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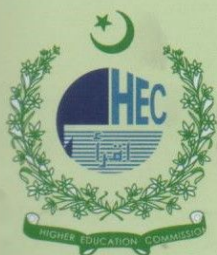
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Editorial

REDUCTION IN OPERATING ROOM TURNOVER TIME IS A SUCCESSFUL STRATEGY TO IMPROVE THE EFFICACY OF THE HEALTH CARE SYSTEM

Fareha Iram Khosa¹, Anam Parvaiz²

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Operating room (OR) turnover time (TOT), is stated as the time between one patient leaving the operating room to the next patient entering the OR so that surgery can be commenced.¹ This time is utilized by the workers to do certain necessary duties such as; tidying the room, collecting equipment and making sure, availability of sterile equipment and ready that room for the subsequent surgery and finally, escorting the patient from the preoperative area to the operating room.² The efficient use of this turnover time will lead to the smooth running of the hospital while the inefficient use of this time can cause not only economical losses for the hospital but also a lack of provision of quality care to the patient.³

Turnover time, therefore is, one way to assess the healthcare system's efficiency, hence, it is pivotal for the health administration. Various factors are involved in the OR turnover time such as measuring this time, teamwork, procedures, personnel skills, workflow layout, etc. The common objection of surgeons regarding turnover time is the waiting time to perform surgery, the actual operating time is less than 50% for an average surgery day. This in turn can lead to increased staffing costs, loss of potential revenue generation, and patient dissatisfaction. A chief cause of prolonged turnover time is the misaligned objectives of the pertinent stakeholders.⁴

Various advances have demonstrated radical developments in operating room turnover time. The application of the Lean process led to the recognition of crucial areas that aided in the improvement of the operating room turnover time. The detection of such a process led the anesthesiologist to see the next patient at an earlier time and commence the patient's intravenous line and consent-taking. A workflow matter was discovered with the circulator and subsequently, redundant travel time to salvage supplies was eliminated, by arranging the case cart for that day with the mandatory supplies. By involving the stakeholders in the Lean process, the median operating turnover time was reduced from 37 to 14 min, leading to a reservation of 70 minutes of operating time and revenue generation of approximately \$19,500 daily.⁵ Additionally, an important element of operating room turnover time is the accessibility of the post-anesthesia care unit (PACU) to recuperate. If the PACU does not have sufficient staff or beds accessible to accept a patient, the patient may be kept in the operating room for an additional period. Planning and mitigating the time duration of the operations is significant for operating room productivity, moreover, forecasting the length of time required in the PACU for each surgical procedure is indispensable. In a research project, the use of a machine learning algorithm to forecast the PACU time for each kind of procedure was capable of decreasing the total PACU holding time by 76%, resulting in noteworthy economical benefits.⁶

¹Senior consultant anaesthesia and HOD, Indus Hospital Raiwind Campus Lahore.

²OT Supervisor, Indus Hospital Raiwind Campus Lahore.

To enhance the operating room turnover time, it is crucial to include all the pertinent stakeholders, alignment of the appropriate goals, and eradicate the tasks which lead to waste of resources i.e., both material and manpower resources.

An important factor that can adversely affect the turnover time is inadequate staffing i.e., surgeons, anesthesiologists, and nurses, thus causing disorder and postponements.⁷ The World Health Organization has developed a checklist that is intended to enhance operating room teamwork, yet, even with the checklist being applied there were all the same, letdowns in the teamwork.⁸ The recommendations for improving holdover time include, assigning an OR coordinator, sufficient OR staff, training of housekeeping staff to work efficiently, use of well-equipped cleaning carts, keeping sufficient stock of all relevant equipment and supplies, training sessions for PACU nurses to smooth management of patients flow from OR to PACU and subsequently, ward; implementation of all these steps can lead to a reduction of turnover time from 50-60 minutes to 20-25 minutes respectively.

AUTHOR'S CONTRIBUTION

FIK: Conception

AP: Literature survey

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Original Article

BURNOUT SYNDROME AMONG THE HEALTH CARE PROFESSIONALS IN MEDICAL AND SURGICAL WARD IN COVID-19 PANDEMIC; A CROSS-SECTIONAL STUDY OF PESHAWAR

Rubeena Gul¹, Ammar Ahmad², Ismail Alam³, Saima Aleem⁴, Aziza Alam⁵, Salahuddin Zeb khan⁶, Aimeen Zeb Khan⁷

ABSTRACT

Background: To determine the frequency and causes of Burnout Syndrome (BOS), among the healthcare professionals in medical and surgical wards in Hayatabad Medical Complex (HMC), Peshawar.

