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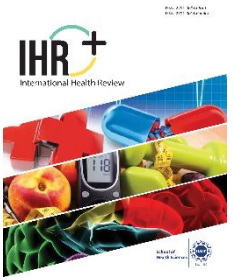

Title: **A Comparative Study to Analyze the Perspectives, Interests, and Barriers Towards Research Project Among Undergraduate Students in The Universities of Faisalabad**

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A Comparative Study to Analyze the Perspectives, Interests, and Barriers Towards Research Project Among Undergraduate Students in The Universities of Faisalabad

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ABSTRACT

Research plays a vital role in evaluating a nation's scientific progress, especially in the field of medical science. The purpose of the study was to analyze and compare the perspectives, interests, and barriers encountered by undergraduate students in Physical Therapy and Human Nutrition and Dietetics concerning research. It was a cross-sectional study. Study settings included GCUF, UAF and TUF. The study was conducted from September 2019 to February 2020. 148 participants were recruited according to the defined selection criteria. Employing a simple random sampling methodology, data was gathered exclusively from final-year undergraduate students pursuing DPT and HND, using a modified questionnaire. From 148 students (66 HND, 82 DPT), 38.5% of participants acknowledged the constructive and beneficial nature of research. Additionally, 36.49% strongly expressed their desire to delve into the intricacies of research. The Chi-square test demonstrated no statistically significant differences in perspectives, interests, and barriers toward research projects between HND and DPT students ($p>0.05$). The students' perspectives and interests in research were predominantly positive, reflecting their enthusiasm and curiosity. However, they also faced notable barriers and challenges including inadequate time and monetary support, insufficient training for research, and lack of supervision that hindered their engagement in research projects.

Keywords: barriers, interests, perspectives, research, undergraduate

1. INTRODUCTION

Research is critical in determining a country's scientific development, particularly in medical research, where it serves as the foundation for technological and medical progress [1]. The effectiveness of physical

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therapy relies on rigorous scientific investigation, which not only enhances researchers' knowledge and expertise but it also guarantees the overall well-being and good care of patients [2]. Consequently, physical therapy practitioners necessitate evidence-based clinical decision-making and the seamless integration of current research findings into their practice [3]. Thus, engaging in research projects mandates comprehensive comprehension, honed research skills, and adequate training, which is essentially important for conducting research-based projects [4]. Remarkably, a significant majority of registered dietitians believe that the undergraduate educational system does not effectively impart research competencies [5]. Medical students typically display a favorable interest in participating in research practice. However, they often face various obstacles that limit their active involvement in research projects [6]. Notable obstacles encompass limited time availability, insufficient funding, a dearth of supervisors, inadequate research training courses, and restricted access to comprehensive databases [7]. Despite the current research curriculum, which necessitates research as a leading factor in any field; these obstacles continue to persist, underscoring the crucial necessity for revisions in the medical curriculum. Focusing on research methodology is particularly important to empower medical students with enhanced research capabilities [8]. Regional variations are evident in students' perceptions regarding these barriers, with students in developing countries experiencing more challenges at the undergraduate level as compared to their counterparts in the developed countries [9].

A study led by S. Pallamparthy et al. explored research knowledge, attitudes, and barriers among medical undergraduates. The findings indicated good knowledge levels and positive attitudes toward research, emphasizing the importance of integrating it into the curriculum. However, barriers, such as limited awareness, lack of interest, financial constraints, time limitations, and challenges with patient follow-up were identified [10]. Undergraduate medical students in Pakistan face various challenges similar to those in other developing countries, which discourage their involvement in research activities [11]. Notably, these students have negative attitudes toward research method courses, which is an impelling force for their future career success [12]. Moreover, there are gender differences, with female students expressing higher levels of anxiety towards research as compared to their male counterparts. Despite these obstacles, ongoing efforts are being made to strengthen research skills and training at both undergraduate and

postgraduate levels, to improve the state of healthcare research in Pakistan [13]. A cross-sectional study conducted in Riyadh by Basudan et al. [14] examined attitudes and barriers faced by dentists in National Guard Health Affairs regarding research. For this purpose, the data was collected from 128 participants, with 32% female and 68% male, by using a self-administered questionnaire that was divided into three parts: demographic details, attitudes toward research, and barriers encountered throughout their academic tenure. The results revealed; predominantly positive attitudes toward research, with 96.9% believing that it enhances knowledge and 93.8% perceiving that it has improved career opportunities. Key barriers reported in this study, included insufficient support from funding agencies, inadequate documentation and record-keeping, and limited technical and administrative research support.

