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Evaluate the Attitude of Radiology and Laboratory Technician Corporation in Pediatric Dental Clinic

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ABSTRACT

Background: Effective radiology and laboratory technician collaboration in pediatric dental clinic is essential for delivering high-quality patient care. It enhances patient outcomes, reduces healthcare costs, and improves job satisfaction. Despite its importance, collaboration between these professionals is often hindered by hierarchical structures and differing perceptions of roles, leading to conflicts and communication barriers. This study aimed to evaluate attitudes toward radiology and laboratory technician collaboration in pediatric dental clinic, testing hypotheses related to profession, gender, and work experience.

Methods: A cross-sectional study was conducted using a census sample of 543 radiology technician and 423 laboratory technician. The Arabic version of the Jefferson Scale of Attitudes toward Laboratory technician-Radiology technician Collaboration (JSAPNC) was used to assess attitudes. Data were analyzed using descriptive statistics, t-tests, ANOVA, and Pearson correlation analysis, with a significance threshold of $p < 0.05$.

Results: The study achieved a 42.85% response rate, with 414 participants (101 laboratory technician , 313 radiology technician s). Radiology technicians demonstrated significantly more positive attitudes toward collaboration than laboratory technician (mean score: 3.40 vs. 3.01; $p < 0.001$). Across all JSAPNC subscales, radiology technicians scored higher than laboratory technician , particularly on rejecting laboratory technician authority (mean score: 3.35 vs. 2.25). Attitudes were influenced by hospital department, with internal medicine radiology technician s showing the most positive views. Age was positively correlated with attitudes (correlation coefficient = 0.127), but no significant correlation was found with work experience.

Conclusion: Radiology technicians exhibited more collaborative attitudes than laboratory technician in pediatric dental clinic , supporting the hypothesis that role expectations influence perceptions of collaboration. However, gender differences among laboratory technician and the role of work experience were not significant. Efforts to enhance interprofessional collaboration should address hierarchical barriers and foster mutual respect between radiology technicians and laboratory technician .

Keywords: radiology, technicians , laboratory , corporation

INTRODUCTION

Interprofessional collaboration between laboratory technician and radiology technicians is essential and has been emphasized in various contexts (1, 2). This collaboration involves working together, sharing responsibilities for problem-solving, and making decisions to develop and execute patient care plans (3). As healthcare becomes increasingly complex, collaboration among healthcare professionals is key to improving service quality, particularly in hospitals where ongoing interactions between professionals are common. Radiology and laboratory technician teamwork can enhance patient outcomes, reduce healthcare costs (4),

increase job satisfaction (5), and ensure patient safety (6). Communication between radiology technician s and laboratory technician plays a critical role in the flow of information in healthcare settings. However, evidence suggests that poor or inadequate communication can lead to persistent conflict between radiology technician s and laboratory technician , contributing to medical errors and negative outcomes (4, 7). Additionally, unsatisfactory interprofessional relationships may partially explain the radiology and laboratory technician shortage and cause radiology technician s to leave the profession (8).

Both radiology technicians and laboratory technician play vital roles in patient care, but there is often a lack of mutual respect and appreciation for each other's roles (9). Previous studies have shown that doctors and radiology technician s perceive collaboration differently; doctors tend to see it as following orders, while radiology technician s view it as a more complementary role (10). Bujak and Bartholomew argue that while radiology technician s and laboratory technician are the two most important individuals in patient care, they often fail to communicate effectively, and when they do, their interactions are often dysfunctional (11). Traditionally, the relationship between radiology technician s and laboratory technician has been hierarchical, with doctors holding dominant roles, and radiology technician s being seen more as assistants than partners in holistic patient care (12).

In many healthcare settings, laboratory technician have historically held more authority compared to radiology technician s, leading to an imbalance in power. The organizational structure often positions radiology technician s under the direction of laboratory technician , which can diminish their sense of autonomy and respect, thereby hindering collaboration. To our knowledge, this study is the first to assess radiology and laboratory technician collaboration using the Arabic version of the Jefferson Scale of Attitudes toward Radiology and laboratory technician Collaboration. Based on the existing literature, sociodemographic factors such as gender and age are not significant influencers in shaping attitudes toward collaboration, whereas work experience and cultural factors play a more substantial role (6, 13–15). This study aims to describe the attitudes of radiology technician s and laboratory technician toward radiology and laboratory technician collaboration and to test the following hypotheses:

(H1) Radiology technician s have more positive attitudes toward radiology and laboratory technician collaboration than laboratory technician .

