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ORIGINAL ARTICLE / ARAŞTIRMA MAKALESİ

Interprofessional Approaches in Research Planning Training: Multidisciplinary Perspective in Oral and Dental Health

Araştırma Planlama Eğitiminde Meslekleraras Yaklaşımlar: Ağız ve Diş Sağlığına Multidisipliner Yaklaşım

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ABSTRACT

Objectives: This study evaluates the effectiveness of an interdisciplinary educational intervention in improving the perceptions of interdisciplinary education, research competency, and research anxiety among postgraduate students in various health disciplines.

Materials and Methods: This prospective cohort study was conducted at Marmara University during November 2023. A two-day training program, "Multidisciplinary Approach to Oral and Dental Health" was conducted, involving educators and postgraduate students from dentistry, speech and language therapy, nutrition and dietetics. The program consisted of four modules, combining didactic training and workshops. Data were collected pre-post-intervention using validated scales: Interdisciplinary Education Perception Scale (IEPS), Research Competency Scale (RCS), and Research Anxiety Scale (RAS). Scores were analyzed using a t-test for pre-test and post-test calculations. In the findings, a p-value of <0.05 was considered statistically significant.

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Results: Initially, 30 participants were registered for the study, but the final analysis was conducted on 26 participants. The statistical analysis indicated significant improvements in the post-intervention scores for both the IEPS and the RCS. The average score for IEPS increased from 86.65 before the intervention to 91.04 after (p=.028), and for RCS, it rose from 25.92 to 28.08 (p=.010). However, RAS showed no significant change, with scores averaging 30.85 before and 30.65 after the intervention (p=.710).

Conclusions: The intervention effectively enhanced interdisciplinary education perception and research competency among participants, emphasizing the potential of short-term, structured multidisciplinary programs in postgraduate dental education.

Keywords: Interprofessional relations, dentistry, speech therapy, dietetics, research

ÖZ

Amaç: Bu çalışma, çeşitli sağlık disiplinlerinde lisansüstü eğitim alan öğrencilerin disiplinlerarası eğitim algılarını, araştırma yetkinliklerini ve araştırma kaygılarını iyileştirmede disiplinlerarası bir eğitim müdahalesinin etkinliğini değerlendirmektedir.

Gereç ve Yöntemler: Bu prospektif kohort çalışma, 2023 Kasım ayında Marmara Üniversitesi Diş Hekimliği Fakültesi'nde gerçekleştirilmiştir. Diş hekimliği, dil ve konuşma terapisi, beslenme ve diyetetik alanlarından eğitimcilerin ve lisansüstü öğrencilerin katıldığı "Ağız ve Diş Sağlığına Multidisipliner Yaklaşım" başlıklı iki günlük bir eğitim programı yürütülmüştür. Program didaktik eğitim ve atölye çalışmalarını birleştiren dört modülden oluşmuştur. Veriler müdahale öncesi ve sonrasında onaylanmış ölçekler kullanılarak toplanmıştır: Disiplinlerarası Eğitim Algısı Ölçeği (IEPS), Araştırma Yetkinliği Ölçeği (RCS) ve Araştırma Kaygısı Ölçeği (RAS). Toplanan skorlarlar pre-test post-test kıyaslamaları t-test kullanılarak analiz edilmiştir. İstatistiksel anlamlılık değeri olarak p<0.05 kabul edilmiştir.

Bulgular: Başlangıçta çalışma için 30 katılımcı kaydedilmiş, ancak nihai analiz 26 katılımcı üzerinde gerçekleştirilmiştir. İstatistiksel analiz, hem IEPS hem de RCS için müdahale sonrası puanlarda önemli gelişmeler olduğunu göstermiştir. Özellikle, IEPS için ortalama puan müdahale öncesinde 86.65 iken müdahale sonrasında 91.04'e (p =.028) ve RCS için 25.92'dan 28.08'ye (p

=.010) yükselmiştir. Bununla birlikte, RAS, müdahale öncesinde 30.85 ve müdahale sonrasında 30.65 puan ortalamasıyla önemli bir değişiklik göstermemiştir (p = .710).

