

Assessment of the Study Habits of Residents in Physical Medicine and Rehabilitation Programs in Saudi Arabia: A Cross-Sectional Study

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Background: Residents in training must employ a variety of study strategies, as they not only participate in academic studies but also interact with patients. This study aimed to evaluate the study practices and factors affecting those practices among Saudi Arabian physical medicine and rehabilitation residents during their residency program.

Methods: In this cross-sectional study, a previously used questionnaire was distributed to Saudi Arabian physiatry residents from July 1 to August 15, 2022, via a social media platform and completed using a Google Forms survey. A Microsoft Excel spreadsheet was used to collect, clean, and import the data before IBM SPSS Statistics for Windows, version 22.0 was utilized for statistical analysis.

Results: The data of 94.91% of respondents were included in the analysis. Individuals who were female, unmarried or divorced, and without children predominated. Only 17.9% ($n = 10$) of the residents believed that their training program effectively prepared them to pass the board examination, which was the most strongly motivating factor for studying for 85.7% of respondents. Over two-thirds of the residents mentioned that they regularly exercise. Residents who studied more than 11 hours per week had a significantly lower score in the category of factors that negatively affect examination performance ($M = 12.33 \pm 2.82$, $F = 2.794$, $P < 0.05$). Females, final-year residents, and Riyadh residents studied more than their counterparts.

Conclusion: Our study is the first to investigate how Saudi physiatrists study, with the finding that current physiatry residents employ a combination of traditional and contemporary learning strategies. This information can help stakeholders to understand current training challenges, improve the quality of training for physiatry residents, and create an ideal learning environment.

Keywords: cross-sectional study, questionnaire, performance assessment, students, learning systems, physiatry

Background

Adult learners' study habits have been extensively researched to understand the cognitive processes involved in studying and enable the development of diagnostic and predictive tools. Study strategies include any cognitive, affective, or behavioral activity that facilitates encoding, storing, retrieving, or using knowledge.^{1,2}

The study habits of medical and health sciences students are complex, as students are involved not only in academic studies but also in direct patient interactions. Medical school thus poses a particularly demanding challenge for undergraduate medical students. As a result, students are pushed to design more effective and efficient study methods, as choosing effective learning strategies in medical school is critical to students' success.³

During the post-graduation or residency period, the demand on residents increases alongside rising clinical hours, as both academic and other responsibilities grow. The study habits of adults have been broadly measured to assess the cognitive processes involved in learning. A competent trainee achieves predetermined knowledge goals and exhibits adequate clinical performance. In addition to the demanding needs of clinical care, trainees must acquire significant factual knowledge and skills during their residency.⁴

Along with the demands of clinical care, residents are required to engage in medical education during their residency and amass a corpus of factual knowledge. Numerous studies have been conducted on clinical training for residents to improve practical skills, but less attention has been devoted to developing more efficient nonclinical methods of studying and learning.⁵

Physical medicine and rehabilitation physicians, also known as physiatrists, are trained in the management, prevention, diagnosis, and treatment of people who are disabled due to disease, disorder, or injury, such as spinal cord damage, stroke, traumatic brain injury, amputation, pain conditions, and a variety of disorders involving the nervous and musculoskeletal systems, to improve their function, independence, and quality of life. Physiatrists receive intensive training in treating musculoskeletal disorders and injuries during their residency.⁶

In the Kingdom of Saudi Arabia (KSA), physiatry is a rapidly expanding medical specialty, with more than 120 specialists now practicing and nearly 60 residents in training in the central region (Riyadh city) and western region (Taif city).⁷ The residency program is structured as a four-year training program that includes both didactic and clinical components. Trainees are exposed to various aspects of core physiatry training, including rehabilitation of spinal cord injury, traumatic brain injury, stroke, and many others.

To our knowledge, no studies have examined residents' study habits. As a result, this study aimed to assess how Saudi Arabian physiatry residents study during their residency program.

Materials and Methods

Study Design

In the current study, a cross-sectional design was followed to assess physical medicine and rehabilitation, or physiatry, residents' study habits.

Study Sample

All 60 physiatry residents in the Kingdom of Saudi Arabia were contacted via social media platform (WhatsApp) and requested to participate in filling out the online questionnaire about their study habits. Moreover, a reminder was sent every 15 days.