(H2) Female laboratory technician have more positive attitudes toward radiology and laboratory technician collaboration than male laboratory technician .

(H3) Attitudes toward radiology and laboratory technician collaboration are correlated with work experience.

These hypotheses are grounded in role theory (16, 17), which posits that individuals' activities are influenced by socially defined roles, and interactions are shaped by the position each person holds in a professional or social relationship. According to this theory, collaboration can be understood as a behavior shaped by role expectations, competencies, and behaviors required for each role. From the perspective of role theory, radiology technician s are expected to have more positive attitudes toward radiology and laboratory technician collaboration than laboratory technician , consistent with prior findings (14, 18). This is rooted in the historical differentiation of roles that positions radiology technicians at a lower professional status and reinforces cultural norms where radiology technician s are seen as followers or implementers of laboratory technician ' orders.

MATERIALS AND METHODS

This study utilized a cross-sectional design and was conducted in two major referral hospitals, within pediatric dental clinic. These hospitals are the largest in the region, serving a significant portion of the population.

All eligible radiology technicians and laboratory technician were invited to participate in the study. Eligibility criteria included being a formal employee with at least six months of work experience at the hospital. At the time of the study, there were 543 radiology technician s and 423 laboratory technician available. All eligible participants were included, resulting in a census sample.

Measures

The study employed the Arabic version of the Jefferson Scale of Attitudes toward Laboratory technician-Radiology technician Collaboration (JSAPNC). The scale was translated into Arabic following recommended guidelines (19), and its validity and reliability were tested, demonstrating psychometric robustness. The Cronbach’s alpha for the entire scale was 73.2 (range: 74.7–89.5), and the test-retest reliability was 70.9 and 69.7, respectively. The content validity index for individual items ranged from 0.77 to 1.00, while the scale content validity index ranged from 0.88 to 0.94.

The questionnaire consisted of two sections: the first section addressed demographic information, including age, gender, work experience, educational level, and workplace. The second section comprised 15 questions grouped into four factors, slightly modified from the original scale: (1) radiology and laboratory technician collaboration (items 3, 4, 5, 7, 9, 11, 12, and 13), (2) laboratory technician authority (items 14 and 15), (3) shared education (items 1, 2, and 6), and (4) the radiology and laboratory technician role in patient care (items 8 and 10).

Responses were measured on a 4-point Likert scale: (1) strongly disagree; (2) disagree; (3) agree; (4) strongly agree. For factor (2), the responses were reverse-scored, with a higher factor score assigned to a lower numerical answer and vice versa.

Statistical Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 22. Descriptive statistics such as frequencies, means, standard deviations, and percentages were used for quantitative variables. The t-test was used to compare two groups, and one-way ANOVA was applied for comparisons among three groups. A p-value of < 0.05 was considered statistically significant. Pearson correlation analysis was conducted to assess the relationships among quantitative variables.

RESULTS

Of the 966 radiology technicians and laboratory technician invited to participate, 414 responded, resulting in a response rate of 42.85%. Among the respondents, 101 (24.4%) were laboratory technician , and 313 (75.6%) were radiology technicians. The response rate was 57.64% for radiology technician s and 23.87% for laboratory technician . Males comprised 67.4% (279) of the participants, and 52.4% (217) were under the age of 35. Most radiology technician s had less than 10 years of work experience, whereas approximately half of the laboratory technician reported 11 to 20 years of experience (Table 1).

The t-test analysis revealed significant differences in attitudes toward radiology and laboratory technician collaboration between the two groups (t-test: 10.391; $p < 0.001$). Radiology technician s had a higher mean total score (3.40; SD: 0.30) on the four-point scale compared to laboratory technician (3.01; SD: 0.35) (Table 2). Across all four subscales of the questionnaire, radiology technician s consistently scored higher than laboratory technician , with statistically significant differences ($p < 0.001$).

