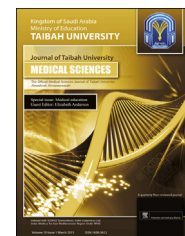




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Educational Article

Learning styles and satisfaction with educational activities among paediatric physicians at King Abdulaziz Medical City Jeddah



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المخلص

أهداف البحث: إن الدراسات التي أجريت لتقييم مستوى رضا أطباء الأطفال عن أساليب التعلم وارتباطها مع أنماط تعلمهم قليلة جدا. وتهدف هذه الدراسة إلى تحديد العلاقة بين أنماط التعلم عند أطباء الأطفال ونسبة الرضا عن أساليب الأنشطة التعليمية المختلفة.

طرق البحث: أجريت هذه الدراسة الوصفية المقطعية في قسم الأطفال، في مدينة الملك عبد العزيز الطبية بمدينة جدة، واستخدمت هذه الدراسة اختبار أسلوب التعلم الذي طوره ديفيد كولب، وتم أيضا تعديل واستخدام مقياس مدى الرضا عن أساليب الأنشطة التعليمية في قسم الأطفال، استنادا إلى استقصاء رضا الطلاب المعمول به في كلية المجتمع في ميتشيغان بالولايات المتحدة الأمريكية، واستخدمت الاستبانة الذاتية، التي شملت متغيرات أنماط التعلم والبيانات الديموغرافية، وكان متغير النتيجة مستوى نسبة الرضا عند الأطباء.

النتائج: كان عدد الأطباء الذين شملتهم الدراسة ٧٥ طبيبا، بمتوسط عمر ٣٦ عاما، كما كان ٥٢٪ من المشاركين ذكورا. لم يكن هناك نوع غالبا من أنماط التعلم بين أطباء الأطفال، كما لوحظ توزيع متساو تقريبا بين أنماط التعلم المختلفة. وأظهرت النتيجة أن أطباء الأطفال راضون بشكل عام، وكان متوسط نسبة الرضا عن أساليب الأنشطة التعليمية ٦٨٪. ولم يثر على أي ارتباط بين أنماط التعلم وأنواع ودرجة الرضا وأساليب الأنشطة التعليمية المختلفة.

الاستنتاجات: لا يوجد نوع غالب من أنماط التعلم بين أطباء الأطفال، في مدينة الملك عبدالعزيز الطبية بجدة. ويعتبر مستوى الرضا عن أساليب التعلم محدودا. ولا توجد علاقة بين أنواع أنماط التعلم ودرجة الرضا عن أساليب التعليم المختلفة. وهذا يشير إلى أن إعداد برنامج تدريبي للأنشطة التعليمية قد لا يتطلب النظر في أنماط التعلم للمتدربين، ويوصى كذلك بالتحقق وإجراء دراسة لمعرفة الأسباب.

الكلمات المفتاحية: أساليب التعلم; رضا الأطباء; برنامج تدريب أطباء الأطفال

Abstract

Objectives: Few studies have evaluated the degree of satisfaction of paediatricians with the academic instructional methods and the association of that satisfaction with their learning styles (LSs). The purpose of this research was to determine the correlation between paediatricians' LSs and their satisfaction with different instructional strategies.

Methods: This cross-sectional descriptive study was conducted at the Pediatric Department of King Abdulaziz Medical City (KAMC)-Jeddah, Kingdom of Saudi Arabia (KSA). The instruments used in the survey were the David Kolb LS inventory and a modified student satisfaction survey based on a similar survey from Mott Community College in Flint, Michigan. A self-administered questionnaire was administered using LSs and demographic data as the predictor variables. The satisfaction level of the physicians was considered the outcome variable.

Results: A total of 75 paediatricians were included in this study (mean age 36 ± 8.9 years, 52% males). Overall, no single predominant LS was reported; an approximately equal distribution of LSs was observed among the paediatricians. The satisfaction scores of the paediatricians showed that they were generally satisfied; however, the mean satisfaction score for education was only 68%. No correlation was found between LS types and the degree of satisfaction with instructional methods.