Sonuç: Müdahale, katılımcılar arasında disiplinler arası eğitim algısını ve araştırma yetkinliğini etkili bir şekilde geliştirmiş ve mezuniyet sonrası diş hekimliği eğitiminde kısa süreli, yapılandırılmış multidisipliner programların potansiyelini vurgulamıştır.

Anahtar Kelimeler: Disiplinlerarası iletişim, diş hekimliği, konuşma terapisi, dietetik, araştırma

INTRODUCTION

The World Health Organization's (WHO) definition of oral health encompasses the basic functions and psychosocial effects of oral structure, which can change throughout life and are closely related to overall health (WHO, 2022). The Food and Drug Administration's (FDA) definition, on the other hand, links oral health to the presence or absence of diseases, comfort in social interactions due to teeth, and physiological functions like chewing and speaking (Glick et al., 2016). In light of these definitions, while the traditional roles of dentists have focused on assessing and managing oral cavity diseases, education and continuous professional development programs have not sufficiently emphasized other important aspects like physiological functions and psychosocial states (Glick et al., 2016). Considering the impact of oral health on an individual's overall health status, psychological well-being, and essential functions like speaking and eating, it becomes evident that health and social care sectors need to adopt an interdisciplinary educational approach that includes non-dental clinicians in oral health (Fisher et al., 2023). This approach is essential as no single discipline possesses all the knowledge required for patient care (Matziou et al., 2014), highlighting the necessity for integrated and person-centered oral health services that include non-dentist members as essential components of the healthcare team (Zaher et al., 2022).

Despite numerous calls to action, limited success has been reported in integrating oral health and its connection to general health into the education of healthcare professionals and in primary care practices, as well as in establishing collaborations (Goodell et al., 2019). Recent literature has reported on the outcomes of interprofessional education (IPE) initiatives, involving students from various health fields including dentistry, medicine, nursing, pharmacy, optometry, occupational therapy, physiotherapy, social work, and dental hygiene (Coan et al., 2019; Hartnett et al., 2019; Janotha et al., 2019). However, is a notable scarcity of studies conducted in conjunction with disciplines directly related to oral health, such as speech and language therapy or nutrition and dietetics. Increasing such studies could benefit health workers by fostering mutual recognition of roles and expertise, building trust and validation, and enhancing participants' willingness to contribute to the team (Stadick, 2020).

Alongside education and patient care, intraprofessional collaborations, long considered a core value in dentistry, are also crucial for research and innovation (Feinberg et al., 2015; Polverini, 2013). In recent years a growing recognition of the importance of interdisciplinary and transdisciplinary team-based collaborative research has been seen (Bennett & Gadlin, 2012; Buscemi et al., 2012; Wuchty et al., 2007). Larger teams, intentionally assembled to tackle a common hypothesis or objective across various research and educational fields, can help overcome these concerns (Waite et al., 2023). Such teams not only collaborate effectively but also integrate knowledge from different perspectives (Pelfrey et al., 2021), enhancing their capacity to address solution-focused research questions and overcome challenges (Conn et al., 2019; Thompson et al., 2021).

Our study aims to address a gap in the literature by evaluating the impact of a training program, which includes didactic education and workshops, involving educators from dentistry, speech and language therapy, and nutrition and dietetics, as well as postgraduate students from these disciplines. The program's objective is to assess its effect on participants' perception of IPE, their perceived research competence, and their levels of research anxiety.

MATERIALS AND METHODS

Ethics approval

Ethical approval for the study was obtained from the Non-Interventional Clinical Studies Ethics Committee of Marmara University, Faculty of Health Sciences (IRB Approval number: 26.10.2023/103).

Study design

In this study, a single-arm pre-post intervention quantitative research design was conducted to evaluate the effectiveness of the educational intervention in enhancing

interprofessional discipline perception and research anxiety among postgraduate student participants.

