinical practice experiences have a broad role for the students of rehabilitation. Their knowledge directly relates to what they will practice at clinics throughout their studies. However, rehab students need to know deep insight into clinical practices through their understanding. If it still needs to be done, it is essential to assess the mediators reflecting the knowledge and its impacts on clinical practices.

Conceptual Framework
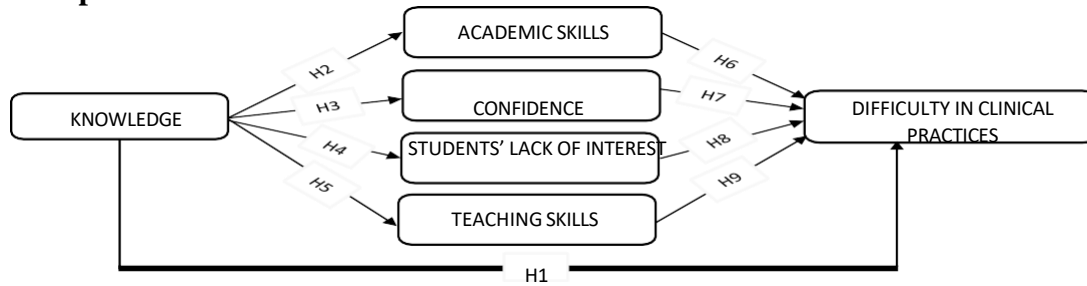
Figure 1: shows the conceptual framework of Knowledge, Academic Skills, Confidence, Students' Lack of Interest, Teaching Skills and Difficulty in Clinical Practices

H_0: There is no association between Knowledge and Difficulty in Clinical Practices.
H_1: There is an association between Knowledge and Difficulty in Clinical Practices.
H_2: There is an association between Knowledge and Academic Skills.
H_3: There is an association between Knowledge and Confidence.
H_4: There is an association between Knowledge and Students' Lack of Interest.
H_5: There is an association between Knowledge and Teaching Skills.
H_6: There is an association between Academic Skills and Difficulty in Clinical Practices.
H_7: There is an association between Confidence and Difficulty in Clinical Practices.
H_8: There is an association between Students' Lack of Interest and Difficulty in Clinical Practices.
H_9: There is an association between Teaching Skills and Difficulty in Clinical Practices.

Methodology

Study Setting
The study is conducted at Rehabilitation Colleges in all locations respectively.

Study Design
Cross-Sectional Study

Target Population
Students in 3rd year and onwards who have already done their clinical rotations.

Duration of Study
The duration of the study is 6 to 8 months after the approval of the synopsis.

Sampling Technique
A simple Random Sampling technique will be used in this study.

Inclusion Criteria
Students of 3rd, 4th and 5th year who have experienced clinical rotations.

Exclusion Criteria
1st and 2nd-year students who still need to do clinical rotations.

Data Collection Tool
The data of the study was collected through a self-administrated questionnaire. Total of 4 questions for each variable have been constructed and extracted from previous multiple studies. A total of 28 questions were included in the questionnaire based on two parts, i.e., demographics and variables.

Data Collection Procedure
Data was collected through online Google forms from the students of Rehabilitation College.

Data Analysis
Data was analyzed through Smart PLS. To test the demographics of the data, descriptive statistics will be used. Moreover, the validity and reliability of the data will be checked through discriminant validity and convergent validity. To check the association between the variables, path coefficient test will be used.

Public Health Significance
The study will help the society to get awareness regarding the difficulties faced by students during their clinical practices. The study will explore the mediating components of knowledge and clinical practices.

Results

Descriptive Statistics

Construct	Frequency	Percentage Frequency
Gender		
Male	30	11.5%
Female	230	88.5%
Age		
18 – 20	12	4.6%
21- 23	212	81.5%
24 – 26	34	13.07%
27 & above	2	0.76%
Occupation		
Physical Therapy	235	90.3%
Occupational Therapy	25	9.61%

Table 1: shows the demographics of the data.