Conclusions: No single predominant LS was observed among the paediatricians of KAMC-Jeddah. The respondents showed an average level of satisfaction with

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the educational strategies. There were no correlations between the different LS types and the paediatricians' degrees of satisfaction with the instructional methods used. The results of this study suggest that the preparation of an educational training program may not require the consideration of LS. Further studies exploring the high level of dissatisfaction with instructional methods in paediatricians are recommended.

Keywords: Educational program; Learning styles; Paediatric residency training; Physician satisfaction

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Introduction

Physicians are overwhelmed by the amount of information available due to the continuous increase in scientific knowledge in the field of medicine; thus, an understanding of the principles of self-directed study needs to be developed for medical education. The investigation of LSs is a useful methodology that is exploited in undergraduate and postgraduate training because it offers a basis for teaching task-specific cognitive skills to doctors in medical colleges and residency training programs.¹ There are a variety of LS models, and the three most common are David Kolb's model^{2,3} (experiential learning theory), Honey and Mumford's model⁴ (a modified form of Kolb's experiential model), and Fleming's VAK/VARK model⁴ (categorizing individuals into visual, auditory and kinaesthetic learner categories).

David Kolb defines learning as "the process whereby knowledge is created through the transformation of experience".³ He explains learning as a cycle with four stages: concrete experience, observation and reflection, abstract concept formulation, and, lastly, active experimentation.³ The LS theory suggests that every person learns in a very different and characteristic manner. Each learning style is a unique way of obtaining information and is formulated by the individual's background and altered by his/her acquired knowledge and expectations in a particular situation.^{3,5} Kolb's experiential learning theory outlines two linked approaches for obtaining understanding: concrete experience and abstract conceptualization and two other methods associated with converting experience: reflective observation and active experimentation.^{3,5} To ensure effective learning, individuals try to practice all four methods; nevertheless, they tend to improve strong points in one experience-grasping technique and one experience-transforming technique. The subsequent LSs are mixtures of the person's favoured styles. The four LS styles are diverger, converger, assimilator and accommodator.⁶

These four LS styles are defined according to Kolb's concept that learning preferences pertain to two continuums, active experimentation-reflective observation and abstract conceptualization-concrete experience. The convergers, who

prefer active experimentation-abstract conceptualization, use real applications of thoughts and deductive reasoning to solve problems.⁵ The assimilators, who prefer reflective observation-abstract conceptualization, are highly capable of generating theoretical models via inductive reasoning; they outperform the users of the other three LSs at investigating wide-ranging material and organizing it into a manageable format.⁵ The accommodators, who prefer active experimentation-concrete experience, are more open to interacting with others and performing 'hands-on' work; furthermore, they respond well to on-the-spot situations and respond to challenges spontaneously rather than by logical analysis.⁵ Finally, the divergers, who prefer reflective observation-concrete experience, use imagination to solve problems, are excellent at developing concepts, and can offer keen insights from diverse perspectives.⁵

Numerous measurement tools exist to determine LSs. In the literature, Kolb's LS inventory (LSI) is the instrument most widely used by medical students and experts to postulate the LSs of different persons.^{3,5,6} According to the literature, persons who bear specific LSs prefer particular subject areas, and a person's LS may influence his/her preferences for specific teaching methods.^{7,8} Kolb's LSI has been used to evaluate the instructional preferences of physicians involved in family practice⁹ and internal medicine¹⁰ and residents in otolaryngology residency programs.¹¹ Kosower and Berman¹² compared the LSs of faculty members and paediatricians of an American Pediatric Department to evaluate possible implications for medical education and stated that, "knowledge of LSs may have significant implications for design and delivery of instruction to residents". In a study involving public health students, Piane et al.¹³ showed that LSs can predict test scores; assimilators obtained considerably higher scores on theoretical exams and considerably higher course grades than users of the other three LSs. Assimilators were also dominant in a study of attending physicians and internal medicine residents.¹⁴ Another study by Shugerman et al.¹⁵ in 2001 showed that general paediatricians had the highest rates of job satisfaction of all physicians.