Survey Instrument

In the current study, with informed permission we adopted a previously used questionnaire.⁸ The survey instrument was content validated. The survey asked participants about their demographic characteristics, residency level, and in which city they were doing their residency. Furthermore, the questionnaire's study habits section was divided into five sections: study motivational factors, study resources, study methods, study habits, and exam performance factors. Every item in each category was assigned a score between 1 and 5, with 1 representing a low score and 5 representing an excellent score. The average performance was calculated by adding the scores for each item. This resulted in score scales of 5 to 25, 9 to 45, 5 to 25, 5 to 25, and 4 to 20 for study motivational factors, study resources, study methods, study habits, and exam performance factors, respectively.

Data Collection

Online surveying was done using a Google survey form. All participants were made aware of the study's goals before their informed consent was obtained. Over a month, data was collected (15th July 2022 to 15th August 2022). Data were kept confidential and were only made public for research.

Statistical Analysis

Online data were gathered, cleaned, and imported to a Microsoft Excel spreadsheet which was password protected before being analyzed using IBM SPSS Statistics for Windows, version 22.0 (IBM Corp., Armonk, N.Y., USA). For categorical variables, the findings of the descriptive analysis were provided as frequencies and percentages, as well as means and standard deviations (for continuous variables). Inferential analyses were performed to determine the relationship between

sociodemographic factors and study practices. ANOVA and *t*-tests for associations were also included. Relevant statistics and *p*-values were used to present the results of these tests. The significance level used for all tests was $p < 0.05$.

Results

The questionnaire was completed by 59 residents. Three forms were excluded due to inconsistencies; thus, the data of 56 (94.91%) psychiatry residents were reviewed. Approximately two-thirds of respondents were between 24 and 28 years of age (67.9%). Residents who were female, single or divorced, and without children predominated. Residents from Riyadh made up 73.2% ($n = 41$) and residents from Taif made up 26.8% ($n = 15$) of the sample.

The distribution of respondents over the four years of the residency program was consistent, with the sample comprising 26.8% ($n = 15$) third-year residents, 26.8% ($n = 15$) second-year residents, 23.2% ($n = 23$) first-year residents, and 19.6% ($n = 11$) final-year residents.

A majority of residents studied for two to five or six to ten hours weekly, while 16.1% ($n = 11$) of residents studied for 11 hours or more weekly.

Only 17.9% ($n = 10$) of the residents felt that the training program prepared them adequately to perform well on the board examination, while 37.5% ($n = 21$) felt that the training program did not prepare them adequately and 44.6% ($n = 25$) were unsure if it did. [Table 1](#)

Table 1 Sociodemographic Characteristics

Variable	Frequency (n=56)	Percent
Age Group		
24–28 years	38	67.9
29 and above	18	32.1
Gender		
Males	23	41.1
Females	33	58.9
Marital status		
Single/Divorce	44	78.6
Married	12	21.4
Raising children		
No	49	87.5
Yes	7	12.5
Location of the residency program		
Riyadh	41	73.2
Taif	15	26.8
Current level in residency		
R1	13	23.2
R2	15	26.8
R3	17	30.4
R4	11	19.6

(Continued)

Table I (Continued).

Variable	Frequency (n=56)	Percent
Number of hours spent studying for residency program per week		
<2 hours	7	12.5
2–5	20	35.7
6–10	20	35.7
11+	9	16.1
Received mental help in the last two years		
Yes	20	35.7
No	36	64.3
Feel training program prepared me adequately to perform well on the board exam		
Yes	10	17.9
NO	21	37.5
Maybe	25	44.6

The final board examination was the most motivating factor for study for a majority of residents, followed by the annual promotion examination and end-of-rotation evaluation, as reported by 85.7%, 73.2%, and 62.5% of the residents, respectively. Preparation for the clinic and case-based study discussions were the least motivating factors, according to 23.2% and 12.5% of residents, respectively (Figure 1).

Regarding study materials and resources, textbooks such as Physical Medicine and Rehabilitation Board Review, DeLisa's Physical Medicine and Rehabilitation, Braddom's Physical Medicine and Rehabilitation, and others were the most useful. These textbooks were considered extremely useful by 78.6% of residents. Review courses and study notes prepared by other residents were reported to be highly useful by 76.8% and 71.4% of residents, respectively.