This study addresses a critical literature gap by examining and contrasting the viewpoints, interests, and obstacles faced by undergraduate students pursuing Physical Therapy and Human Nutrition and Dietetics (HND) programs with regard to research projects. While there is existing research on undergraduate research experiences, there is a lack of specific investigation that compares these two distinct fields in terms of research. Thus, understanding the unique perspectives, interests, and barriers in these disciplines is vital for developing targeted interventions and tailored curricula to enhance research engagement and academic growth among students. Therefore, this study aimed to analyze and compare the perspectives, interests, and barriers encountered by undergraduate students in Physical Therapy, and Human Nutrition, and Dietetics concerning research projects. The selection of Human Nutrition and Dietetics (HND) and Doctor of Physical Therapy (DPT) students for comparison in the study was based on their relevance to the research topics and the availability of participants within these programs. These groups were chosen because they represent students pursuing healthcare-related degrees, making their perspectives on research particularly relevant to this study. The findings will contribute to the broader understanding of the importance of research education and its implications for professional development in these fields, ultimately facilitating evidence-based practice and fostering a culture of research within these domains.

2. MATERIAL AND METHODS

It was a cross-sectional study. A simple random sampling technique was used to gather data from 148 final-year undergraduate students enrolled in Physical Therapy (DPT) and Human Nutrition and Dietetics (HND) programs from Government College University Faisalabad (GCUF), University of Agriculture Faisalabad (UAF), and The University of Faisalabad (TUF). The sample size was calculated through Open Epitool software. The study specifically focused on undergraduate students, excluding individuals with isolated personalities, unwillingness to participate in research and psychological issues. The duration of the study was 6 months from September 2019 to February 2020.

To gather information on the perspectives, interests, and barriers experienced by final-year DPT and HND students, a modified questionnaire was utilized, which underwent several revisions under the guidance of 2 to 3 experts from the Department of Physical Therapy and a statistician from GCUF. Although a pilot study was not conducted, the questionnaire's reliability and validity were ensured through expert review and statistical assessment. These, experts reviewed the questionnaire for content validity, and statistical analysis demonstrated high internal consistency. This comprehensive approach strengthens the questionnaire's credibility for the study. The student's opinions were measured using a Likert scale. Before the data collection, all participants were duly briefed on the study's purpose and significance. Under the defined inclusion and exclusion criteria, study subjects were recruited using a simple random sampling technique. Consent forms were obtained from all participants to ensure their agreement to take part in the study. An online questionnaire was also generated and forwarded to students through emails; however, the response rate was disappointingly low, with only a limited number of students providing their input through the online platform. This discrepancy may be attributed to potential technical issues and participant preferences. Although this may introduce some bias into the findings, measures were taken to ensure the security and confidentiality of online responses. The majority of the data was acquired through personal and direct administration of questionnaires, fostering a more engaging and interactive approach to data collection. This method involved in-person interactions with the undergraduate students, enabling a deeper level of engagement, enhanced comprehension, and the opportunity for immediate clarification and feedback.

2.1. Statistical Analysis

The collected data was thoroughly analyzed using the SPSS version 22 software. Frequency distribution was employed to explore the perspectives, interests, and barriers expressed by the students, while the Chi-Square test was utilized to compare these factors between final-year DPT and HND students.

3. RESULTS

3.1. Descriptive Statistics

The demographic statistics provided valuable insights into the student population, as shown in Figure 1. A small percentage (3.3%) of students was between 18-20 years, while the majority (81.08%) fell within the range of 21-23 years. A smaller group (15.5%) consisted of students aged 24-26 years. In terms of gender distribution, Figure 2 revealed that 28.37% of the students were male, while the majorities (71.6%) were female. Additionally, 67% students were from DPT and 44% of students were from HND; from Government College University Faisalabad, 41%students of HND were from University of agriculture Faisalabad, 12% students of DPT, and 15% students of HND were from The University of Faisalabad (Figure 3).

