

COMPARISON OF LEARNING STYLES AMONG POST GRADUATE RESIDENTS AND FULL TIME SPECIALTY CLINICIANS PURSUING HIGHER EDUCATIONAL DEGREE

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ABSTRACT

Objective: To compare the different learning style preferences among full time specialty clinicians and post graduate residents.

Study Design: Comparative - cross sectional study.

Place and Duration of Study: Lahore medical and dental college Lahore, from Jan 2018 to Jun 2018.

Material and Methods: Participants were recruited through sampling. Informed consent was obtained. Participants were divided into two groups; post graduate residents and full time specialty clinicians currently enrolled in a higher education degree program. Self administered questionnaire including basic demographic data and Honey and Mumford learning style questionnaire was distributed. Data was analyzed using SPSS version 22.

Results: There were 70 participants, 40 residents and 30 consultants. Mean age \pm SD for consultants was 46.53 ± 7.02 and 27.63 ± 7.02 for residents. There were 45 males and 25 females. Average weekly study hours for consultants was 12.67 hrs and for residents 11.13 hrs ($p=0.741$). 96.7% consultants while 75.7% residents used internet. Self study was utilized by 90% consultants and 62.25% ($p=0.009$) of residents. All consultants managed time by scheduling, time anagement, weekends, late nights, leaves, early mornings and peer assisted. 72.5% of residents did not use any strategy for time. Majority of both groups had more than one learning style. Learning style combination of consultant was Reflector theorist (56.7%), reflector pragmatist (16.7%), activist pragmatist (10%) and activist reflector (13.3%) while learning style combination of residents was activist theorist and activist reflector 22.5% each, reflector theorist 27.5% and reflector pragmatist 12.5% ($p=0.023$).

Conclusion: Consultants had a much better learning style and better time management strategies for improved learning.

Keywords: Health care providers, Health professions, Learning styles, Medical education, Professional education.

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INTRODUCTION

Every person has a different learning style and people learn better if the instruction method suits their style. There are many established and validated scales and classification systems for learning style assessment. These learning style assessment tools have been validated in literature and the most widely used are the Kolb's, Gardner's, Learning style inventory VARK (visual, auditory, reading, kinesthetic) and Honey and Mumford classification^{1,2}. Honey and Mumford classification divides the learning styles into Theorist, activist, reflector and pragmatist. Acti-

vist learns well in new environments with activities and variety. Reflector learns well when opportunity to reflection and thinking is provided to them. Pragmatists learn well when they can apply their knowledge in practical life. Theorist learns well when they are able to generate and create ideas¹⁻⁶.

Learning styles and teaching methodologies have a direct relationship and affects learning. In medical education learning styles have been extensively studied especially among the under graduate students followed by post graduate residents³. There are many studies comparing the learning styles of different undergraduate and post graduate students⁴. As medical education is a continuous and evolving field, and medical professionals pursue higher educational qualifi-

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cations even after attaining a post graduate degree, there is a need to learn about their learning styles. Many of them are full time clinicians and it requires an extremely practical and useful learning style for them in order to achieve new qualifications. There are time constraints, other social, academic and professional obligations in addition to the study program in which they are enrolled. There are few studies addressing the learning styles of these professionals. Majority of the studies in this category are of faculty of teaching hospitals^{5,6}. We need to identify the learning styles of these full time clinicians enrolled for any post graduate programs and compare them to regular post graduate residents for their learning styles. They have markedly different responsibilities and commitments. The post graduate residents although mature enough have dedicated time for the post graduate training with few distractions in comparison to full time clinicians whom are simultaneously busy in their profession day and night.

It has been documented in literature that majority of the residents have a converging and assimilating type of learning styles based on Kolb's classification⁷. These learning styles are consistent with higher and deep learning. Better learning styles have an association with better performance in assessments and examinations and leads to academic achievements⁸⁻¹⁰. There are gender differences¹¹ in learning styles within the same group. Cultural¹² and environmental¹³ differences are also considered responsible for differences in learning style among students pursuing the same program. Learning styles of faculty⁵⁻⁷ has also been studied but the learning styles of full time clinicians has not been studied extensively. In a study by Linarez⁷ it was shown that there is no significant difference in the learning styles of faculty and residents in a post graduate Allied health professional program. Other studies have shown similar learning styles of faculty and post graduate residents with the faculty in larger percentages for much mature learning styles^{5,6}. Little is known about the learning styles of full time clinicians pursuing a higher qualification,

keeping in view their commitments and time constraints. It needs to be worked out how they achieve higher professional qualifications despite their busy professional schedule and little dedicated time available for studies. Their learning styles might be of great help for others because they usually produce good results in little available time. Their learning methodologies might definitely be superior in terms of application. A literature gap exists for this particular type of adult learner. Our study would help identify the learning style preferences among full time clinicians and compare them with post graduate residents considered to be adult and good learners. It would help to identify the skills and styles necessary to achieve good results in limited time and steps can be taken to inculcate them at all levels of learning in medical education and curriculum. The results would help in designing different instructional strategies and assessments for each category based on their learning styles and help improve learning in each case. It would help in revision of curriculum for each study group based on their learning styles, their time constraints and output requirements. It will also help individual learners from each group to evolve their learning styles, best suited to their educational requirements.