This prospective cohort study was conducted at Marmara University during November 2023. A two-day training program titled "Multidisciplinary Approach to Oral and Dental Health" was organized for this study. Educators from three disciplines (dentistry, speech and language therapy, nutrition and dietetics) were selected for the program. The criterion for educator selection was having previously conducted scientific research with the event coordinator (F.B.), who then invited them to participate as trainers. The program was promoted through the deanship of the faculties or professional organizations' social media accounts and WhatsApp groups, using educators from all three disciplines. The training was open to postgraduate students who had reached the thesis stage but had not yet determined their thesis topics.

While implementing targeted team training, learning objectives and inclusive goals were clearly communicated to participants beforehand. These objectives were succinctly set as enabling postgraduate students to plan multidisciplinary work. Participants were encouraged to think beyond their professional boundaries and engage in discussions that included other disciplines. The event comprised a total of four modules, each incorporating didactic trainings and workshops relevant to all three disciplines: 1=Research Planning, 2=Orthognathic Surgery, 3=Cleft Lip and Palate, 4=Workshop Activities. The Research Planning module covered identifying research questions, literature review, basic statistics, and ethical considerations. The Orthognathic Surgery and Cleft Lip and Palate modules included experiences and case studies from the educators of oral and maxillofacial surgery, orthodontics, speech and language therapy, nutrition and dietetics, and gastronomy. Practical applications were conducted for the final component of the course. During the workshop component, students jointly discussed research scenarios that could encompass all three disciplines. These scenarios were designed to facilitate: 1=Learning multidisciplinary work as health professionals, 2=Gaining fundamental literature search skills, and 3=Recognizing the need for interdisciplinary communication and teamwork in conducting research.

Sample size

Although the optimal size for multidisciplinary student groups remains undefined (Keijsers et al., 2016), it is recommended that each group should have no more than 10 members (Thompson et al., 2020). Consequently, a limit of 10 participants per discipline was set. For the workshops, groups of six were formed, comprising two individuals from each discipline, resulting in five groups in total.

In this study, a structured randomization method was used to evenly distribute participants across groups based on their disciplines. Initially, participants were listed in Microsoft Excel according to their respective disciplines, and a random number between 0 and 1 was assigned to each using Excel's "RAND( )" function. These numbers were used to randomly order participants within each discipline. Subsequently, groups containing an equal number of participants from each discipline were formed. This was done by allocating the first two participants from each ordered list to the first group, the next two to the second group, and so on until all groups were formed. This method ensured an equal representation of each discipline in every group.

Outcome variables

Before the event commenced and after its conclusion, data were collected from postgraduate students using validated and adapted instruments: the Interdisciplinary Education Perception Scale (IEPS), the Research Competency Scale (RCS), and the Research Anxiety Scale (RAS). These tools were employed to assess changes in participants' perceptions of interdisciplinary education, their research competencies, and levels of research anxieIEPS, developed in 1990(Luecht et al., 1990) and validated in Turkish in 2019(Terzioğlu et al., 2019). The in-class reliability coefficient of the IEPS was found to be r=0.920 and the internal consistency coefficient of Cronbach's alpha was α=0.926 and the scale was found to be highly reliable. It has 17-items, 3-subdimensions tool used to assess health care students' perceptions of IPE. The sub-dimensions are Competence and Autonomy (CA) which is measured with 1-3-5-7th items its sub-scale Cronbach's alpha value is α=0,823. Perceived Need for Collaboration (PNC) which is measured with 2-6-8th items and Cronbach's alpha value is 0.563. The Perception of Actual Cooperation (PAC) which is measured with the rest and alpha value is α=0.543. It's a 6-point Likert scale ranging from 1=strongly disagree to 6=strongly agree, with possible scores between 17-102. High total score and high sub-dimension scores indicate that the perception of interdisciplinary education is positive (Terzioğlu et al., 2019). To determine the research competencies of the participants, Büyüköztürk's one-factor 7-item RCS