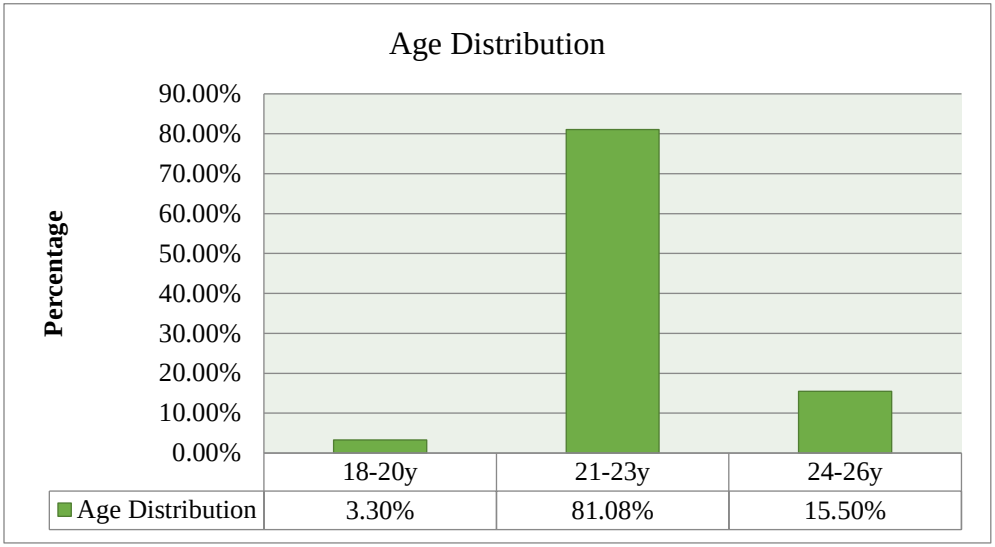

Figure1. Age of Participants

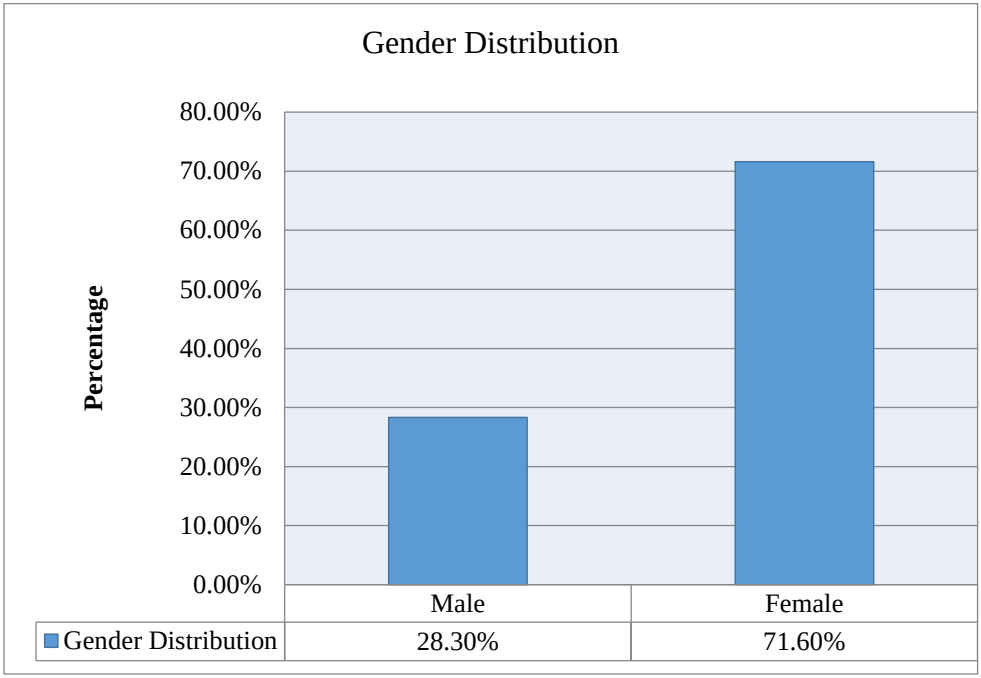

Figure 2. Gender of Participants

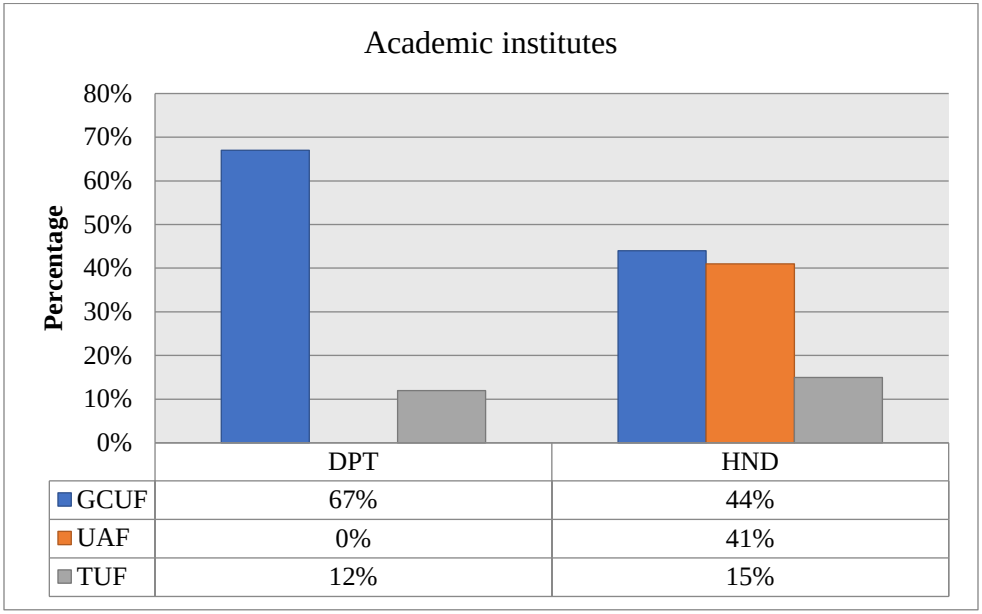

Figure 3. Academic Institutes of Participants

3.2. Participant's Perspective, Interest, and Barriers

The survey collected responses from 148 students (66 HND, 82 DPT). A majority (50.68%) agreed on the shared thought that research is complex, while 47.98% saw its value in enhancing knowledge. Nearly half (46.62%) were concerned about their mistakes and 44.59% recognized the professional benefits of research. As for its use in their profession, only 44.59% agreed to its implementation. Future benefits of research skills were seen by 39.19% (strongly agreed) and 46.62% (agreed), respectively. Furthermore, 36.49% of students expressed a strong interest in understanding research. While 20.27% strongly agreed and 43.24% agreed that research could be a career due to its interest, while only 18.92% were neutral. Interestingly, 41.22% saw clinical practice as superior to research. A significant 14.19% strongly