The objective of this study was to identify and compare the different learning styles among post graduate residents and full time specialty consultants pursuing a further higher degree program.

PATIENTS AND METHODS

The study design was comparative - cross sectional. The study was based on post positivist assumption.

Settings and Participants

Study was carried out at Lahore medical and dental college for group-A and multi centre for group-B. Participants were divided into two groups, group-A; post graduate residents were selected from different resident programs of Lahore medical and dental college. Group-B participants, full time specialty clinicians currently

enrolled in a higher education degree program, were selected through non probability consecutive sampling from different areas of Pakistan.

Data Collection Instrument

Quantitative data collection in this study was gathered by using the self administered 80 item Honey and Mumford learning style questionnaire to the participants, scores were calculated and different learning styles and preferences were categorized into Activist, theorist, Pragmatist and reflector. Participants were categorized into combination learning styles based on their high preference score in the top two out of four styles.

In addition basic demographic data was collected including age, gender, experience, specialty, city, hours of study per day and time management strategies etc on a separate proforma.

Group A participants included residents of different specialties undergoing training in Lahore medical and dental college. Group B participants included full time specialty clinicians pursuing a simultaneous higher education degree program from all over Pakistan. Informed written consent was taken from the participants before data collection.

Questionnaires were distributed by hand, through mail and emails, participants were given one week to respond via mail, while hand distributed questionnaires were filled on spot by the participants. Participants were guided about how to fill the questionnaires. Participants were sent a follow up reminder mail/email after completion of one week and a second reminder after two weeks of completion of deadlines. Non compliant participants were also contacted on telephone for follow-ups. Completed questionnaires were scrutinized and incompletely filled forms removed from the data.

Working Specialty Clinicians: Clinicians having a higher post graduate degree in their respective field with a minimum three years experience and working as full time in public/private hospital/clinical settings including evenings.

Post graduate Medical Students: Medical doctors actively pursuing and enrolled in post graduate degree programs after their basic medical qualification.

Data was analyzed using SPSS version 22. Mean and standard deviation were calculated for continuous variables like age, experience and hours of study per day. Frequency and percentage were calculated for the categorical variables like learning styles, gender and specialty. Chi Square test was used to compare the frequency of different learning styles among postgraduate residents and full time specialty clinicians. Multinomial Logistic Regression was used to determine the effect of various independent factors like age, gender, clinical specialty, experience and study hours per day on learning styles. The *p*-value ≤ 0.05 considered significant.

RESULTS

There were 70 participants, out of which 40 (57%) residents and 30 (43%) consultants. Mean \pm SD age for specialist was 46.53 ± 7.02 while mean \pm SD age for resident was 27.63 ± 2.07 . There were 45 males (64.3%) and 25 females (35.7%). All the residents were from Lahore medical and dental college and the consultants belonged to different institutes throughout the country. Twelve residents (30%) were from first year, 17 from second year (42.5%), 9 (22.5%) from third year and 2 (5%) from 4th year of training in different specialties. The average weekly study hours for consultants was 12.67 hrs and for residents 11.13 ($p=0.741$). Eighty percent consultants learned by books while 85% of residents used books for learning ($p=0.06$). 96.7% consultants used internet while 75.7% residents used it for learning ($p=0.019$) as shown in table-I. Articles were read by 70% consultants while 64.9% residents read articles ($p=0.429$). 66.7% consultants used discussion for learning while 54.1% used it for their learning ($p=0.213$). Self study was utilized by 90% of consultants while only 62.25 of residents used it ($p=0.009$). Multisource learning was used by 80% of consultants and 85% of residents ($p=0.026$). All the consultants employed different strategies to

manage time for learning including scheduling, time management, week-ends, late nights, leaves,

Table-I: Learning methodologies used by consultants and resident.

Learning methodologies	Consultants n (%)	Residents n (%)	p-value
Books	24 (80)	34 (85)	0.065
Internet	29 (96.7)	30 (75.7)	0.016
Articles	21 (70)	26 (64.9)	0.429
Discussion	20 (66.7)	21 (54.1)	0.213
Self Study	27 (90)	25 (62.2)	0.009
Multi Source	24 (80)	22 (55)	0.026

Table-II: Different learning management strategies used by consultants and residents.