was used.(Büyüköztürk, 1999) The items in the scale can be answered with "not at all", "a little", "moderately", "quite" and "completely" options. The highest score that can be obtained from this scale is 35 and the lowest score is 7. A high score on the scale indicates high anxiety and a low score indicates low anxiety. In the original form of the scale, Cronbach's alpha reliability coefficient was calculated as α=0.89. The RAS was developed by Büyüköztürk and it aims to determine participants' attitudes towards scientific research with 12 items under a single factor (Büyüköztürk, 1997). The scale has a five-point Likert scale ("strongly disagree", "disagree", "undecided", "agree", "agree" and "strongly agree"), with 7 items reflecting anxiety and 5 items not reflecting anxiety. The statements reflecting the anxiety state were coded as 5 for "completely agree" and 1 for "strongly disagree". ". As a result of this coding, there is a linear relationship between the scores obtained from the scale and the anxiety level and the lowest anxiety score is 12 and the highest anxiety score is 60. It's Cronbach's alpha value α=0.87

Statistics

For the age variable, mean and standard deviation values were calculated. Frequency values were computed for categorical variables such as gender, discipline, previous multidisciplinary training, research project experience, and the university. The survey values were analyzed using a t-test for pre-test and post-test calculations. In the findings, a p-value of <0.05 was considered statistically significant. Graphpad software was used for statistical analyses.

RESULTS

The study initially included 30 registered participants and conducted with 26 graduate students who participated in the "Multidisciplinary Approach to Oral and Dental Health" training at Marmara University Faculty of Dentistry. Two participants did not come to the event despite registering, and 2 participants were excluded from the study and not included in the final analysis because they did not attend the workshops on the last day and did not complete the post-test questionnaires. The study sample included young adults with a mean age of 25.12 ± 2.10 years ranging from 22 to 32 years. The gender distribution was heavily skewed towards females (n = 23) as compared to males (n = 3). Participants came from three academic disciplines, with the majority from nutrition and dietetics (n = 10) and dentistry (n = 10), followed by speech and language therapy (n = 6). Regarding previous education, 22 participants reported no prior education in the multidisciplinary area, while 4 had some previous education. In terms of project experience, 15 participants had no prior experience, while 8 had some experience. The participants were primarily from Marmara University (n = 15), with others coming from various universities. including Uskudar University, Istanbul Medipol University, Istinye University, Istanbul Aydin University, Atlas University, and Istanbul University (Table 1).

Table 1. Demographic and Academic Characteristics of Study Participants

Parametres	Mean (SD)	n
Age	25.12 (2.10)	
Gender		
Female		23
Male		3
Disciplines		
Dentist		10
Speech and Language Therapist		6
Dietitian		10
Previous education		
Yes		4
No		22
Previous project		
Yes		9
No		17
Educators		
Dentist		8
Speech and Language Therapist		2
Dietitian		5

Statistical analysis revealed significant differences between pre – and post-intervention measurements in two of the three scale. The IEPS-pre measurement showed significantly lower values (86.65 ± 12.20) compared to the IEPS-post measurement (91.04 ± 12.40), with a t-test yielding a p-value of .028 (Figure 1). The IEPS-pre CA measurement showed higher values (20.27 ± 3.58) compared to the post measurement (21.12 ± 3.41), with a Wilcoxon test yielding a p-value of .099. The IEPS-pre PNC subscale measurement showed lower values (16.65 ± 2.04) compared to the post measurement (17.27 ± 1.12), with a Wilcoxon test yielding a p-value of .368. The IEPS-pre PAC measurement showed significantly lower values (49.85 ± 8.02) compared to the post measurement (53.54 ± 8.44), with a Wilcoxon test yielding a p-value of .004 (Figure 2).