In the literature, very few studies have assessed the satisfaction and educational accomplishments of paediatric physicians with regards to the teaching techniques used in relation to their LSs. Educational activities must be planned to obtain this information. The purpose of this study was to determine the LSs of paediatricians in the Pediatric Department of King Abdulaziz Medical City in Jeddah and the relationships between their learning styles and their satisfaction with diverse academic teaching techniques and various aspects of their work.

Materials and Methods

The study was conducted in the Pediatric Department at King Abdulaziz Medical City (KAMC) for National Guard in Jeddah. The paediatric service is provided by 14 different subspecialties including neonatology, paediatric intensive care, cardiology, endocrinology, neurology, nephrology, gastroenterology, genetics, metabolic disorders, infectious disease, immunology, allergy, rheumatology, pulmonology and general paediatrics. The department is staffed with 86

physicians, including the following: 26 consultants, two associate consultants, six assistant consultants, four board-certified physicians, eight staff physicians, 23 residents, four fellows, and 15 paediatric haematology physicians. The department of paediatrics admits six new residents and four fellows for training annually. The paediatric residency program is a competency-based program with many training and academic activities aimed at producing competent paediatric specialists who can obtain Saudi Board certification.

All physicians and board-certified doctors in the department were included at all levels of the residency program. At the time of this study, the total number of paediatric physicians was 86, and the total number of residents, including senior and junior residents, board-certified physicians and fellows who had recently completed the residency training program, was 26. The participants were males and females of different age groups, nationalities and undergraduate and postgraduate backgrounds. No specific sampling technique was used, as all physicians in the department were included.

Instruments

The survey instruments included the LS inventory (LSI) of David Kolb (Version 3.1), which had been previously well validated⁶ and a satisfaction questionnaire based on the Mott Community College Student Satisfaction Survey of the MCC Institutional Research Office in Flint, Michigan.¹⁶ Physician satisfaction was tested for multiple types of educational activities in the KAMC-Jeddah Pediatric Department. Both surveys were provided in English.

The questions in the satisfaction questionnaire were grouped in four themes: (1) the general environment of the department, such as the relationship between physicians and the administration, and appreciation of physicians and recognition of their achievements; (2) the available educational facilities, such as on-call rooms, classrooms, audiovisual media, and computer and internet services; (3) the theoretical academic activities conducted in the department, such as lectures, grand rounds, journal clubs and case presentations; and (4) the practical academic activities conducted in the department, such as clinical rounds, simulation sessions (e.g., BLS, PALS and NRP courses), educational procedures and workshops.

Variables

This was a cross-sectional study to collect quantitative data on two key variables, LSs and satisfaction levels of paediatric physicians. These variables were studied using the two questionnaires mentioned above.^{6,16} The predictor/grouping variables were demographic data (age, gender, nationality, level in residency training program, years of practice, level in the department, undergraduate and postgraduate study) and LSs. The outcome variable was the physician's satisfaction level/score. For the data analysis, the subjects in the study were placed into two groups: residents and consultants, and the consultants group also included all board-certified physicians. The levels of satisfaction in both groups were compared and analyzed with respect to the four LSs.

The data were entered and analyzed using the Statistical Package for Social Sciences software (SPSS) v.20. Descriptive statistics are presented as frequencies and percentages for the categorical variables, e.g., gender, nationality, LS, level in residency training (i.e., junior resident, R1 and R2, and senior resident, R3 and R4), and rank or position in the department (i.e., resident, board certified, assistant consultant, associate consultant, and consultant). Means \pm standard deviation are presented for numerical variables (e.g., age and satisfaction score). A 95% confidence interval was determined for the outcome variable (satisfaction score).