For instance, in the "doctor's authority" factor (a higher score indicates a rejection of a laboratory technician-dominant role in patient care), radiology technician s scored a mean of 3.35 (SD: 1.38) compared to 2.25 (SD: 1.51) for laboratory technician . Individual item scores also showed radiology technician s demonstrating more collaborative attitudes than laboratory technician . Item-total correlations, which ranged from 0.26 to 0.68, supported the inter-item relationships. The weakest correlation was observed for the fourth item, "There are many overlapping areas of responsibility between laboratory technician and radiology technician s."

Radiology technician s in internal medicine wards showed more positive attitudes toward collaboration compared to those in surgical and maternity wards. They scored higher across all JSAPNC subscales, except for factor four, "radiology and laboratory technician role in patient care." The difference was particularly significant for factor two, "doctor's authority." A post hoc Bonferroni test identified significant differences between internal medicine and maternity departments ($p < 0.05$).

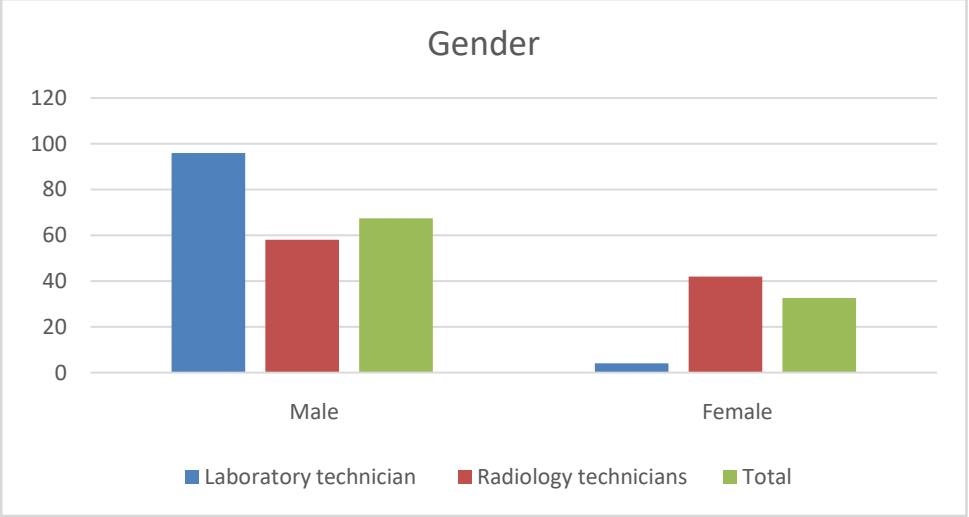
For laboratory technician , internal medicine specialists had higher scores than their counterparts in surgical wards across all subscales, though these differences were not statistically significant ($p > 0.05$).

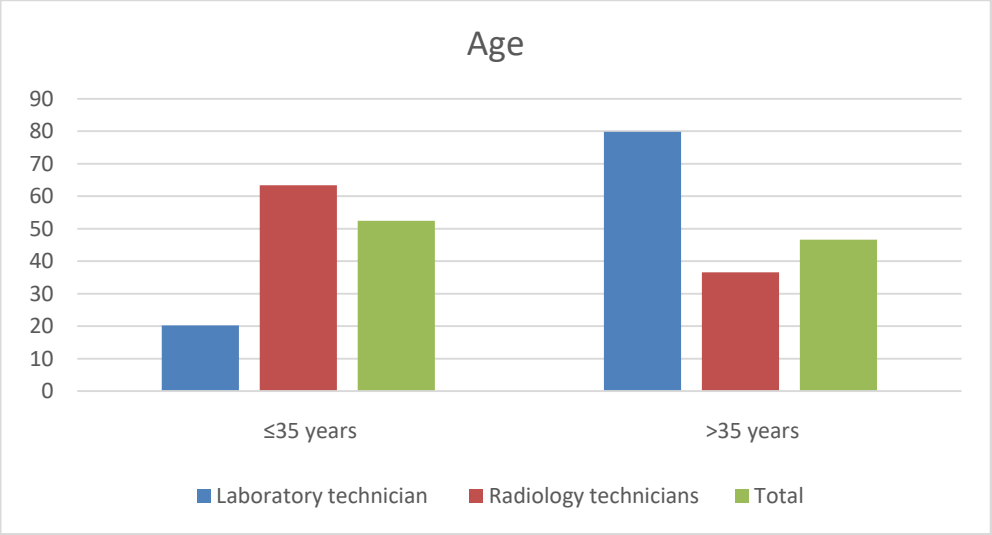
Among the subscales, "doctor's authority" (0.142) and "shared education" (0.169) showed the strongest correlations with age. Additionally, work experience was positively correlated with the "shared education" factor (0.108).