The table shows the descriptive statistics of a sample population based on gender, age, and occupation. The sample size is 260 individuals, with 30 (11.5%) male and 230 (88.5%) female. In terms of age, 12 (4.6%) individuals are between the ages of 18 and 20, 212 (81.5%) are between the ages of 21 and 23, 34 (13.07%) are between the ages of 24 and 26, and only 2 (0.76%) are 27 and above. Regarding occupation, 235 (90.3%) individuals are in physical therapy, while 25 (9.61%) are in occupational therapy. These descriptive statistics provide an overview of the sample population and can be used to gain insights into the characteristics of the population under study.

Measurement and Model Assessment
The data taken from the respondents of Rehabilitation Students have been tested through multiple tests by the PLS model. Smart PLS have been used to assess the data and test the model's adequacy.

Discriminate and Convergent Validity
The reliability of outer items has been tested through external loadings. According to Henseler, J., Ringle, C. M., & Sinkovics R. R[7], the value of outer loadings should be greater than 0.70 to consider them consistent. In this model, 27 items were concluded to have 0.70 or greater loading. This measurement tests the degree between two measures or constructs which should be theoretically related. The AVE values should be greater than 0.50 to achieve convergent validity. The value of Cronbach Alpha and Composite Reliability should be greater than 0.70[8], but not greater than 0.90 because it would be measured as the same construct.

Factor Loadings, Cronbach's Alpha, CR and AVE					
Constructs		**Loadings**	**Cronbach's Alpha**	**CR**	**AVE**
AS	AS1	0.743	0.835	0.861	0.687
	AS2	0.758			
	AS3	0.864			
	AS4	0.715			
	AS5	0.914			
	AS6	0.939			
	AS7	0.953			
CON	CON1	0.815	0.843	0.865	0.619
	CON2	0.788			
	CON3	0.721			
	CON4	0.678			
	CON5	0.909			
DCP	DCP1	0.919	0.745	0.790	0.625
	DCP2	0.786			
	DCP3	0.850			
K	K1	0.768	0.841	0.846	0.677
	K2	0.853			
	K3	0.804			
	K4	0.864			
SLI	SLI1	0.695	0.854	0.877	0.582
	SLI2	0.793			
	SLI3	0.682			
	SLI4	0.911			
	SLI5	0.790			
TS	TS1	0.908	0.735	0.776	0.656
	TS2	0.692			
	TS3	0.815			

Table 2: shows the Factor Loadings, Cornbach's Alpha,CR & AVE of the data sample size. K= Knowledge, DCP= Difficulty in Clinical Practices, AS= Academic Skills, C= Confidence, SLI= Students' Lack of Interest, TS= Teaching Skills.

Internal Consistency

Internal consistency evaluates the reliability of constructs. According to Hasan et al.[9], composite reliability and Cronbach alpha should be greater than 0.70 and less than 0.90. The above table shows that composite reliability and Cronbach alpha values lie between 0.70 and 0.90, indicating that the measure of the construct is valid. Convergent validity: The convergent validity model is used to observe the degree of inter-relationship between the underlying constructs. The average variance extracted (AVE) was proposed by Fornell and Larcker[10], which states that AVE should be greater than 0.50. Table 2 shows AVE of each construct has achieved the suggested criteria. Discriminant validity: Discriminant validity test analyses relationships between latent variables. According to Moor et al.[11], results less than 0.85 indicate that discriminant validity exists, and greater than 0.85 suggests that the two constructs greatly overlap. The Fornell and Larcker criterion of AVE value should be greater than 0.50. Although, composite reliability and Cronbach alpha should exceed 0.70. Also, each loading should be higher than 0.70 so that this measurement model analyzes the relationship between latent variables and their measures.

Fornell and Larcker Criterion

Moreover, according to Fornell et al.[10], the square root of AVE should be more than the collinearity of other constructs to achieve discriminant validity. The above shows the variance among all the latent variables in this study.

Fornell and Larcker Criterion						
	AS	CON	DCP	K	SLI	TS
AS	**0.826**					
CON	0.463	**0.786**				
DCP	0.420	0.675	**0.778**			
K	0.481	0.546	0.756	**0.823**		
SLI	0.414	0.537	0.651	0.800	**0.763**	
TS	0.425	0.512	0.533	0.704	0.702	**0.810**

Table 3: shows the Fornell and Larcker Criterion of the variables. K = Knowledge, DCP = Difficulty in Clinical Practices, AS = Academic Skills, C = Confidence, SLI = Students' Lack of Interest, TS = Teaching Skills.