Managing study	Consultants n (%)	Residents n (%)	p-value
Scheduling	3 (10)	1 (2.5)	<0.005
Time management	10 (33)	-	
Weekends	5 (16.7)	-	
Late nights	4 (13.3)	-	
Peer assisted learning	1 (3.3)	2 (5)	
Nothing special	22 (72.5)	-	
Videos	0 (0)	4 (10)	
Leaves	2 (6.7)	-	
Learning by doing	1 (3.3)	3 (7.5)	
Self learning	2 (6.7)	1 (2.5)	
Early morning	1 (3.3)	-	

Table-III: Learning style combinations among consultants and residents.

Learning style combination	Consultant n (%)	Resident (%)	p-value
Reflector theorist	17 (56.7)	11 (27.5)	0.023
Theorist pragmatist	1 (3.3)	4 (10)	
Reflector pragmatist	5 (16.7)	5 (12.5)	
Activist pragmatist	3 (10)	2 (5)	
Activist reflector	4 (13.3)	9 (22.5)	
Activist theorist	-	9 (22.5)	

early mornings, peer assisted etc while 72.5% of residents did not have any special methodology to manage for their learning ($p<0.01$) as shown in

table-II. Majority of both groups had more than one preferred learning style (2-3) learning style combination of consultant was Reflector theorist (56.7%), reflector pragmatist (16.7%), activist pragmatist (10%) and activist reflector (13.3%) while learning style combination of residents was activist theorist and activist reflector 22.5% each, reflector theorist 27.5% and reflector pragmatist 12.5%, $p=0.023$ (table-III). The mean scores in different learning styles preferences among consultants and residents were more towards activist in residents compared to consultants (11.78 vs. 8.73). 47.5% residents had very strong preference for activist learning style while 43.3% of consultants had moderate preference for activist style ($p=0.004$). 70% consultants had strong preference for reflector learning style while 47.5% residents had the same ($p=0.03$). Pragmatist learning style strong preferences were in 43.35 consultants and 20% of residents ($p=0.015$) as shown in table-IV.

DISCUSSION

This study compared the learning styles of post graduate residents enrolled in different specialty trainings with full time specialty clinicians following another higher educational degree. The learning styles are categorized into Activist, theorist, pragmatist and reflector based on Honey and Mumford classification. The theory behind this research is Androgogy and experiential learning theory of Kolb's and Honey and Mumford that assumes how adults learn¹. Androgogy originated in Europe in 1950's and was developed as a model in 1970 by Knowles who defined it as the art and science of helping adults learn¹⁰⁻¹⁴. It was used to study the adult learners approach and styles. This theory indicates that adult learners are different and different teaching methodologies can be used for them. Because of the different objectives, motivation and time constraints the working clinicians resort to approaches that best suit their time constraints based on their experience and previous learning style outcomes. Learning styles and preferences vary among different professional levels. With advancing professional careers, more experience and tight professional schedules,

learning styles of full time specialty clinicians evolve to more deep and rapid learning compared to post graduate residents who have dedicated time for learning. On the basis of their previous academic achievements and learning styles they are actually good and deep learners but at this stage of their career unlike the past they don't have the luxury of time and having multiple tasks simultaneously.

Both groups had comparable average weekly study hours although individual variations existed. Both groups majority used books as a main source of learning however internet use for learning was significantly more in the consultant group. Consultants used to read more articles and do discussions compared to residents to

than one learning style preferences. These finding of nurse practitioners were similar to learning styles of consultants in our study that was Reflector theorist combination in the majority followed by Pragmatist.

A longitudinal study on first and final year nursing students learning style found that the preferred learning style among students in their first (69%) and final year (57%) was reflector style¹⁷. Total scores of all learning styles showed significant improvement across the two points of time.

A study conducted at Ayub medical college 4th year students assessed learning styles of students and correlated it with preferred teaching methodology¹⁸. They found no significant corre-

Table-IV: Learning style preferences among consultants and residents.

		Very low preference	Moderate preference	Strong preference	Very strong preference	Low preference	p-value
Theorist	Consultant	10%	26.7%	33.3%	20%	10%	0.574
	Resident	2.5%	32.5%	32.5%	27.5%	5%	
Reflector	Consultant	3.3%	3.3%	70%	6.7%	16.7%	0.027
	Resident	0%	15%	47.5%	27.5%	10%	
Activist	Consultant	3.3%	13.3%	10%	30%	43.3%	0.004
	Resident	-	15%	47.5%	10%	27.5%	
Pragmatist	Consultant	10%	23.3%	43.3%	0%	23.3%	0.015
	Resident	5.7%	34.3%	30%	7.1%	22.9%	

improve their learning. Self study and self directed learning was main tool used by consultants in 90% of the cases while only 62% of residents utilized self directed learning. This is a significant difference between learning strategies differences among the two groups.