MOTIVATING FACTORS

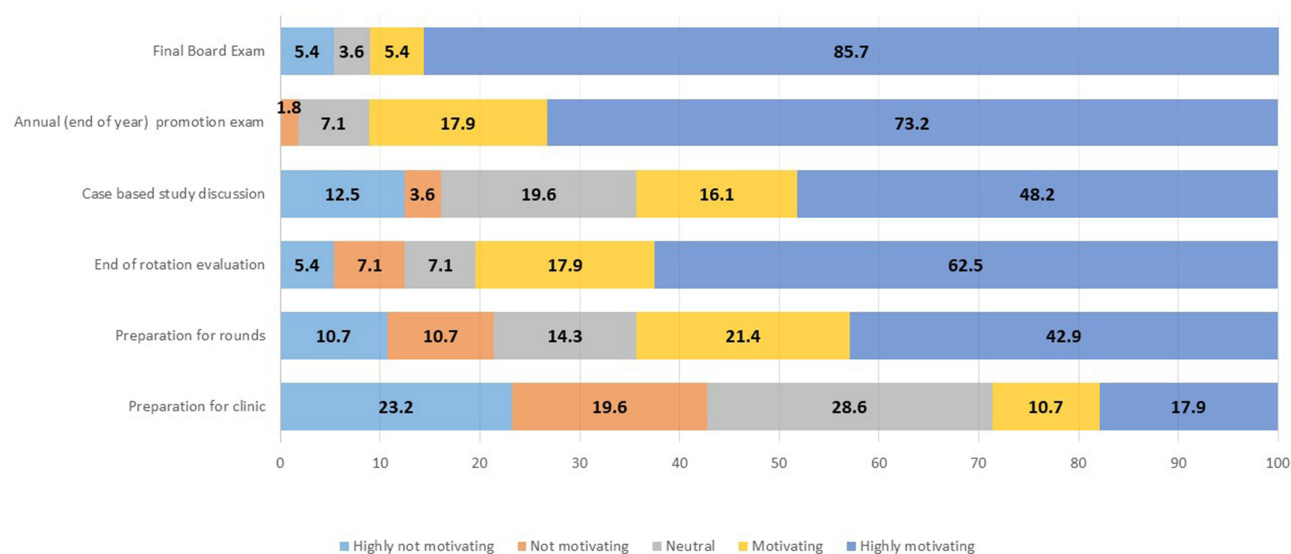


Figure 1 Motivating factors of the psychiatry residents.

Departmental academic meetings, journal club meetings, and social media platforms were highly useless resources, according to 26.8%, 26.8%, and 26.8% of the residents, respectively. Furthermore, physical medicine and rehabilitation journals were considered highly useless and useless by 19.6% and 21.4% of residents, respectively (Figure 2).

We found that a majority of residents preferred review courses (66.10%). Independent study, dedicated lectures, and interactive teaching were highly preferred as study methods by 58.9%, 58.9%, and 57.1% of the participants, respectively. (Figure 3).