Cross Loadings and Outer VIF Measurement Model

To judge the discriminant validity, cross loadings are used to interpret the data. It interprets the associations of factor loading of one construct to another.

Cross Loadings						
	AS	CON	DCP	K	SLI	TS
AS1	**0.742**	0.458	0.403	0.464	0.409	0.425
AS3	**0.758**	0.360	0.323	0.371	0.341	0.330
AS4	**0.864**	0.334	0.348	0.366	0.290	0.328
AS5	**0.526**	0.293	0.200	0.282	0.255	0.233
AS6	**0.914**	0.391	0.378	0.415	0.355	0.370
AS7	**0.939**	0.402	0.373	0.423	0.349	0.371
AS8	**0.953**	0.399	0.351	0.413	0.358	0.355
CON1	0.492	**0.815**	0.479	0.768	0.698	0.570
CON3	0.470	**0.788**	0.772	0.453	0.769	0.134
CON5	0.244	**0.721**	0.360	0.691	0.644	0.457
CON6	0.237	**0.878**	0.436	0.537	0.691	0.519
CON7	0.313	**0.909**	0.512	0.554	0.432	0.630
DCP2	0.449	0.659	**0.919**	0.712	0.641	0.756
DCP4	0.259	0.272	**0.678**	0.344	0.232	0.529
DCP5	0.253	0.567	**0.850**	0.641	0.559	0.650
K2	0.492	0.114	0.479	**0.768**	0.698	0.570
K4	0.470	0.788	0.772	**0.853**	0.769	0.687
K6	0.221	0.720	0.668	**0.804**	0.741	0.654
K7	0.397	0.796	0.539	**0.864**	0.751	0.649
SLI1	0.447	0.766	0.410	0.714	**0.800**	0.525
SLI3	0.460	0.670	0.788	0.513	**0.793**	0.554
SLI5	0.194	0.624	0.206	0.587	**0.682**	0.374
SLI6	0.231	0.632	0.417	0.493	**0.678**	0.462
SLI7	0.283	0.740	0.408	0.727	**0.911**	0.555
SLI8	0.195	0.629	0.560	0.690	**0.790**	0.706
TS2	0.470	0.788	0.772	0.853	0.769	**0.908**
TS4	0.341	0.398	0.567	0.479	0.368	**0.692**
TS5	0.221	0.720	0.668	0.804	0.741	**0.815**

Table 4: shows the Cross Loadings of the variables. K = Knowledge, DCP = Difficulty in Clinical Practices, AS = Academic Skills, C = Confidence, SLI = Students' Lack of Interest, TS = Teaching Skills.

The evaluation of cross-loadings is a common technique for establishing discriminant validity. Researchers constantly analyze indicator loading patterns to recognize evidence that they possess high loadings on identical factors and those that load highly on other factors[12]. The result in Table 4 indicates apparent that researchers accomplished discriminant validity as it means that the factor loading of an associated contrast is greater than the factor loading on another difference.

Moreover, VIF is used to check the collinearity. The values of VIF should be less than 5 to prove the collinearity between the indicators[24].

VIF	
AS1	1.130
AS3	1.217
AS4	1.178
AS5	1.654
AS6	1.780
AS7	1.554
AS8	1.455
CON1	1.356
CON3	1.822
CON5	1.221
CON6	1.212
CON7	3.321
DCP2	2.088
DCP4	1.112
DCP5	1.935
K2	3.206
K4	2.864
K6	3.870
K7	4.108
SLI1	1.422
SLI3	3.321
SLI5	2.460
SLI6	1.312
SLI7	3.541
SLI8	2.421
TS2	2.049
TS4	1.415
TS5	3.590

Table 5: shows the Variance Inflation Factor of the variables. K = Knowledge, DCP = Difficulty in Clinical Practices, AS = Academic Skills, C = Confidence, SLI = Students' Lack of Interest, TS = Teaching Skills.