A chi square test was used to compare satisfaction scores between the four LSs, gender, and position/level of training (categorical variables). Student's t-test was used to compare between the four themes of satisfaction and gender or position if two groups (continuous variable and categorical variable if two groups). Analysis of variance (ANOVA) was used to compare the four themes of satisfaction and the LSs. A p-value of <0.05 was considered significant for the statistical tests.

Validity

We modified a few questions from the Mott Community College survey to accommodate our local educational activities. The modified questionnaire was reviewed by two faculty members from the Department of Medical Education to validate the survey for this local setting (face validity). The modified questionnaire was also validated by a pilot study using seven paediatricians; during the pilot study, no participants made queries regarding the questions, indicating that the questionnaire had a high level of readability. This was confirmed by a high Flesh-Kincaid Readability Ease score, indicating that the sentences were clear and easy to understand and unlikely to cause confusion among participants (content validity). The specific modifications to the questionnaire were made to include information relevant to the theory behind the planned study, with special consideration for the specific working conditions of the paediatrician participants. The modified questions included items, such as, "Do you think the KAMC Pediatric Department is warm, friendly and supportive of doctors?" and "Are you satisfied with the quality and availability of library resources?"

Reliability

We calculated Cronbach alpha for all questions (0.87), for the environment of education questions (0.79), for the facilities of education questions (0.59), for the practical education questions (0.78), and for the theoretical education questions (0.77).

Ethical considerations

The research proposal was approved by the Research Committee of the College of Medicine at King Saud bin Abdulaziz University for Health Sciences and King Abdullah International Medical Research Center. All participants received an explanation letter (in English and Arabic) to inform them of the purpose and process of the study and how

the data would be used. The cover letter of the questionnaire mentioned that filling and returning the questionnaire would be considered their consent for participation (informal consent).

An explanation session was conducted by the principal investigator on how to complete the survey materials, and an Arabic translation of difficult words was provided. The principal investigator explained any unclear questions and collected the completed questionnaires. Data collection, including the explanatory session, was conducted on five occasions to accommodate the busy schedules of the clinicians and improve the response rate.

The self-administered questionnaire did not request any identifying information to maintain the confidentiality and anonymity of the participants. We used the serial number of the questionnaires as an identifying variable in the data collection form, which maintained the confidentiality of the data.

Results

A total of 75 out of 86 people responded to the survey – response rate of 87%. The mean age of the respondents was 36 ± 8.9 years; 39 (52%) of the respondents were males and 36 (48%) were females (Table 1). For the participants, the mean number of years in paediatric practice was 8.7 ± 7.2 , and the mean number of working years in KAMC-Jeddah was 6 ± 5.4 . Medical school certificates had been obtained from Saudi Arabia for 53 participants (71%), from other regions of the Middle East for 14 participants (19%), and from other countries, such as the United States and Canada/Australia, for eight participants (10%). Twenty-one (28%) of the respondents were residents, and the majority of the respondents were consultants/associate consultants, 28 (37%), as shown in Table 1.

The overall distribution of the four learning style (LS) types for our entire study group is shown in Figure 1. The four LSs were equally distributed in this population, i.e.,

21 assimilators (28%), 20 convergers (27%), 17 divergers (23%), and 17 accommodators (23%). There was no predominant LS in the paediatricians; this study population included slightly more convergers and assimilators than divergers and accommodators, but these differences were not statistically significant.

Table 2 shows the distribution of the participants according to their position and level of training in the department. The Chi-Square test of independence was performed to compare the distribution of the learning styles by gender and position in the Pediatric Department, and it demonstrated a significant difference in LS between males and females, $\chi^2 (3, N:75) = 10.56$ ($p = 0.01$), as shown in Table 2. There was a higher proportion of males who were convergers (16, 41%), than females, (four, 11%) ($p = 0.003$). Twelve females (33%) were accommodators compared to only five males (13%) ($p = 0.03$). There was no significant difference in the learning styles between the residents and the rest of the participants, i.e., board-certified physicians to consultants, $(\chi^2 (3, N:75) = 1.1, p = 0.78)$, as shown in Table 2.