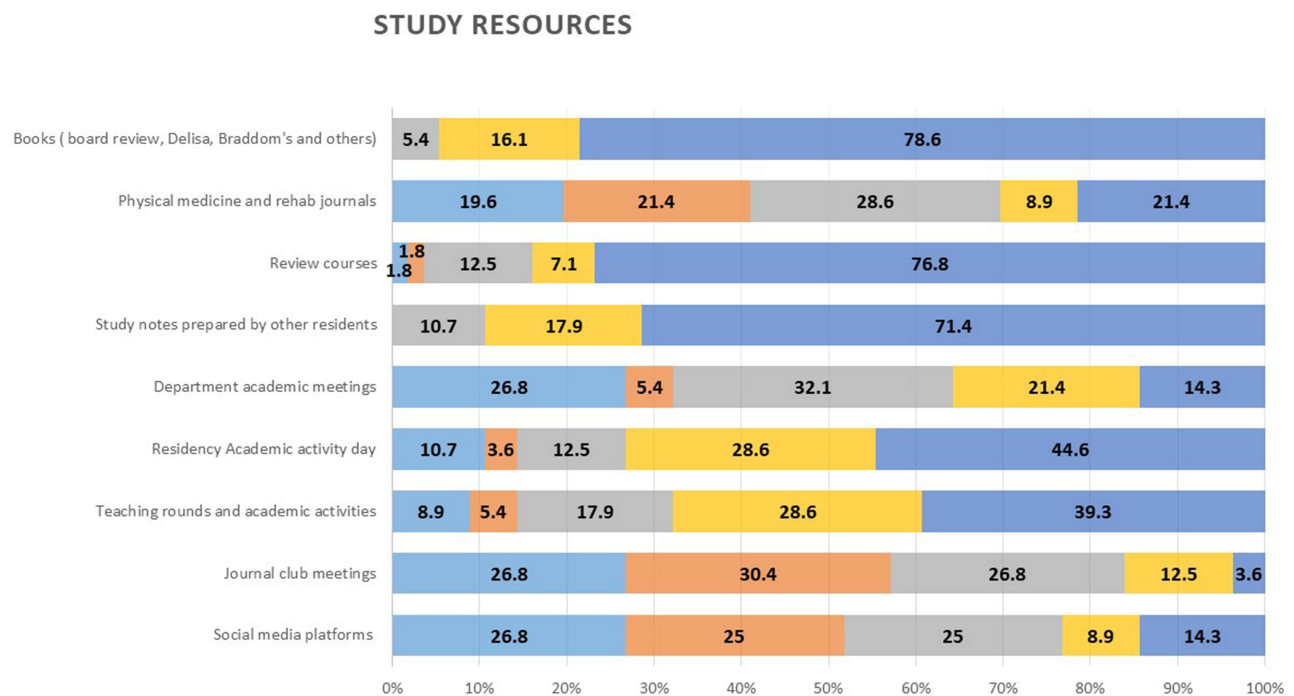


Figure 2 Resources for the study used by the residents.

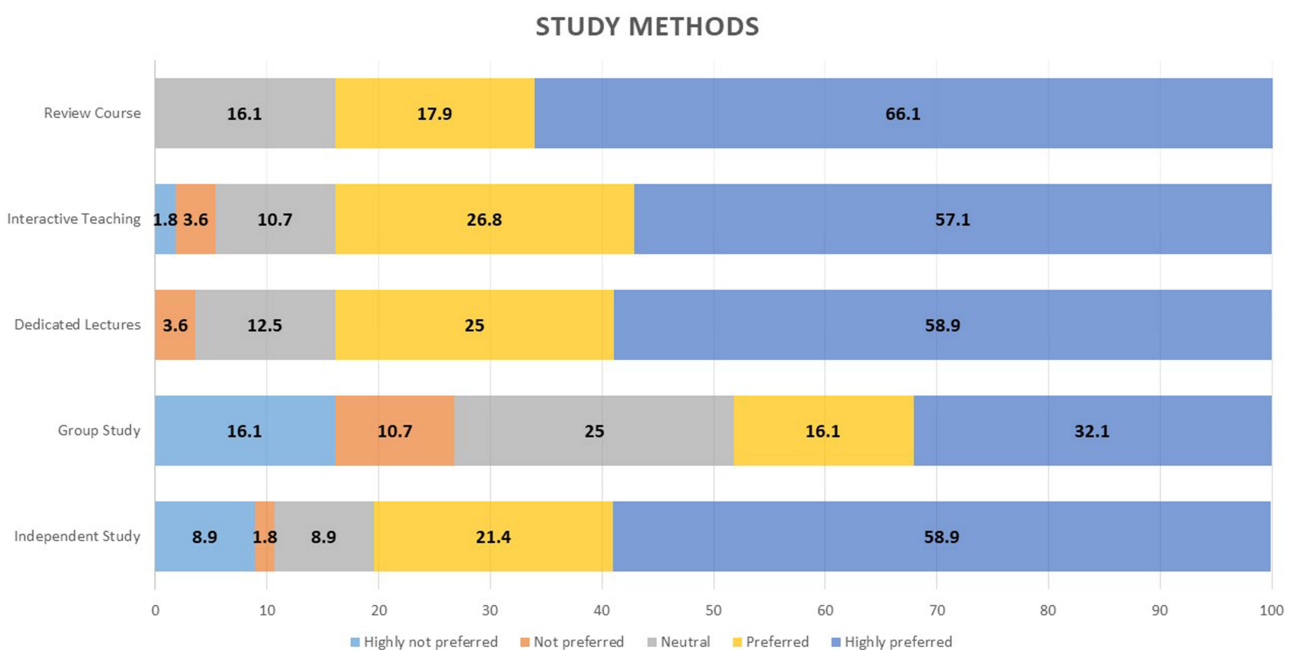


Figure 3 Preference of study methods among the residents.

The majority of respondents reported that they frequently had sufficient sleep while studying (67.9%). Exercise was a habit for more than two-thirds of the residents, and 21.4% opposed staying up late to study or prepare for an examination. Regarding their study/exam preparation habits, 57.1% and 51.8% of the residents, respectively, strongly agreed with consuming coffee and taking breaks while studying (Figure 4).

When questioned about factors that negatively impact their performance on board or promotion examinations, the most prevalent factors were on-call obligations (71.4%), insufficient teaching during residency training (37.5%), and continued clinic duties while studying (30.4%). Although limited clinical exposure was a factor evaluated as unfavorable to examination performance, fewer respondents (26.8%) agreed that this was a problem for them (Figure 5).