Variance inflation factor (VIF) determines that the estimated regression coefficient is present if the variance is inflated in the correlation of the independent variables[13]. Furthermore, IF is used to check collinearity. The VIF values should be lesser than 5 to prove the collinearity among indicators. Mention table shows that values are less than 5, proving that the collinearity is absent among indicators[24].

Path Coefficient and Specific Indirect Effects

Summary of Hypothesis Testing Results					
Hypothesis	Path Coefficient	Standard Error	T - Value	P - Value	Study Results
H1: K ---> DCP	-0.72	0.038	2.578	0.023	Supported
H2: K ---> AS	0.67	0.218	5.67	0.0002	Supported
H3: K ---> C	0.81	0.046	5.43	0.01	Supported
H4: K ---> SLI	-0.75	0.007	10.41	0.0001	Supported
H5: K ---> TS	0.66	0.04	0.453	0.453	Not Supported
H6: AS ---> DCP	-0.53	0.011	6.75	0.0001	Supported
H7: C ---> DCP	-0.75	0.225	3.54	0.0011	Supported
H8: SLI ---> DCP	0.66	0.076	4.66	0.0001	Supported
H9: TS ---> DCP	-0.54	0.014	6.78	0.0001	Supported

Table 6: shows the Path Coefficient and Specific Indirect Effects among the variables. K = Knowledge, DCP = Difficulty in Clinical Practices, AS = Academic Skills, C = Confidence, SLI = Students' Lack of Interest, TS = Teaching Skills.

The above study distinctly shows that the Coefficient of the interval has brought off the desired results following our hypothesis testing; knowledge has a significant negative effect on clinical

practice (Co-eff: 0.72, P value: 0.023, T value: 2.578), while knowledge also has a significant positive impact on academic skills (Co-eff: 0.67, P value: 0.0002, T value: 5.67). Knowledge has very strong positive relationship with confidence (Co-eff: 0.81, P value: 0.01, T value: 5.43). Furthermore, knowledge significantly negatively affects skills (Co-eff: 0.75, P value: 0.0001, T value: 10.41). The hypothesis of the relation between knowledge and teaching skills has been rejected because the value of P is more than 0.1 (P value: 0.453), and T value is less than 2.5 (T value: 0.453), and the value of the Coefficient is 0.66, which is positive, whereas academic skills have a significant negative effect on clinical practice (Co-eff: 0.53, P value: 0.0001, T value: 6.75). Confidence has a significant relationship with Clinical Practice, which is negative (Co-eff: 0.75, P value: 0.0011, T value: 3.54), and clinical practice has significantly affected the skills of a clinician, and the relationship is positive (Co-eff: 0.66, P value: 0.0001, T value: 4.66). Teaching skills significantly negatively impact clinical practice (C0-eff: 0.54, P value: 0.0001, T value: 6.78).

Model Quality Assessments
Standardized Root Mean Square Residual (SRMR)
According to Shiu et al., [14], the SRMR is used to check the quality of the model in which the value should be less than 0.10. In this study, the value of SRMR was found to be 0.093, which is estimated to be a good fit.