Reflector was a preferred learning style among nursing undergraduate students in a study by Rasool *et al*¹⁵. A study comparing learning styles of orthopedic residents and faculty members found converging (pragmatist) style as the preferred one among both faculty and residents. It included problem solving, decision making and practical application of ideas. Another study on orthopedic first year resident showed similar results of 53% converging style among them. Reflector and theorist learning style were preferred styles among Macmillon clinical nurse practitioners¹⁶ followed by pragmatist as more

relation between the learning style and the preferred teaching methodology but the learning style was in majority reflector and pragmatist which is against our study findings in which Activist was the preferred style. The possible reason could be that majority of our residents were from different specialties of dentistry which is a practical and procedure oriented specialty and hence those joining it already have an activist type of preference for the subject.

A similar study by Shukr I *et al*² for learning style preferences using Honey and Mumford classification, comparing undergraduate medical students with post graduate residents found that preferences for all four learning styles were present in both the groups similar to our study. There was statistically significant difference among the groups in activist and reflector styles of learning similar to our study but they were

comparing students to post graduate residents and in our study postgraduate residents were compared with full time specialty consultants. In that case there is a difference in learning styles of compared post graduate residents in both studies. They had a preference of 38% reflector and 35% theorist while in our study postgraduate residents had a reflector and activist preference followed by theorist and pragmatist. A similar study on UK GPs showed a preferred learning style combination of reflector-theorist in the majority¹⁹⁻²⁰.

Time management strategies were more effectively utilized by the consultants to improve their learning despite their busy schedules. Majority (72%) of the residents did not bother to use any special methodology to manage time for their studies. The time management strategies employed by the consultant included scheduling, utilizing early mornings and late nights, availing leaves for studies and peer assisted learning. This shows that consultants are more strategic learners.

The mean scores of different learning styles among consultants and residents were significantly different. The residents had more inclination towards activists learning style than consultants. Similarly 70% consultants had a strong preference for reflector learning style compared to 47.5% of residents. Consultants were more pragmatist than residents.

Comparing the mean scores for different learning styles among the two groups doesn't show any significant difference but when we compare the difference by dividing each learning style score into moderate, strong, very strong, low and very low preferences as per Honey and Mumford classification and cross tabulate the strength of learning styles among the two groups then there is a significant difference between the groups in reflector, activist and pragmatist domains ($p=0.027$, 0.004 , 0.015) respectively (table-IV). There is no significant difference in the theorist domain of the learning style ($p=0.574$) (table-V). This shows that residents and consultants

have similar preference for theorist learning style but the difference arises in reflector and pragmatist preference which is predominant in consultants while activist preference is preferred style in the residents.

One interesting finding in this study was that in both the groups the learning style preferences were labeled with the highest preferences in the top two domains of learning style for grouping purpose as per literature review available on Honey and Mumford classification. But in a significant number of study participants there was a third learning style preference as well in the majority of the cases. This proves the dynamic learning styles in both groups. This is in contrast with a study conducted on general physicians in Hong Kong¹⁹ on a distant learning program of 18 weeks. Majority of the participants had a single preferred learning style (71%) and out of that 32% had a reflective learning style. The difference can be due to the sample of young GPs while in our group there were post graduate specialty residents and consultants and there can be a difference in learning styles among them due to their study environments, requirements, teaching methodologies, competencies required and assessments. Secondly the GPs in the study were young early career with little experience.

Strengths of Study

It was an important study from Pakistan comparing the learning styles preferences between post graduate residents and full time practicing specialty clinicians pursuing a higher educational degree.

LIMITATIONS OF STUDY

Small Sample Size

Use of 80 item Honey and Mumford Learning style questionnaire was too exhaustive and tricky for participants to understand and fill properly.

Implications

These results can be used to modify instructional strategies and learning environ-

ments for different post graduate medical programs for better learning.

With ever increasing knowledge in medical sciences, reflective and pragmatist approach needs to be developed in our residents.

The question remains to be answered is whether learning styles change over time? And how we can inculcate such a change? More research is needed in this domain.

CONCLUSION

The learning styles and time management strategies of specialty consultants are superior to postgraduate students. Reflector, theorist, pragmatist was the predominant learning style of consultants while Activist, theorist was the predominant learning style of post graduate residents

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Authors Contribution

Dr Sahibzada Nasir Mansoor: Research idea, study design, questionnaire development, data management, writing first draft.

Dr Omer Yousaf: Data collection, data analysis, literature search and review, improving the draft, final approval.

Dr Sahibzada Salma Rahman: Data collection, data analysis, improving the manuscript, literature review, final approval.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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