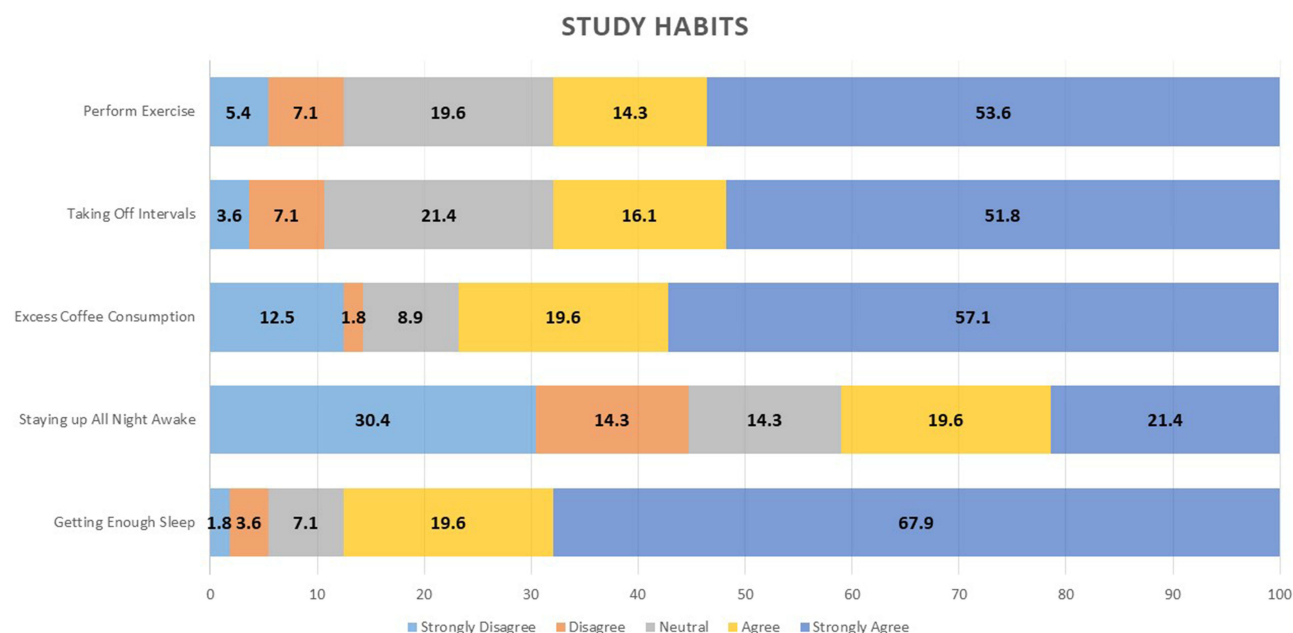


Figure 4 General study habits of the residents.