The second part of the study focused on the satisfaction of the respondents with the education program. The responses to the satisfaction survey questions were totalled, and the percentage mean scores were calculated. Figure 2 shows that the mean score for ‘total satisfaction with education’ was 83%. The satisfaction score for ‘facilities of education’ was the lowest at 68% and was the highest for ‘practical education’ at 93%.

There was no significant difference in the satisfaction scores between the male and female paediatricians (Table 3). The satisfaction with educational facilities score was the lowest of all satisfaction themes for both males (64.9 ± 13.5) and females (61.7 ± 14.1) (p -value of 0.32) and for both residents (59.2 ± 14.3) and senior paediatric physicians (64.9 ± 13.3), whose scores were not significantly different ($p = 0.11$).

Satisfaction with the ‘educational program’ used for the paediatrics training was also compared between the different learning style groups using one-way ANOVA. There were no significant differences for any of the LS groups ($p > 0.05$), as shown in Table 4. The mean % total score ranged from 65.3 ± 10.2 for the convergers to 70 ± 6.2 for the accommodators ($p = 0.42$).

Discussion

All LSs were preferred nearly equally among the paediatric physicians at KAMC-Jeddah that were included in this

Table 1: Participant’s characteristics and level of training/position in paediatrics.

Characteristics	N (%)
Response rate	75 (87%)
Age in years – mean	36 ± 8.9
Gender	
Males	39 (52%)
Females	36 (48%)
Practice in paediatrics in years	8.7 ± 7.2
Working years at KAMC-Jeddah	6 ± 5.4
Medical school certificate	
Saudi Arabia	53 (71%)
Middle East	14 (19%)
Others	8 (10%)
Level of training/Position in paediatrics	
Residents	21 (28%)
R1 and R2	11
R3 and R4	10
Staff physicians	12 (16%)
Board certified/Assistant consultants	14 (6 + 8) (19%)
Consultants/Associate consultants	28 (25 ± 3) (37%)
Total	75 (100%)

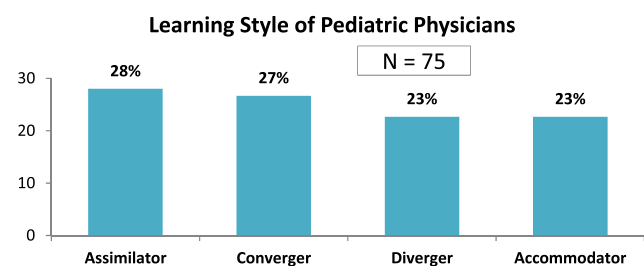


Figure 1: Learning style of paediatric physicians.

Table 2: Learning style by gender and position in paediatrics.

Learning Style	Total	Accommodator	Assimilator	Converger	Diverger	χ^2 , p-value
Male	39	5 (13%)	11 (28%)	16 (41%)	7 (18%)	10.56, 0.01*
Female	36	12 (33%)	10 (28%)	4 (11%)	10 (28%)	
p-value		0.03*	0.97	0.003*	0.31	
Residents	21	6 (29%)	6 (29%)	4 (19%)	5 (24%)	1.1, 0.78
Board-certified physicians to consultants	54	11 (20%)	15 (28%)	16 (30%)	12 (22%)	
p-value		0.45	0.95	0.35	0.88	

*Statistically significant at $p < 0.05$.

study, which suggests no predominant LS overall. However, we found a significant difference in LS between males and females; the majority of males were “abstraction-leaning” convergers (41%), while a similar majority of females were “hands-on” accommodators (33%). Similar results were found in the literature in other academic fields. For example, a meta-analysis of published enquiries on sex differences in the LSs of learners by Severiens and Ten Dam (1994) found that males were more likely than females to favour an abstract mode of learning.¹⁷ Significant LS gender differences were also found by Wehrwein et al. (2007) in a study of the LS preferences of physiology students using the Fleming’s VARK questionnaire.¹⁸ Choudhary et al. (2011) found a similar significant difference in LS preferences between first-year male and female medical students using the VARK model.¹⁹ However, it should also be noted that some other studies, such as Shaw et al. (1999), have observed no significant difference in LSs between genders.²⁰