agreed on insufficient research training. About time limitations, 37.16% agreed, 20.95% were neutral, and 24.32% disagreed. Lack of financial support was strongly confirmed by 12.84%, and half of the students agreed on insufficient/inadequate supervisor support. Lastly, 8.78% strongly agreed on limited database access, in which 35.81% were neutral and 14.19% disagreed (Table 1).

Table 1: Frequency and Percentages of Participant's Perspective, Interest and Barriers

Questions	Strongly agree *f*(%)	Agree *f*(%)	Neutral *f*(%)	Disagree *f*(%)	Strongly Disagree *f*(%)
Perspectives					
Research conductance is a complex process.	49(33.10%)	75(50.68%)	19(12.84%)	5(3.38%)	0(0%)
Research project is essential to enhance knowledge.	71(47.98%)	68(45.95%)	5(3.38%)	1(0.68%)	3(2.03%)
Afraid of making several mistakes while conducting research.	34(22.98%)	69(46.62%)	28(18.92%)	13(8.78%)	4(2.70%)
Research is advantageous and expedient for my profession.	66(44.59%)	67(49.78%)	11(7.43%)	2(1.35%)	2(1.35%)
Research is disturbing and challenging.	36(24.32%)	56(37.84%)	32(21.62%)	22(14.8%)	2(1.35%)