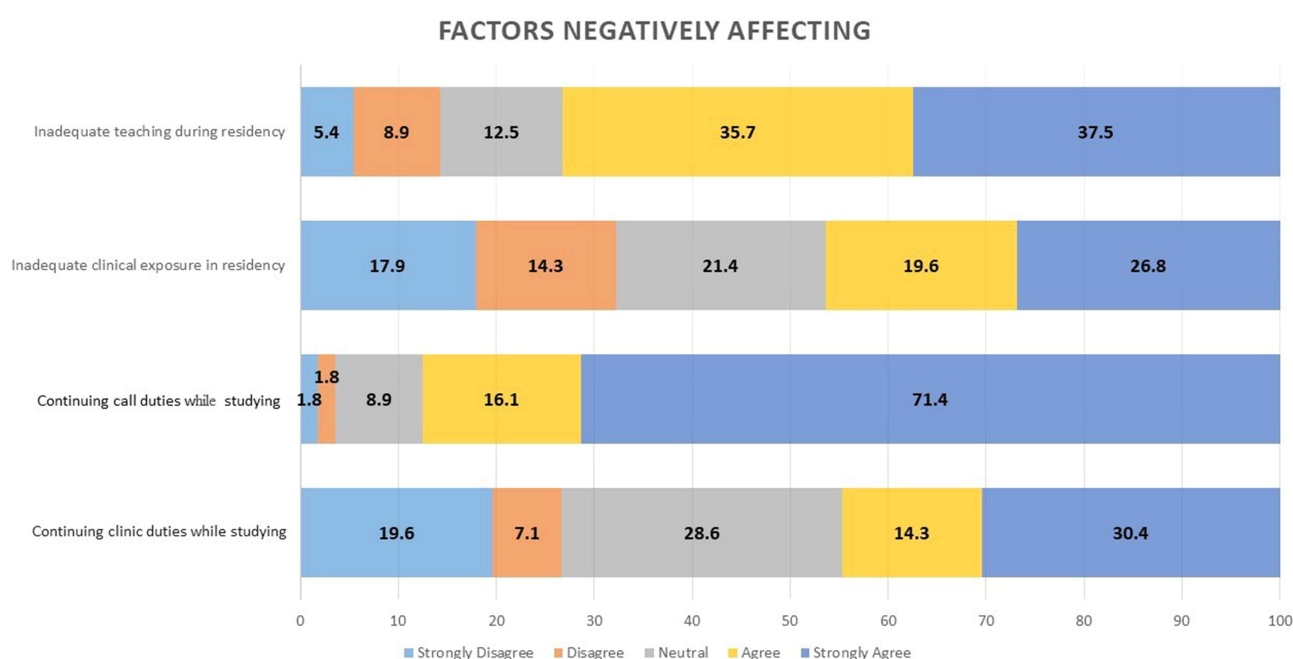


Figure 5 Factors negatively affecting the outcomes.

We analyzed differences in study habits, including motivational factors, study resources, and study methods, based on sociodemographic factors, current residency level, residency location, and number of hours spent studying. Residents who spent more than 11 hours per week studying had a significantly lower score on factors negatively affecting examination performance ($M = 12.33 \pm 2.82$, $F = 2.794$, $P < 0.05$; Table 2).

Residents who were under the age of 28 years, from Taif, single, without children, and in their second year as well as those who studied for more than six hours per week had higher motivating factor scores. Furthermore, residents who

Table 2 Relationship Between Sociodemographic Factors and Study Habits

Variables	Values	Motivating Factors	Study Resources	Study Methods	Study Habits	Factors Negatively Affecting Exam Performance
Age	24–28 years	20.31 \pm 3.51	32.13 \pm 4.56	20.94 \pm 0.378	19.65 \pm 2.94	14.94 \pm 3.262
	29 years +	19.61 \pm 3.23	33.05 \pm 4.74	20.50 \pm 0.41	19.22 \pm 3.15	15.00 \pm 3.23
	T-Test	$t=0.717$	0.637	$t=0.797$	$t=0.506$	$t=-0.057$
	P-value	$p=0.464$	0.488	$p=0.430$	$p=0.615$	$p=0.955$
Sex	Male	20.56 \pm 2.51	33.30 \pm 4.34	20.91 \pm 2.04	20.39 \pm 2.82	14.86 \pm 2.92799
	Female	19.75 \pm 3.92	31.81 \pm 4.73	20.72 \pm 2.26	18.90 \pm 2.99	15.03 \pm 3.45945
	T-Test	$t=0.936$	1.194	$t=0.320$	$t=1.865$	$t=-0.182$
	P-value	$P=0.353$	0.238	$p=0.750$	$p=0.068$	$p=0.856$
Marital Status	Single/ divorced	20.72 \pm 2.53	32.63 \pm 4.38	20.65 \pm 2.07	19.77 \pm 2.77	14.72 \pm 3.35749
	Married	17.75 \pm 5.06	31.66 \pm 5.46	21.33 \pm 2.46	18.58 \pm 3.65	15.83 \pm 2.62274
	T-Test	$T=1.970$	0.644	$t=-0.868$	$t=1.227$	$t=-1.054$
	P-value	$P=0.071$	0.522	$p=0.399$	$p=0.225$	$p=0.296$
Raising children	Yes	20.06 \pm 3.38	32.40 \pm 4.70	20.75 \pm 2.25	19.53 \pm 3.06	14.97 \pm 3.38187
	No	20.28 \pm 3.94	32.57 \pm 4.07	21.14 \pm 1.34	19.42 \pm 2.63	14.85 \pm 1.95180
	T-Test	$T=-0.143$	0.796	$t=-0.644$	$t=0.084$	$t=0.093$
	P-value	$P=0.890$	0.931	$P=0.532$	$p=0.934$	$p=0.926$
Location of residency	Riyadh	20.07 \pm 3.09	32.68 \pm 4.45	20.95 \pm 2.36	19.24 \pm 3.21	14.73 \pm 3.39871
	Taif	20.13 \pm 4.30	31.73 \pm 5.06	20.40 \pm 1.45	20.26 \pm 2.18	15.60 \pm 2.69391
	T-Test	$T=-0.058$	0.681	$t=1.046$	$t=-1.354$	$t=-0.891$
	P-value	$P=0.954$	0.499	$P=0.302$	$p=0.184$	$p=0.377$
Current level in residency	R-1	19.53 \pm 2.50	33.00 \pm 4.18	20.00 \pm 2.61	19.53 \pm 2.93	14.92 \pm 3.06
	R-2	21.20 \pm 2.85	33.13 \pm 3.75	21.60 \pm 2.19	20.46 \pm 2.74	16.06 \pm 2.91
	R-3	19.94 \pm 4.49	31.94 \pm 5.94	20.76 \pm 1.67	19.4 \pm 2.98	14.35 \pm 3.16
	R-4	19.45 \pm 3.20	31.54 \pm 4.08	20.72 \pm 2.10	18.36 \pm 3.35	14.45 \pm 3.908
	F	$F=0.768$	$F=0.370$	$F=1.306$	$F=1.060$	$F=0.874$
	P-value	$p=0.517$	$P=0.775$	$p=0.282$	$p=0.374$	$p=0.460$