Material and Methods: A self-administered survey was conducted in the General Medicine and Surgical wards in HMC, Peshawar, Pakistan. The on-duty doctors and nurses of the concerned department who consented, were included. Maslach Burnout Inventory for Medical Personnel (MBI-HSS) was used for data collection. SPSS version 24 was used for data analysis.

Result: A total of 300 questionnaires were distributed and they were requested to return them after filling them to the registrar's office. According to the study results, most participants (90%) showed high depersonalization (DP) levels and 91.7% of participants showed professional achievement (PA) levels high and 45.8% of respondents indicated moderate emotional exhaustion (EE) levels. The overall burnout level among the health care professional was present at moderate intensity. Working hours ($p < 0.002$) and working patterns ($p < 0.003$) had a significant association with burnout syndrome.

Conclusion: The overall burnout level among the study participants (83.7%) was moderate along with high PA and DP levels whereas EE level come out moderate.

Keys Words: Burnout, COVID-19, Questionnaires

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INTRODUCTION

The recent Covid-19 pandemic has generated the concept of a “new normal” while disrupting the traditional notion of general human logic of normal life regarding all aspects of life especially economics, education and physical and mental health.¹⁻³

The drastic health impact and eventfulness of this pandemic as new normality increased the vulnerability of healthcare professionals to psychological distress including burnout which was prevalent even before this pandemic.⁴⁻⁶

Burnout, among health professionals, is attributed to work-related stress and job dissatisfaction which is very common among healthcare workers.^{7,8} Categorized as a prominent psychological problem, it is an amalgamation of emotional exhaustion (EE), depersonalization (DP) and reduced professional achievement (PA) as shown in figure-1 and leads to adverse social and mental health outcomes in healthcare

¹Associate Professor Community Medicine, Khyber Medical College, Peshawar.

²Masters in Public Health Scholar, Dubai, UAE.

³Assistant Professor, Department of Medical Education, Rehman College of Dentistry, Peshawar.

⁴Senior Research Fellow, Office of Research Innovation and Commercialization, Khyber Medical University, Peshawar.

⁵Demonstrator, Community Medicine, Khyber Medical College

^{6,7}Rehman College of Dentistry

providers.⁹ Emotional exhaustion is characterized by a lack of occupational motivation and feeling depleted resulting from overly-strenuous workload, whereas depersonalization and personal achievement are more related to emotional detachment and an individual's dissatisfaction with own achievements respectively.¹⁰

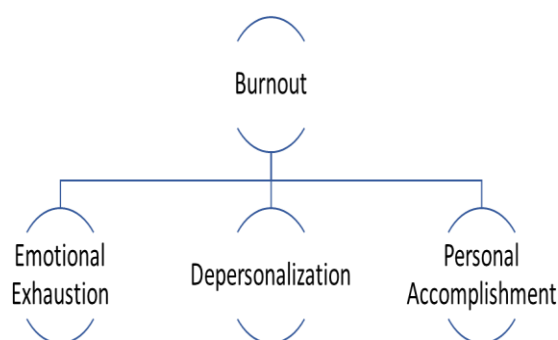


Figure 1: Burnout Model

Although burnout affects individuals irrespective of their age and gender but additional factors including workplace, working hours, experience, lack of participation in active decision-making, and work patterns have been significantly associated with it¹¹ resulting in compromised quality of life.¹² In recent times, The Maslach Burnout Inventory (MBI), a psychometric tool, is used for the burnout assessment encompassing all three domains i.e., EE, DP, and PA effectively.¹³⁻¹⁶ and for health professionals, the Maslach Burnout Inventory for Medical Personnel (MBI-HSS-MP) is widely used.¹⁷ This tool, in the local context has been previously used in research¹⁸ in Pakistan.

In the context of Pakistan, there still is a scarcity of literature regarding burnout syndrome among healthcare professionals. Considering the grave consequences of this syndrome, and the implications it holds for the quality of the health workforce and care, the aim of this study is not only to cover the

literature gap but to assess the magnitude of the problem as well. This study attempted to evaluate the magnitude of burnout and to assess all three dimensions among the doctors and nurses in a tertiary-level public sector hospital.