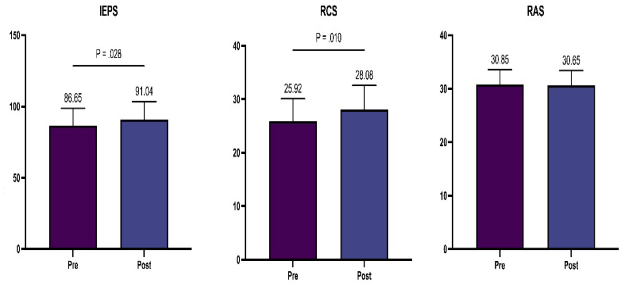

Figure 1: Bar Graph Comparing Mean Scores of Interdisciplinary Education Perception Scale (IEPS), Research Competency Scale (RCS), and Research Anxiety Scale (RAS) in Pre – and Post-Intervention Measurements.

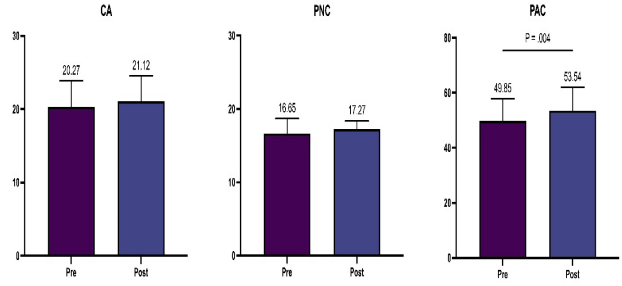

Figure 2: Competence and Autonomy (CA), Perceived Need for Collaboration (PNC), Perception of Actual Collaboration (PAC) subscale measurements of Interdisciplinary Education Perception Scale (IEPS).

DISCUSSION

Interdisciplinary Education Perception Scale(IEPS) and Research Competency Scale(RCS) showed significant different according to our results while Research Anxiety Scale(RAS) did not . And one of the subsclae of IEPS, The Perception of Actual Cooperation(PAC) showed a statistically significant increase. This meant that when postgraduate students work and were put into action together, their attitude to working interprofessionally is improving. Our results indicate that the course organized for the educational intervention positively impacted the perception of interdisciplinary education, research competency among postgraduate health students from three disciplines.

Interprofessional experiences can be designed through various approaches, including didactic sessions (Aleshire et al., 2019; Baker & Durham, 2013) clinical experiences (Hartnett et al., 2019; Janotha et al., 2019) a combination of didactic and clinical settings (Haber et al., 2017; Niranjan et al., 2019), simulations, or workshop activities (Christian et al., 2020; Haber et al., 2021). In our study, we combined didactic and workshop activities with two additional disciplines that might be challenging to include in a comprehensive curriculum. We believe interventions like ours can be beneficial, offering relatively cost-effective and efficient methods to enhance IPE.

Within the scope of interprofessional research activities, peer teaching provides a form of student interaction facilitated in formal professional contexts. In this context, learning becomes a socialization process where students have the opportunity to share their experiences from their own disciplines with students from other disciplines. This exchange not only enriches the learning environment but also fosters a broader understanding of different professional perspectives and approaches (Burgess et al., 2017; Burgess et al., 2019; van Diggele et al., 2020).

In the literature, there are IEPS studies in which attitudes towards interdisciplinary collaboration were questioned and the scores were found to be promisingly high (Büyüköztürk, 1997; Tosunöz et al., 2021; Williams & Webb, 2013). The IEPS is a multidimensional analysis. The sum of the scores obtained from the subscales and the scale are used together to interpret the perception of interdisciplinary education. In the literature, high values in these scores indicate an increased perception of interdisciplinary education and readiness for collaboration. According to the WHO definition, IPE is defined as two or more professionals receiving and learning information from each other and learning together (WHO, 2010). Similarly, in our study, total pre-post-IEPS scores were found high: 86.65 ± 12.20 and 91.04 ± 12.40, respectively. In the light of these data, we can interpret that the students in our study may be open to the WHO recommendations (2010) on interdisciplinary communication and cooperation for health professionals.