Table 1. Sociodemographic characteristics of participants (N = 414).

Variables	Laboratory technician (N = 101) (%)	Radiology technicians (N = 313) (%)	Total (N = 414) (%)
Gender			
Male	97 (96)	182 (58.1)	279 (67.4)
Female	4 (4)	131 (41.9)	135 (32.6)
Age			
≤35 years	20 (20.2)	197 (63.4)	217 (52.4)
>35 years	79 (79.8)	114 (36.6)	193 (46.6)
Place of work			
Surgical	77 (76.2)	147 (47.0)	224 (54.1)
Internal medicine	24 (23.8)	81 (25.9)	105 (25.4)
Maternity	0	81 (25.9)	81 (19.6)
Years of experience			
≤10 years	33 (32.6)	200 (63.9)	233 (56.2)
11–20 years	57 (56.4)	63 (20.1)	120 (29)
>21 years	11 (10.9)	50 (16.0)	61 (14.4)
Education			
Diploma	—	116 (37.1)	117 (28.3)
Bachelor	28 (27.6)	164 (52.4)	192 (46.3)

Master	41 (40.6)	21 (6.7)	62 (15.0)
Ph.D.	7 (6.9)	4 (1.3)	11 (2.7)
Board	25 (24.8)	—	25 (6)





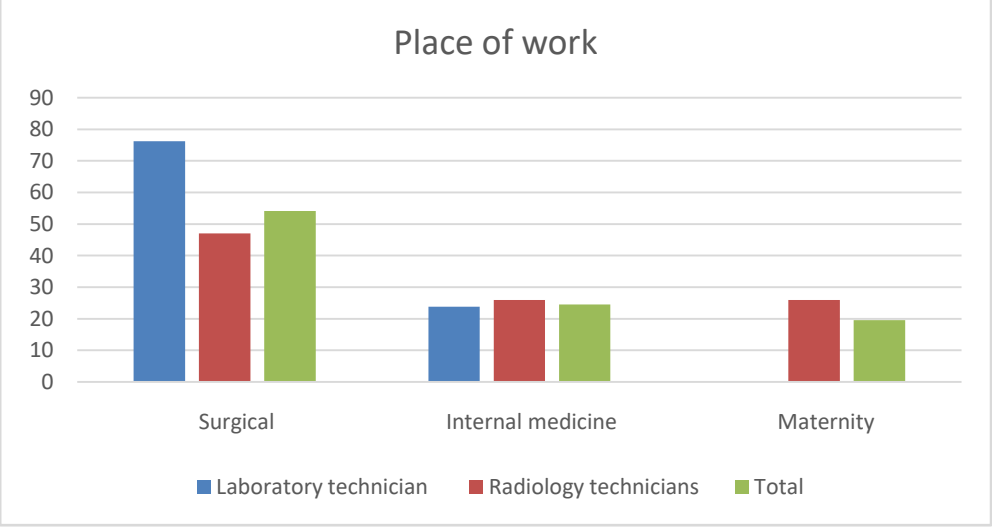


Table 2. Mean values and differences between laboratory technician and radiology technician s according to JSAPNC domains.