(Continued)

Table 2 (Continued).

Variables	Values	Motivating Factors	Study Resources	Study Methods	Study Habits	Factors Negatively Affecting Exam Performance
Hours spent Studying per week	<2 hours	17.57 ± 5.56	30.57 ± 6.05	20.85 ± 2.34	18.57 ± 3.86	15.28 ± 3.14
	2–5	19.90 ± 3.64	32.65 ± 4.14	20.65 ± 2.27	18.50 ± 2.81	15.85 ± 2.85
	6–10	21.10 ± 2.31	32.40 ± 5.23	20.85 ± 1.98	20.35 ± 2.39	15.15 ± 3.36
	11+	20.22 ± 2.16	33.44 ± 2.78	21.00 ± 2.50	20.66 ± 3.35	12.33 ± 2.82
	F	F= 1.974	0.528	F= 0.060	F= 2.080	F= 2.794
	P-value	p= 0.129	0.665	p= 0.981	p= 0.114	p= 0.049*

Abbreviations: t, Independent Sample T-test; F, ANOVA; R 1, Resident level 1; R 2, Resident level 2; R 3, Resident level 3; R 4, Resident level 4.

Table 3 Association Between Demographic Characteristics and Study Habits

Variables		Hours Spent Studying (Mean _ SD)	Motivating Factors (Mean _ SD)	Study Resources (Mean _ SD)	Study Methods (Mean _ SD)	Study Habits (Mean _ SD)	Factors Negatively Affecting Exam Performance (Mean _ SD)
Sex	Male	6.34 ± 3.18	20.56 ± 2.51	33.30 ± 4.34	20.91 ± 2.04	20.39 ± 2.82	14.86 ± 2.92
	Female	6.51 ± 4.00	19.75 ± 3.92	31.81 ± 4.73	20.72 ± 2.26	18.90 ± 2.99	15.03 ± 3.45
	T-Test	−0.167	0.936	1.194	0.359	1.865	−0.182
	P-value	0.868	0.353	0.238	0.755	0.068	0.856
Current level in Residency	R-1	7.15 ± 4.75	19.53 ± 2.50	33.00 ± 4.18	20.00 ± 2.61	19.53 ± 2.93	14.92 ± 3.06
	R-2	5.06 ± 1.86	21.20 ± 2.85	33.13 ± 3.75	21.60 ± 2.19	20.46 ± 2.74	16.06 ± 2.91
	R-3	6.41 ± 3.67	19.94 ± 4.49	31.94 ± 5.94	20.76 ± 1.67	19.41 ± 2.98	14.35 ± 3.16
	R-4	7.54 ± 3.90	19.45 ± 3.20	31.54 ± 4.08	20.72 ± 2.10	18.36 ± 3.35	14.45 ± 3.90
	F	1.216	0.768	0.370	1.306	1.060	0.874
	P-value	0.313	0.517	0.775	0.282	0.374	0.460
Location of Residency	Riyadh	6.60 ± 3.68	20.07 ± 3.09	32.68 ± 4.45	20.95 ± 2.36	19.24 ± 3.21	14.73 ± 3.39
	Taif	6.00 ± 3.70	20.13 ± 4.30	31.73 ± 5.06	20.40 ± 1.45	20.26 ± 2.18	15.60 ± 2.69
	T-Test	0.548	−0.058	0.681	0.843	−1.354	−0.891
	P-value	0.586	0.954	0.499	0.403	0.261	0.377

studied for six hours or more per week scored higher on the study resources subtheme than those who studied for five hours or less per day, showing that they valued a wider variety of study materials (Table 2).

There were no statistically significant differences between sociodemographic variables and study parameters. (Table 3).