MATERIAL AND METHODS

The study was performed by the code of ethics of the World Medical Association (Declaration of Helsinki)

A cross-sectional study was conducted from September 2020 to February 2021, among the doctors and nursing staff working in Hayatabad Medical Complex (HMC) which is the 2nd largest public teaching hospital in Peshawar.

A total of 300 randomly selected participants were included in this study and subjected to written informed consent. The sample was calculated using open software keeping a 95% confidence level, 5% margin of error, and anticipated frequency of burnout among health professionals as 75%, the calculated sample size was 289 but to avoid non-response the sample was increased to 300.

A self-administered validated questionnaire was used for data collection and to ensure the confidentiality of the participants the filled questionnaires were collected in a sealed box kept at the reception of the ward for three days.

The data collection tool comprised two sections. Section 1 comprised of items about socio-demographic details and section 2 comprised 22 items derived from the Maslach Burnout Inventory (MBI) for medical personnel (MBI-HSS MP) to assess three domains of burnout. Among the 22 items meant for the assessment of three domains of burnout, 8 items were for emotional exhaustion (EE) assessment, 6 items for depersonalization (DP), and 8 items for personal accomplishment (PA) based on Likert scale ranging from '0' being 'Never' to '5' being 'Everyday'. Table 1 presents the cut-offs for each domain of MBI.

Table 1: Cut-offs value of the three dimensions of MBI-HSS scores.

	Low	Moderate	High
Emotional exhaustion (EE) (8 items)	<14	15-24	> 25
Depersonalization (DP) (6 items)	<3	4-9	> 10
Personal accomplishment (PA) (8 items)	>40	33-39	<32

The data was analyzed using SPSS version 22. The data was checked thoroughly for any missing entries. By using the formula ($TBO = EE + DP - PA$), the total burnout score was calculated and categorized. Continuous variables were presented as mean and standard deviation, frequencies, and percentages were calculated for categorical variables. To verify an association between the qualitative variables, a chi-square test was applied and $p < 0.05$ was considered statistically significant.

RESULTS

Of the total 300 participants, 44.2% ($n=133$) were from the medical ward and 55.6% ($n=167$) were from the surgical ward including 59.3% ($n=178$) males and 40.7% ($n=122$) females. The mean age of the participants was 28.7 ± 1.69 years. The participants consisted of 89 nurses (29.6%), while 211 (70.3%) were doctors. In terms of work experience, 36.2% ($n=109$) were working for less than one year, 42.9% ($n=132$) for 1-4 years, 14% ($n=42$) for 4-10 years, while only 5.6% ($n=17$) were working

for more than 10 years. Bachelor's level of education was acquired by 165 (54.5%) participants, followed by specialist and master levels by 99 (32.9%) and 36 (12%) participants respectively.

The working pattern of the participants showed that 33.3% participants worked during the day, 27% worked on the night shift and 57.1% were working on a rotation basis; 65.7% worked 50-60 hours/week, whereas 21.9% worked 60-80 hours/week and 13.6% participants work more than 80 hours/week. Table 2 presents the frequency and percentage distribution across all three domains of burnout.

Table 2: Participants' Emotional Exhaustion, Depersonalization, And Low Personal Accomplishment Distribution

	Low	Moderate	High	Mean SD
Emotional exhaustion	57 (18.9%)	138 (45.8%)	105 (34.9%)	21.26 ± 7.96
Depersonalization	5 (1.7%)	57 (18.9%)	238 (79.1%)	13.98 ± 4.88
Personal accomplishment	24 (8.0%)	96 (31.9%)	180 (59.8%)	30.94 ± 6.83
Composite burnout	40 (13.3%)	252 (83.7%)	8 (2.7%)	4.65 ± 13.31

The overall burnout had no statistically significant association with the department, job title, gender, years of experience, level of education, or age ($p > 0.05$). However, there was a statistically significant association between burnout levels with working patterns (p -value < 0.003) and working hours/week ($p < 0.002$).