Factors	Professions	M (SD)	SEM	t	df	p value
F1: laboratory technician-radiology technician collaboration	Laboratory technician Radiology technician s	26.79 (3.14) 28.00 (2.74)	0.319 0.159	3.641	394	<0.001
F2: doctor's authority	Laboratory technician Radiology technician s	4.51 (1.51) 6.67 (1.38)	0.150 0.078	13.294	412	<0.001
F3: shared education	Laboratory technician Radiology technician s	8.63 (1.78) 9.97 (1.34)	0.179 0.076	6.868	135	<0.001
F4: radiology and laboratory technician role in patient care	Laboratory technician Radiology technician s	5.36 (1.38) 6.34 (1.29)	0.138 0.073	6.489	408	<0.001
Overall attitude	Laboratory technician Radiology technician s	45.28 (5.30) 51.12 (4.55)	0.547 0.265	10.391	387	<0.001

DISCUSSION

This research provides updated insights into radiology and laboratory technician collaboration in inpatient settings. Effective collaboration necessitates mutual respect, open communication, and shared decision-making (20). Collaboration involves joint problem-solving without hierarchical superiority between radiology technician s and laboratory technician . Traditionally, laboratory technician have viewed radiology technician s as subordinates responsible for implementing orders, which may influence healthcare workers' attitudes toward collaboration.

The study identified significant differences in attitudes toward collaboration between radiology technician s and laboratory technician , with radiology technician s demonstrating more favorable attitudes. This aligns with the "principle of least interest" described by Hojat et al. (14) and is supported by previous studies conducted in hospital-based settings (1, 21, 22). However, other research has reported contrasting results, such as laboratory technician in ICU settings showing more positive attitudes toward collaboration than radiology technician s (23, 24). These findings often reflect a hierarchical model of care, where radiology technician s are perceived as assistants to laboratory technician . Studies by Hojat et al. (14, 18) also highlight cultural differences, with American radiology technician s showing more positive attitudes toward collaboration compared to their counterparts in Italy and Mexico, likely due to their adherence to a complementary model of professional roles rather than a hierarchical one. Research by MacDonald and Katz (25) and Barrere and Ellis (26) suggests that improved understanding of the radiology and laboratory technician role can positively influence radiology technician s' attitudes toward collaboration. Conversely, limited knowledge of radiology and laboratory technician roles can hinder laboratory technician ' willingness to collaborate.

Analysis of the Jefferson subscales revealed that radiology technician s scored higher than laboratory technician across all subscales, including the psychosocial aspect of care. This indicates that radiology technician s generally have more favorable attitudes toward participating in psychosocial care and rejecting a dominant laboratory technician role. These results are consistent with previous studies conducted in various countries (6, 18, 27).

Both radiology technician s and laboratory technician expressed more positive attitudes toward "shared education," as reflected in item 2 of the survey. This finding is consistent with earlier publications by Thomson (21) and Sterchi (22). However, disagreements regarding the radiology and laboratory technician role in patient care were evident (items 8 and 10), with laboratory technician scoring closer to "disagree" and radiology technician s closer to "agree." Similar findings were reported in Sterchi's study (22), which attributed this discrepancy to insufficient organizational support for radiology technician s' contributions to holistic patient care.

The study revealed no significant differences in laboratory technician ' attitudes toward collaboration across hospital departments. For radiology technician s, a notable exception was seen in the "doctor's authority" factor, where significant differences were observed. Radiology technician s and laboratory technician in medical wards generally scored higher than their counterparts, reflecting more positive attitudes toward collaboration. This

could be due to the multidisciplinary nature of medical wards, which often necessitate coordinated care among various specialized disciplines. Chaboyer and Patterson (28) similarly found that radiology technician s in specialized wards exhibited more favorable attitudes toward collaboration compared to those in general wards.
Regarding correlations between attitudes toward collaboration and demographic factors, this study found a positive relationship between attitudes and age among radiology technician s and laboratory technician , contrasting with findings by Ward et al. (2) and El Sayed and Sleem (6). A possible explanation is that increased age may lead to greater acceptance of complementary care models and a more mature understanding of professional roles. However, no correlation was found between work experience and attitudes toward collaboration, differing from findings by Sterchi (22) and El Sayed and Sleem (6).

CONCLUSION

The findings supported one of the three research hypotheses. The first hypothesis, that radiology technician s exhibit more positive attitudes toward collaboration than laboratory technician , was confirmed. However, the second hypothesis, which examined the influence of gender among laboratory technician , could not be confirmed due to insufficient data on female laboratory technician . The third hypothesis, that work experience strongly correlates with attitudes toward collaboration, was also not supported by the findings.

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