Questions	Strongly agree *f*(%)	Agree *f*(%)	Neutral *f*(%)	Disagree *f*(%)	Strongly Disagree *f*(%)
Interests					
I think clinical practice is superior to research.	61(41.22%)	58(39.19%)	20(13.51%)	7(4.73%)	2(1.35%)
I will implement research strategies in my profession.	47(31.76%)	66(44.59%)	32(21.62%)	1(0.68%)	2(1.35%)
Skills accomplished by research practice will be beneficial for me in future.	58(39.19%)	69(46.62%)	14(9.46%)	4(2.70%)	3(2.03%)
I would like to learn the details of research.	54(36.49%)	66(44.59%)	20(13.51%)	6(4.05%)	2(1.35%)
I want research as my career because it is interesting.	30(20.27%)	64(43.24%)	28(18.92%)	18(12.1%)	8(5.41%)
Barriers					
Insufficient training of students regarding to research	21(14.19%)	55(37.16%)	22(14.86%)	37(25.0%)	13(8.78%)
Time period is not enough for the completion of research	13(8.78%)	55(37.16%)	31(20.95%)	36(24.3%)	13(8.78%)
Insufficient monetary support for research project.	19(12.84%)	53(35.81%)	38(25.68%)	28(18.9%)	10(6.76%)
Lack of supervision	27(18.24%)	74(50.0%)	32(21.62%)	10(6.76%)	5(3.38%)
Databases are not easily accessible.	13(8.78%)	43(29.05%)	53(35.81%)	21(14.1%)	17(11.49%)

3.3. Perspectives, Interests, and Barriers Index score

The index scores for perspectives, interests, and barriers were computed based on the responses to 15 questions, which were a part of the questionnaire. For each participant, the percentage of responses for each set of 5 questions related to perspectives, interests, and barriers was determined. These percentages were then categorized into specific index scores.

The perspectives index score was classified as Good (0 to 50), Better (51 to 70), and Poor (71 to 100), along with the interests index score was categorized as Good (0 to 50), Better (51 to 70), and Poor (71 to 100), which were later used to evaluate the students' outlook and engagement. The

barriers index score was categorized as Very High (<1), High (1 to 30), Moderate (31 to 60), and Low (61-100), assessed based on the obstacles they encountered. By employing a chi-square test, the perspectives, interests, and barriers of HND and DPT students were compared. The results indicated no statistically significant disparities in their perspectives, interests, and barriers concerning research projects (Table 2).

Table 2. Chi-Square Test for Research Perspectives, Interests, and Barriers

Groups (*N*=148)	Perspectives			$X^2(df)$	*p*-value
	Good	Better	Poor		
HND (*n*=66)	34	20	12	0.04 (2)	0.97
DPT (*n*=82)	42	26	14		
Groups (*N*=148)	Interest			$X^2(df)$	*p*-value
	Good	Better	Poor		
HND (*n*=66)	42	14	10	0.98 (2)	0.61
DPT (*n*=82)	51	22	9		
Groups (*N*=148)	Barriers				$X^2(df)$	*p*-value
	Very High	High	Moderate	Low		
HND (*n*=66)	42	22	2	0	0.30 (2)	0.86
DPT (*n*=82)	55	24	3	0		

4. DISCUSSION

Research plays a vital role in improving and enhancing community healthcare services [15]. Health-related research plays a crucial role in contemporary undergraduate medical education [16]. Demographically, female participation predominated with a 71.62% prevalence rate, while males had a prevalence rate of 28.37%, respectively.

The majority of students exhibited a positive attitude towards the research and research projects. Out of 148 participants, 76 students fell into the "good" score category, while an additional 46 students fell into the "better" score category on the perspective index. The findings of a study conducted by Dina El Achi et al. echoed the outcomes of the recent investigation, affirming that students held optimistic perceptions concerning medical research and demonstrated an astute awareness of its intrinsic value. Notably, the average perception score, evaluated on a comprehensive scale ranging from 1-5, stood at an impressive rate of 4.35,

respectively [17]. In contrast, the findings of a study conducted by VG Chellaiyan et al. presented a different perspective. He conducted his study with a larger sample size of 344 participants, in which only a meager 19.8% displayed a positive attitude toward medical research [18].