Table 3: Association between Study Variables and Burnout

	High n (%)	Moderate n (%)	Low n (%)	Total	p-value
Department					
General medicine	5(3.75%)	106(79.6%)	22(16.5%)	133	0.179
Surgical	3(1.8%)	146 (87.4%)	18(10.7%)	167	
Job title					
Doctor	5(2.3%)	180(84.9%)	27(12.7%)	212	0.770
Nurse	3(3.4%)	72(81.8 %)	13(14.7%)	88	
Gender					
male	6(3.4%)	153(86.0%)	19(10.7%)	178	0.189
Female	2(1.6%)	99(81.1%)	21(17.2%)	122	

Years of Experience					
less < year years	3(2.8%)	92(84.4%)	14(12.8%)	109	0.902
1-4 years	4(3.0%)	112(84.4%)	16(12.1%)	132	
>4-10 years	1(2.4%)	35(83.3%)	6(14.3%)	42	
>than 10 years	0(0.0%)	13(76.5%)	4(23.5%)	17	
Level of education					
Bachelor level	4(2.4%)	140(84.4%)	21(12.7%)	165	0.552
Specialist level	3(3.0%)	85(85.9%)	11(11.1%)	99	
Master level	1(2.8%)	27(75%)	8(22.2%)	36	
Age					
18-29 years	6(3.0%)	171(84.7%)	25(12.4%)	202	0.395
30-39 years	1(1.2%)	73(84.9%)	112(14.0%)	86	
40-49 years	1(8.3%)	8(66.7%)	3(23.3%)	12	
Working pattern					
day time	0(0.0%)	76(75.0%)	24(24.0%)	100	0.003
Night	2(7.4%)	24(88.9%)	1(3.7%)	27	
Shift	6(3.5%)	151(87.8%)	15(8.7%)	172	
Working hours/week					
50-60 hours	3(1.5%)	160(83.7%)	28(14.6%)	191	0.002
61-80 hours	3(4.5%)	54(81.8%)	9(13.6%)	66	
> 80 hours	1(2.32%)	37(90.2%)	3(7.31%)	41(100%)	

DISCUSSION

The key findings of this study were a statistically significant association between burnout with the working pattern and working hours/week among healthcare professionals working in medical and surgical departments. Overall low burnout levels were in 13.3% of participants, 83.7% had moderate level burnout and only 2.7% of participants had a high level of burnout. These findings are consistent with the results reported by another similar study.¹⁹

The study holds significance as it was conducted during the time of the Covid-19 pandemic and a recently conducted review reported the emotional turmoil, increased posttraumatic stress, and burnout among healthcare professionals, and few studies used the MBI as a tool of assessment. Burnout, across the globe, is a well-established phenomenon and literature does establish the MBI as a credible tool for the said purpose. According to the current study's findings, about half of the participants had moderate to high-level EE, which was similar to the findings of a study conducted by other researchers.^{20,21} In a similar Iranian study, the average emotional exhaustion was reported

to be 17.19 whereas the average score reported by our study was 21.26.²²

High DP levels of the study participants as compared to EE levels were recorded by our study. Study results found that 79.1% of healthcare workers were highly depersonalized, 18.9% were in the moderate category and only 1.7% of study samples had low depersonalization levels. Although, comparison with previous studies' results such as Hague and Pop and Selmanovic et al. 2011 highlights the low level of depersonalization levels among healthcare workers.²¹

High levels of lack of personal accomplishment were reported by 59.8% of healthcare professionals. The study results are comparable with the previous studies projected on burnout syndrome; this study's frequencies of PA are showing contrast with those such as Adeneka et al. 2008²³ which has shown 36% to 38% PA levels among the study participants while Selmanovic et al. 2011(21) showed 50.3%.

The mean scores for the three burnout domains in our study were 21.26 $\pm$ 7.96 for EE, 13.98 $\pm$ 4.88 for DP and 30.94 $\pm$ 6.83 for PA. as per the findings of another study conducted among healthcare providers, the mean scores ($\pm$ SD) in emotional exhaustion,

depersonalization and personal accomplishment subscales were 8.9 (± 9.0), 23 (± 2.9), and 34 (± 8.6), respectively²⁴ while another similar study reported higher values as 26.6 (± 7.4), 10.2 (± 2.2), and 27.3 (± 3.9), respectively for EE, DP and PA.²⁵

Our study found no significant association between gender and age with burnout syndrome whereas several similar studies reported the opposite of our findings.²⁶⁻²⁸ Additionally, another socio-demographic factor is job title which consisted of doctors' and nurses. Our study results showed almost similar frequencies for both specialties and found a significant relationship between job titles with all three dimensions and total burnout.