The post-test scores of IEPS subscales, CA and PNC were found to be high. These results showed that interdisciplinary collaboration was a desirable attitude among the participants in our study. In the PAC, the statistically significant increase in post-test scores indicates that the training improved students' perception of actual collaboration. In a similar study conducted with occupational therapy students, the greatest discrepancies in the responses of first-year students who were not in clinical rotation studies were found in the 9th item of the "perception of actual cooperation" subscale. Similar to this study, the increase we saw in our study supports the idea that interdisciplinary trainings

and simulations are the main lever of interdisciplinary collaborative approach (San Martín-Rodríguez et al., 2005). This approach is also an important requirement of modern healthcare (Bullard et al., 2019).

Similar to IEPS scores, RCS scores which shows researchers increased after the activity. Accurately assessing the level of RCS scores provides greater awareness of their research strengths and areas for improvement, and enables them to plan and implement strategies to further develop areas of research competence (Swank & Lambie, 2016). This also supports Picciotto's (1997) assertion about researcher competence: "In order for students to acquire research skills, they should be drawn into the research process and given the opportunity to participate in research activities themselves." (Picciotto, M., 1997).

Graduate students are required to complete one or more research studies during their continuing education. At the stage of designing these studies, methodological skills may be lacking because the training provided is often inadequate so students may experience anxiety when developing a research proposal. This anxiety can be multidimensional. After our activity, there was no significant change in anxiety scores of RAS. We think that the anxiety scale we used (Büyüköztürk, 1997) evaluates the researcher's attitude towards the act of "research" more and do not have factors that distinguish sub-anxiety topics. In conclusion, our study group consisted of volunteer research assistants with a high desire for multidisciplinary research. In order to evaluate multidisciplinary research anxiety, multifaceted scales such as Research Anxiety Rating Scale (RARS), which includes psychometric properties and consists of sub-headings such as library, writing, statistics, field research, research course, research utility and competence anxiety, are required (Mudra & Sastria, 2023).

The study observed that students from various health disciplines collaborated and exchanged knowledge, thereby strengthening their professional identities and enhancing teamwork. In the context of value-based healthcare systems, this development is expected to lead to better care outcomes in the long term (Sibbald et al., 2021). The participants' engagement in ice-breaking social activities before the main intervention further strengthened this collaboration (Shroque Zaher et al., 2022).

For future studies, we recommend adapting the current model to include other health professionals involved in designing joint research projects and patient care. This approach could continually and consciously encourage students to reflect on their professional and interprofessional identity development, but it would require investment in both student time and faculty development (Miller et al., 2023). Additionally, we advise allocating an extended time frame for planning research studies and propose longer follow-up studies to better understand the impacts of the conducted research. To ensure validity in different populations and settings, the designed measures should be tested with various research partners and stakeholders. This study can also be replicated with undergraduate students.

This study's limitations are as follows: First, the event only lasted two days, which limits our understanding of the long-term outcomes as no follow-up study was conducted. Second, the study focused on postgraduate students, highlighting the importance of structured learning opportunities for better preparation in interprofessional practices for this group. Third, the lack of a comparison group in the study limits the evaluation of the results; however, the consistency of findings across different disciplines and the significant changes observed between pre – and post-tests suggest the potential value of the experience. Fourth, the study is based on subjective evaluations, which could increase the risk of bias. Lastly, there is no definitive evidence on the replicability of the study and whether similar results can be achieved in different geographical locations and educational systems.

CONCLUSIONS

In conclusion, this easily replicable teaching method provides a straightforward tool to reinforce the importance of collaborative work in conducting multidisciplinary studies related to oral health. Particularly, this intervention offers a novel experience for postgraduate students across various disciplines, enhancing their readiness for interdisciplinary learning and collaboration. We encourage the adaptation of such interventions to increase students' engagement in interprofessional education and collaborative practices. As we move towards a more collaborative care environment, dental schools should seize opportunities to improve patient health while reducing costs and maximizing resources.

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