A significant portion (36.49%) of students displayed a strong interest in pursuing research endeavors. When considering research as a career, a substantial number (63.43%); either strongly agreed or disagreed, while 18.92% were neutral. In line with the findings of this research, a study by Bassam AlRajhi et al. elucidated that 79.8% of students acknowledged the significance of research in identifying and investigating subject matter-related issues, while an encouraging 63.6% demonstrated a positive interest in getting engage in research related activities at the undergraduate level [19].

Notably, a considerable proportion of 44.59% of students affirmed their commitment to incorporating research strategies into their chosen profession. Within this cohort, 39.19% displayed a strong inclination, while an additional 46.62% agreed on the potential benefits of research skills for their future pursuits. In a likewise manner, a study conducted by Sobczuk et al. [20] yielded similar results. The research indicated that 55.2% of respondents expressed a high level of scientific interest, with no significant difference ($p>0.05$) observed between 2nd and 5th-year students. Furthermore, 33.8% of students expressed intentions to engage in research activities following graduation, while an impressive 52.8% planned to pursue a PhD degree in the future.

The study findings indicated that significant barriers, including inadequate supervision (reported by 50% of students), insufficient training in research methodologies (37%), and inadequate financial support (35%), impede students' involvement in research endeavors. Additional obstacles involve a limited timeframe for research completion and challenges associated with accessing and evaluating databases. A corroborative study by J. Kumar et al. further highlighted that a staggering 90.68% of students considered the lack of knowledge as a primary barrier. The second most prevalent barrier reported by students was a scarcity of time, with 88.79%, respectively acknowledging its impact, followed by a lack of mentoring, identified by 85.74% of participants [9].

4.1. Conclusion

The study findings revealed no statistically significant differences in perspectives, interests, and barriers toward research projects between Human Nutrition and Dietetics (HND) and Doctor of Physical Therapy (DPT) students, as indicated by a p-value exceeding the threshold of 0.05. Both groups of students demonstrated predominantly positive perspectives and interests, highlighting their keenness and curiosity regarding research endeavors. Nonetheless, they encountered notable barriers and challenges that impeded their engagement in research projects. These challenges encompassed constraints, such as inadequate periods, insufficient financial support, limited research training, and a lack of supervision.

This research contributes to an improved understanding of student perspectives and challenges within research education. It underscores the necessity for tailored support and resource allocation to encourage greater student engagement in research. Addressing these barriers and implementing comprehensive research training programs, as well as mentoring initiatives, becomes imperative for nurturing the research potential of students in these disciplines. This study lays the foundation for future research in the field of research education, providing valuable insights into the experiences of HND and DPT students.

4.2. Ethical Consideration

Throughout the study, ethical considerations were strictly adhered to, ensuring the rights and well-being of the participants. A permission letter signed by the Head of department was used to get permission of data collection from the universities. Clear communication regarding the study's procedure, significance, and purpose was provided to all participants. Participants were informed about their right to withdraw from the study at any point without repercussions. To protect their privacy, all data collected was anonymized, and any identifying information was removed during the analysis phase. The study received ethical approval from institutional review board of the “Government College University Faisalabad”.

4.3. Limitations

- Firstly, the small sample size, primarily attributed to the restricted time duration, limits the generalizability of the findings.

- Secondly, the inclusion of only two departments, namely Doctor of Physical Therapy (DPT) and Human Nutrition and Dietetics (HND), may not adequately represent the broader student population, reducing the external validity of the results.
- Additionally, the reliance on self-reported data introduces the possibility of response bias and subjectivity, potentially affecting the accuracy and reliability of the collected information.

4.4. Recommendations

- The identified barriers must be addressed by providing comprehensive and tailored research training programs for students. This involves offering workshops, seminars, and mentoring opportunities to enhance their research skills and provide necessary support and guidance throughout their projects.
- Improve the availability and quality of supervision and mentoring for students involved in research projects.
- Allocate additional resources and funding to support student research projects.
- Collaborate with external research institutions or organizations to provide students with access to a wider range of resources, data sources, and collaborative opportunities, enabling them to overcome potential barriers related to limited access to databases or research materials.
- For the Future, comparative studies are recommended with larger sample sizes among students of various ages, genders and from different academic institutions or regions to identify potential variations and address unique challenges faced by each group.

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