Previous articles presented different results of three dimensions of burnout with career-related aspects for physicians at the start of their careers were affected by high depersonalization while in the middle of their careers they suffered from emotional exhaustion.²⁹ Although, further studies reviewed in a systematic review state that occupational burn out decreases with the increase of medical professionalism.³⁰

CONCLUSION

The current study has generated clear evidence regarding burnout among healthcare professionals and the association between different constructs. Despite being conducted on a limited level, the study does highlight the factors to be considered to design effective strategies to help health care professional (HCP) overcome burnout to improve both personal and professional quality of life.

AUTHOR'S CONTRIBUTION

RG: Concept, Design, and proofreading

AA: Acquisition and critical review

IA: Analysis and interpretation of data

SA: Drafting of the first and final draft of the manuscript, submission and correspondence

AA: Data collection and final approval

SZK: Literature Search and data enter

AZK: Data Entry, writing of result section

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Original Article

EFFICACY OF MICRO NEEDLING IN PATIENTS WITH POST-ACNE SCARRING

Ammara Azeem¹, Sameena Khan², Uzma Ahsan³

ABSTRACT

Background: Multiple minimally invasive sessions of skin micro-needling are an effective treatment for post-acne scars as it stimulates the repair processes with the advantage of being a relatively risk-free, in-office procedure with minimal patient recovery time. The study aimed to determine the efficacy of micro-needling for the treatment of patients with post-acne scars presenting to tertiary care hospitals.

Material and Methods: It was a Quasi-experimental study conducted at the Department of Dermatology, Sharif Medical City Hospital, Lahore. The study was carried out over a period of six months from 26-05-2019 to 25-11-2019. The sample size of 83 cases was calculated using a 95% confidence level, 10% margin of error and taking an expected percentage of effectiveness of micro-needling as 31%. Non-probability consecutive sampling was used.

Results: Patients ranged between 18-35 years of age. Patients with acne scars in grade 3 and grade 4 were enrolled in the study based on Goodman and Baron grading system. As regards baseline grades of acne scars, 45 patients (54.2%) were having grade III and 38 patients (45.8%) had grade IV acne scars. At the end of treatment, 40 patients (88.88%) having grade III scars showed improvement in their grades whereas 5 patients (11.11%) showed no improvement according to the set definition. There was a total of 38 patients (45.8%) presenting with grade IV acne scars of which 32 patients (84.21%) showed improvement by 2 grades whereas 6 patients (15.78%) did not meet the desired results.

Conclusion: The efficacy of micro-needling was found in 72 patients (86.7%).

Key Words: Acne vulgaris, Wound healing, Fibroblasts

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INTRODUCTION

Being the most commonly encountered skin disorder, Acne vulgaris needs prime consideration by dermatologists. It primarily affects teenagers; however, it may present at any age.¹ As per the definition, Acne is a multifactorial chronic inflammatory disease that affects pilosebaceous glands.

Underlying pathogenic mechanisms include increased production of sebum, follicular hyper-keratinization, and colonization by *Propionibacterium acne* with various products of inflammation. It may present as papules, pustules, seborrhea, comedones, and less frequent nodules or pseudocysts, ultimately leading to scar formation in about 95% of the cases.²

Being a psychologically distressing condition, Acne scarring creates a great challenge for the treating Dermatologist. The patient suffers from low self-esteem and is psychologically distressed as a result of these scars. So, an effective treatment will help them in improving physical as well as

¹Senior Registrar Department of Dermatology, Sharif Medical & Dental College, Lahore.

²Professor of Dermatology, Sharif Medical & Dental College, Lahore.

³Resident of Dermatology, Sharif Medical & Dental College, Lahore.

mental status.¹ Different treatment options are available for its management including but not limited to Chemical peels, Derma abrasion, Resurfacing, Acne fillers, electrodesiccation and collagen-induced therapy.³

Each treatment option carries its limitations and has its pros and cons. Microneedling had been introduced lately for treating such complications of acne. Controlled skin injury is produced by creating small punctures using microneedles without damaging the epidermis. As a result of this, there are small bleeding points seen, which create a healing cascade and release of growth factors needed for wound healing.^{4,5} Old scars are also broken down by the needle and allowed to revascularize. There is migration and multiplication of fibroblasts leading to new collagen synthesis and neovascularization. Within five days of the injury, a fibronectin matrix is formed that determines collagen deposition causing tightening of the skin which may last for five to seven years in the form of Collagen III.^{6,7}

It is cost-effective, handy equipment with ease of only having outpatient visits. The efficacy and safety of micro-needling are already established in multiple global studies including in Asian skin. This modality has recently been introduced locally but limited data is available. The literature has reported considerable variation in its effectiveness ranging from 31%-72.2%.^{4,5}

This study's objective is to determine the efficacy of this new modality in a psychologically disturbing complication of Acne Vulgaris, in patients presenting to the dermatology department of a teaching hospital. Thus, evidence will be generated to help dermatologists' decision-making regarding the use of micro-needling for the treatment to decrease the morbidities associated with post-acne scars.