	Saturated model	Estimated model
SRMR	0.091	0.10

Table 7: measures the Model Quality Assessments
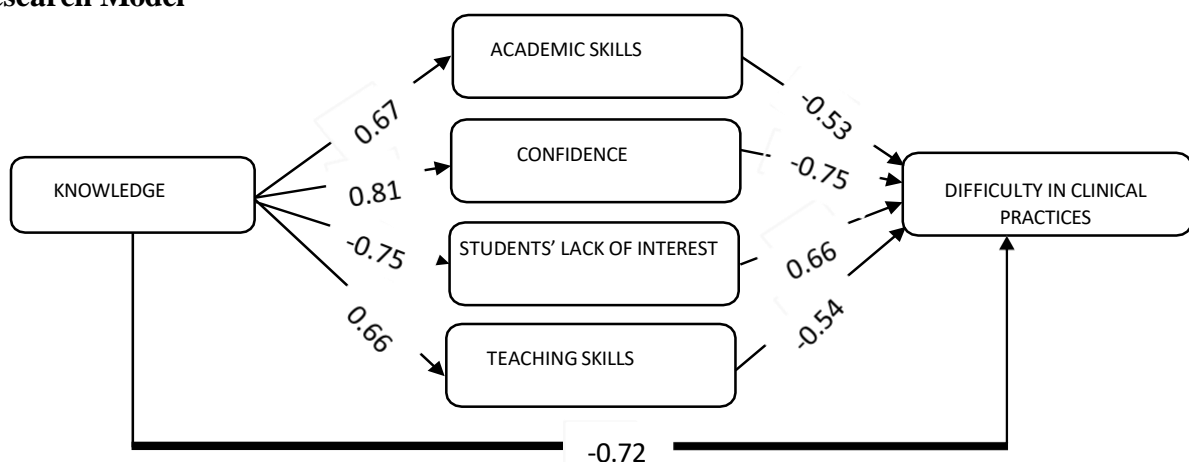
Research Model

Figure 2: shows the correlations of the variables in the model form

Discussion

The results shed important light on the nuanced connection between knowledge and the complexity of clinical practises. First, it's crucial to understand that pupils' difficulty level is not just determined by their expertise[15]. Our research uncovered some mediators that significantly impacted how knowledge and difficulty related to one another. The capacity of students to apply their theoretical knowledge in real-world settings emerged as a critical mediator, indicating that this ability had a considerable impact on the degree of difficulty encountered during clinical practises. Strong academic skills enabled students to transmit their information more successfully, allowing them to overcome the challenges presented in real-world healthcare circumstances. A study conducted by Alsaban concluded that sometimes students' lack of interest might lead to poor knowledge[16].

A key mediator in the link between knowledge and difficulty, confidence also played an important part. Students who felt confident in their skills generally went into clinical settings with a more upbeat attitude, which enhanced motivation and resilience in the face of challenges[17]. However, even if they have the necessary knowledge, students who need more confidence may find the clinical practice more complex, which could negatively affect their performance as a whole [18.]

The lack of interest among students was another essential factor in our study. Lack of interest can result from many factors, such as a mismatch between individual career goals and the healthcare profession of choice or disconnect between academic knowledge and its practical application in clinical settings. Lack of interest on the part of students may make it harder for them to participate entirely in clinical practices, making their whole experience more challenging.

Additionally, it became clear that teaching abilities were a crucial mediating factor in the association between clinical practice difficulty and knowledge. Effective teaching methods can improve students' information retention and application, leading to better performance in clinical settings. On the other hand, effective teaching strategies may make it easier for students to connect theory and practice, hence raising the perceived complexity of clinical experiences.

Conclusion

This study emphasizes the significance of considering mediators when analyzing the association between clinical practice difficulties and knowledge. Academic skills, confidence, lack of interest, and teaching skills significantly impacted students' struggles during clinical practice. By addressing these mediators, educators and policymakers can lessen students' difficulties, enhancing their educational opportunities and general clinical performance.

Limitations and Future Implications

The study is only focused on the students related to allied healthcare workers, and it could also be extended to other healthcare workers[21]. The sample size of the study is limited due to time constraints. The study can be assessed in a longitudinal manner[22]. Moreover, the mentioned mediators are limited to the developed model and adapting only these variables does not accurately define the model's causality and directionality. More mediators can be tested in Study[23].

AUTHORS' CONTRIBUTION:
Conception or Design: Prof. Dr. Fatma A. Hegazy
Acquisition, Analysis or Interpretation of Data: Prof. Dr. Fatma A. Hegazy
Manuscript Writing & Approval: Prof. Dr. Fatma A. Hegazy
The author acknowledge his/her accountability for all facets of the research, ensuring that any concerns regarding the accuracy or integrity of the work are duly investigated and resolved.

INFORMED CONSENT: The informed consent was not applied

CONFLICT OF INTEREST: The authors have no conflict of interest.

ETHICS STATEMENTS: Each respondent of the study is informed through a consent form added in the starting of the questionnaire. It was ensured that all the collected information will keep enclosed and it will be only used for this study purpose.

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