Our study found that a majority of seniors (practicing paediatric physicians) were convergers (30%), while that learning style was the least common among residents (in-training paediatric physicians) (19%). This supports data in the literature indicating that students tend to gradually adopt LSs that are the most conducive to their area of study and that “abstract conceptualization” LS types (i.e., converger and assimilator styles) are the LSs that medical students tend to develop and prefer over time.^{13,14} Bitran et al. (2012) demonstrated that undergraduate medical students in Canada gradually became more convergent in their learning habits as their studies progressed over the course of seven years.²¹ Similarly, using the Honey and Mumford Learning Styles Questionnaire, Guraya et al. (2012) showed that the learning styles of male Saudi medical students shifted towards a predominantly “pragmatist” style over the first five years of undergraduate study,²² and

numerous analyses have indicated that Honey and Mumford’s “pragmatist” is roughly equivalent to Kolb’s “converger”.^{23,24} Our data corroborates and expands on these findings, showing that more experienced practicing physicians are more likely to prefer a convergent or assimilative learning style than less experienced doctors in training.

The paediatricians’ satisfaction scores in our study indicated they are generally satisfied with their educational program; the mean score of education satisfaction was 68%. However, one-third of the paediatricians (32%) were not satisfied with the educational facilities. In our study group, no difference was found in the satisfaction scores between male and female paediatric physicians (69% and 67%, respectively). Satisfaction with educational facilities scored the lowest of all satisfaction themes for both genders.

When we segregated our study results based on position or level of training to compare residents (in-training doctors) with consultants and senior paediatric physicians, we found no significant difference in satisfaction score between the two groups, but we did find that satisfaction with educational facilities scored the lowest of all satisfaction themes for both groups. Unfortunately, it is beyond the scope of this study to determine with sufficient precision the exact reasons for the high level of dissatisfaction of the paediatricians with the educational facilities at KAMC-Jeddah. Some possible sources of dissatisfaction include insufficient library resources (particularly online journals and publications) and inadequate study spaces (meeting rooms, etc.). This is an important area for further investigation.

No relation was observed between LS type and degree of satisfaction with education instructional methods. Convergers were found to have the lowest satisfaction level with education instructional methods (followed by assimilators) of the users of the different LSs, though this difference was not statistically significant.

Similar results in the literature also show no association between LSs and satisfaction degree. Batista and Cornachione (2005) showed that LS does not influence perceived learning or satisfaction in business-related studies,²⁵ and Gurpinar et al. (2010) showed that LS did not predict student satisfaction with altered teaching means in medical undergraduates in Istanbul.²⁶

Numerous previous studies have shown that examining (Kolb model) the LSs of undergraduate and postgraduate students is not valuable in medical education.^{27–33} In this study, learning outcome, exam score, was not investigated in relation to individual LSs.

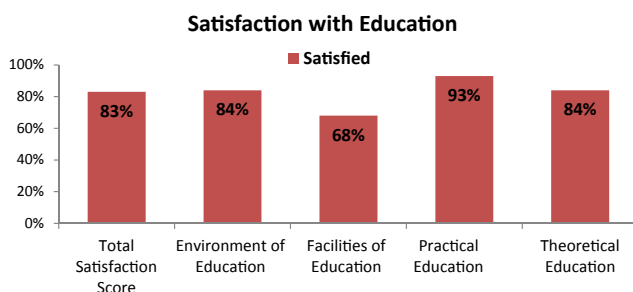


Figure 2: Satisfaction with education.

Table 3: Satisfaction by Gender and Position in Paediatrics (using t-test).