Discussion

In the present study, we assessed the factors influencing the study habits of psychiatry residents in the KSA. We observed no significant differences in study habits based on age, gender, having children, marital status, and this is consistent with a prior study conducted among general surgery residents.⁹

More than half of the residents studied for six or more hours per week, and residents in their final year spent even more time studying. Similar results were reported in a Canadian study, which found that residents spent more time studying in their final year than in previous years.¹⁰ However, the Canadian study found that more than 96% of final-year residents spent more than 10 hours per week studying, which is more than the number of study hours found in the current study of psychiatry residents in the KSA. In another study on surgical residents, a mean weekly study time of three and a half hours was reported.⁵ The current study demonstrated that female residents spent more time studying than male residents. In contrast, a study conducted on Saudi psychiatry residents had the opposite result.⁸

Consistent with previous findings, final board and promotion examinations were the most motivating factors among the residents.^{8,10} These findings suggest that, in addition to final board examinations, periodic examinations may be considered as a means of promoting the desire to study throughout the residency program. In addition, clinical evaluations should be performed every quarter.

The literature further highlights the importance of increasing efforts to guarantee adequate and relevant didactic sessions during residency programs.¹¹ While didactic lectures are a staple of medical education, it has been shown that lecture series do not provide advantages in terms of standardized examination scores or long-term practice behaviors.^{12,13}

Books, review material, and notes were considered the best resources for studying by the participants in this study. Despite the importance of research advancements, most study participants did not consider research articles to be a useful study resource. The limited use of research could indicate poor availability of current articles, an issue that has been raised in another study conducted in Saudi Arabia as well.⁸ The majority of the residents in the current study considered journal club activities to be useless, in contrast to a recent study, in which participation in journal club events was found to increase residents' confidence and competence, enhance their capacity to assess research papers and recognize clinical applications from published literature, and improve their evidence-based recommendations and ability to train employees on evidence-based medicine.¹⁴

Consistent with prior research, there were no significant differences in the study habits of men and women based on marital status or the presence of children.^{8,9}

More than two-thirds of the study participants strongly believed that on-call duties severely impact their academic performance, which has been reported in a previous study.⁸ Furthermore, previous studies have indicated that exhaustive clinical engagement is a risk factor for burnout, poor clinical productivity, decreased academic involvement, and unsatisfactory examination outcomes and achievement.⁸ A recent study on the prevalence of burnout among psychiatry physicians in the KSA revealed that burnout affects more than two-thirds of practicing physicians, including residents in training.⁷ A study on three medical and surgical residency programs in the KSA found that 50% of the residents worked between 60 and 79 hours per week and 30% worked more than 80 hours per week.¹⁵

Most residents felt that their residency training program did not effectively prepare them for the board examination by not providing protected study time, similar to findings reported in a study performed on urology residents in the KSA.¹⁶

In the current study, residents also reported that they preferred to study independently rather than in a group; this finding corroborates the result of a previous Saudi study performed on urology residents¹⁶ though is in contrast to an American study, which found a prevalent preference for group study in undergraduate medical students.¹⁷

The findings of our study highlighted several factors that were perceived to potentially negatively impact the academic performance of psychiatry residents in the KSA, including a lack of structured or protected study time, difficulty accessing research publications, unengaging journal club events, and inadequate examination preparation. To address these issues, we suggest that residency programs in the KSA aim to foster effective study habits among residents by offering regular discussion sessions, prioritizing instruction on using research papers in their studies, and making available a wide range of relevant publications. To ensure that journal club events are dynamic and engaging, residency programs should consider facilitating interactive discussions and providing opportunities for residents to apply the

knowledge they have acquired. By addressing these concerns, residency programs in the KSA can create an ideal learning environment and improve the training of psychiatry residents.

Our study was limited by its self-reported data collection design. Any study incorporating self-reported information is susceptible to recall bias, and self-reported ratings thus may not be trustworthy.

Conclusion

Our study is the first to investigate how Saudi psychiatrists study, with the finding that current psychiatry residents employ a combination of traditional and contemporary learning strategies. This information can help stakeholders to understand current training challenges, improve the quality of training for psychiatry residents, and create an ideal learning environment.

Ethical Approval and Consent to Participate

This research has been performed following the Declaration of Helsinki and approved by the institutional review board, Committee on Health Research Ethics, Deanship of Scientific Research, Qassim University, Institutional Review Board (IRB) number 22-07-06. This is a non-experimental study. All data was obtained from psychiatrists who voluntarily answered a questionnaire designed to be anonymous. Informed consent was obtained from each participant after clarification of the study characteristics and objectives that were described on the first page of the survey.

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Disclosure

The author declares that there are no financial or other types of conflicts of interest related to the submitted article.

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