MATERIAL AND METHODS

This Quasi-experimental study was carried out in the Dermatology Unit of Sharif

Medical and Dental College, Lahore, after soliciting ethical approval from the institutional research and ethic boards. A total of 83 patients with grade 3 and 4 atrophic facial scars selected according to the Goodman and Baron grading scale⁸, of both gender with Ages 18 to 35 years having a mean age of 27.0 ± 5.2 years were included in this study. WHO calculator was used for determining the sample size comprising 83 cases which were calculated using a 95% confidence level, 10% margin of error, and taking the expected percentage of effectiveness of micro-needling as 31%.¹ These patients have enrolled in the Dermatology Unit of Sharif Medical and Dental hospital over a period of six months. Exclusion of Patients was made with the tendency of having keloid scarring, history of recurrent herpes or active acne lesion (determined on clinical examination), and Patients with clotting disorders (deranged PT > 14sec and APTT > 33 sec). Patients taking anticoagulant or steroid therapy during the last 3 months (determined on history and medical record), uncontrolled diabetes, uncontrolled hypertension, and history of collagen vascular disease.

Informed consent was taken. Afterward, the patient's skin was cleansed with an alcohol swab, followed by the application of topical 10 % Lidocaine cream. Microneedling was carried out using Derma pen®. With slight pressure, it was rolled on the treatment area four times in all directions. The appearance of pinpoint bleeding points or mild erythema was considered an endpoint for the session. Post-procedure the patients were instructed to apply a topical anti-bacterial ointment and strictly advised sun protection. A total of three sessions were carried out each with an interval of one-month post-procedures photographs was taken after every session and their record was maintained on a pre-designed proforma. Patients were also inquired about any side effects after each session. Two-grade improvement was considered to be "effective" using Goodman and Baron grading scale.⁸ The confidentiality of the data was ensured.

The SPSS version of 17.0 was used for data entry and analysis. Frequencies were calculated for gender, base, and line acne grading. Mean $\pm$ SD was calculated for age, and duration of disease. Data were stratified for age, gender, duration of disease, and baseline acne grading. Post-stratification Chi-square test was applied by taking a p-value of ≤ 0.05 .

RESULTS

Patients having Grade III and Grade IV acne scars were enrolled in the study according to Goodman and Baron grading scale.⁸ Patients were graded for their initial acne scars based on the Goodman and Baron grading system⁸ and micro-needling using standard treatment protocol was done on all the patients for 3 sessions one month apart. At the end of treatment, the scars were graded again and the effectiveness of treatment was labeled as a decrease in 2 grades of scarring based on Goodman the and Baron grading system and noted in proforma.

Before treatment, 45 patients (54.2%) were having Grade III scars while 38 patients (45.8%) were having Grade IV acne scars.

At the end of treatment 40 patients (88.88%) having grade III scars showed improvement in their grades as per the defined criteria whereas 5 patients (11.11%) showed no improvement according to the set definition. There was a total of 38 patients (45.8%) presenting with grade IV acne scars of which 32 patients (84.21%) showed improvement by 2 grades whereas 6 patients (15.78%) did not meet the desired results. Hence, the response to three sessions of micro needling was significantly better in

those patients who had grade III acne scarring as compared to those who had grade IV acne scars.

After 3 sessions of micro-needling, the Grades of acne scars were found as, 44 patients (53%) had Grade I acne scars, 29 patients (35%) have grade II acne scared 10 patients (12%) had Grade III acne scars. The efficacy of micro-needling was found in 72 patients (86.7%). Stratification about age, gender, duration of disease, and base, line acne grading was carried out. Patients were categorized into two age groups. It was observed that patients in Group A (18-25years) had significantly better results than Group B (26-35years). Out of the 21 males, 19 patients (90.47%) showed efficacy for micro-needling while 2 patients (9.52%) showed no improvement. Of the 62 females treated for their post-acne scars, 53 patients (85.48%) showed efficacy for micro-needling while 9 patients (14.51%) did not improve according to set criteria; 2-grade improvement from the baseline. No adverse were noted apart from temporary redness and patients tolerated the procedure with minimal pain. No hindrance was observed in the patient's daily activity after the sessions except for mild crusting that lasted for 1 or 2 days. Patients resumed their routine duties on the same day.