Percentage satisfaction score	Total satisfaction score (32)	Environment of education (10)	Facilities of education (6)	Practical education (7)	Theoretical education (9)
Males (n = 39)	68.8 ± 10.6	68.4 ± 14.2	64.9 ± 13.5	69.8 ± 12.1	71.1 ± 12.5
Females (n = 36)	67 ± 7	68.1 ± 9.3	61.7 ± 14.1	69.8 ± 9.5	67.2 ± 10
p-value	0.4	0.93	0.32	0.98	0.15
Residents (n = 21)	66.6 ± 6.7	70.1 ± 8.5	59.2 ± 14.3	66.8 ± 9.8	67.4 ± 8.4
Positions above Residents (n = 54)	68.5 ± 9.8	67.5 ± 13.2	64.9 ± 13.3	71 ± 11.1	69.9 ± 12.4
p-value	0.42	0.41	0.11	0.14	0.4

Table 4: Satisfaction by learning style (ANOVA test).

Percentage satisfaction score	Diverger (n = 17)	Assimilator (n = 21)	Converger (n = 20)	Accommodator (n = 17)	p-value
	Mean ± sd	Mean ± sd	Mean ± sd	Mean ± sd	
Total satisfaction score	69.3 ± 8.3	67.7 ± 10.3	65.3 ± 10.2	70.0 ± 6.2	0.42
Environment of education	70.7 ± 10.1	67.6 ± 13.4	66.6 ± 13.3	68.5 ± 11.1	0.77
Facilities of education	67.3 ± 15.5	61.9 ± 12.6	59.8 ± 15.4	65.3 ± 10.8	0.36
Practical education	69.4 ± 8.8	69.8 ± 11.8	67.1 ± 12.3	73.3 ± 9.5	0.40
Theoretical education	68.9 ± 8.3	70.2 ± 12.8	66.2 ± 13.7	71.9 ± 9.4	0.49

This study has several strengths. It involved a well-designed survey, had a sufficient number of participants, and used well-validated instruments. In addition, it provides paediatrician-specific and institution-specific corroboration of data collected elsewhere in more general settings in regards to the possible relationship of LS with educational activity satisfaction; thus, the results of this study have many implications for both learning and teaching in postgraduate programs.

One limitation of this study was that the data were quantitative; this study did not generate more qualitative data that could provide useful information regarding the degree of participant satisfaction and did not comprehensively examine the reasons for participant dissatisfaction. We examined various independent variables that could affect the dependent variable (the level of satisfaction), such as gender, age, years of practice, and educational background; however, not all of those independent variables can be used for actual adjustments to curricula. The study also involved a mixed population (staff physicians, residents, etc.) who viewed satisfaction with instructional methods and learning from a wide variety of perspectives. Moreover, the study was only performed in a single department within a single institution, and generalization would require more varied methodologies and a multicentre approach.

Conclusions

The results of this study demonstrate a lack of any significant satisfaction differences across LSs, suggesting that the educational program at the Pediatric Department of King Abdulaziz Medical City (KAMC)-Jeddah, Kingdom of Saudi Arabia (KSA), does not need to be altered based on specific LSs to achieve paediatric physician satisfaction. The satisfaction of paediatricians at our institution is not influenced by LS. This result indicates that directors of training

programs might not need to know trainees' LSs to develop suitable educational programs.

Recommendations

Further exploration is needed to determine the reasons for the high level of dissatisfaction with education facilities among paediatric physicians. This information would likely aid in the improvement of educational programs in the future.

In future studies, it would be valuable to determine if LS influences the performance and the assessment scores of in-training paediatric physicians, as this study did not explore the learning outcome, exam score, in relation to individual LSs.

Additional research should include a qualitative analysis of the degree of satisfaction to help explain the observed difference in LSs between genders. Future studies could also discuss the relationship between satisfaction and LSs with a multicentre approach at national or international centres.

Conflict of interest

The author has no conflict of interest to declare.

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