After 3 sessions of micro-needling in intervals of 4 weeks, it was found that 72 (86.7%) of the patients had effective responses to the therapy. The remaining 11 (13.3%) did show some response (one-grade improvement in scoring scale) but did not achieve as per defined criteria, that is to say, improvement in 2 grades from the baseline.⁸

Comparison of Pre- and Post-Treatment Acne Scarring Grades

Pre-Treatment Grade			Post-Treatment Grade		
Grade	Number (n)	Percentage (%)	Grade	Number (n)	Percentage (%)
Grade I	Not Enrolled	Not Enrolled	Grade I	44	53.0
Grade II	Not Enrolled	Not Enrolled	Grade II	29	35.0
Grade III	45	54.2	Grade III	10	12.0
Grade IV	38	45.8			
Total	83	100.0	Total	83	100.0

Efficacy of Micro-needling

Efficacy	Number(n)	Percentage (%)
Yes	72	86.7
No	11	13.3
Total	83	100.0

Stratification for baseline acne grading

Baseline acne grading	Improvement		Total	p-value
	Yes	No		
Grade III	40	5	45	P≤0.05
Grade IV	32	6	38	
Total	72	11	83	

DISCUSSION

Less invasive techniques are used as modern modalities for collagen building, tightening of the skin, and its reuse, nation. There is no damage to the epidermis while at the same time enhancing dermal protein formation, with minimal side effects and no downtime.^{9,10}

In the current study, the efficacy of micro-needling was evaluated for post-acne scars. It is a minimally invasive modality with very little downtime. We performed micro needling three times at four weeks intervals. We found it effective in 86.7% of patients. These results are comparable with most of the local and international literature.

To attain the desired results, multiple sittings of micro-needling are needed. Approximately four weeks are recommended between two sittings. In other studies, sessions varied from two to six sittings. However, the total number of sessions needed to achieve the anticipated results is not established yet.

In research conducted by Dr. Ummer Yaseen in 2017 at Mubarak Hospital Srinagar, a total of thirty-five patients with post-acne scars were included after being graded using the Goodman and Baron's qualitative score. They combined micro-needling with Platelet-rich plasma injections at 2 weekly intervals alternatively. A total of six such sittings were carried out. Pre-treatment and post-treatment scars were

graded. The patient's self-perception of improvement was also considered.

Results showed that twelve patients had grade IV acne scars, eight (66.6%) of which subsequently improved to grade II, and 4 (33.3%) improved to grade III scars. 15 patients had grade III scars, of which eight (53.3%) upgraded to grade I, and 7 (46.6%) improved to grade II. Eight (100%) patients with grade II scars upgraded to grade I.

Overall results were highly satisfactory for the treated patients. It proved to be a good combination of treatments for scars of all grades.

In the current study, statistically significant improvement was noted by the treated patients in terms of reduction in scars, and improvement in the texture of the skin. After two sessions only moderate satisfaction was seen. However, the desired results were obtained after three sessions using micro needling as a single modality of treatment with greater patient satisfaction.^{11,12}

K Varma, S Bhargava, and U Kumar conducted a study in 2018 in Hong Kong. 36 cases were included in the study. Patients of age ranging from nineteen years to thirty-five years (mean 24.8 years) were selected. It included twenty females and sixteen males. Before the treatment, eighteen patients had Grade-III scars while fourteen patients had Grade-IV scars and four patients had Grade-II scars. Out of these, 4 patients could not remain in the follow-up.

Three sessions were carried out at four weekly intervals. The patient's scars improved to grade II significantly from eleven percent to thirty-eight percent ($p=0.006$). The patients with grade-III scars remained almost the same ($p=0.81$) as 9 cases from grade IV had upgraded to grade III. After the study, the overall number of patients with grade-IV scars declined significantly from thirty-nine percent to fourteen percent ($p=0.01$).

We evaluated the responses about age and gender in our study population but to the best of our knowledge, no existing research has such an evaluation.

The results of the present study agree with the studies conducted by K Varma, S Bhargava, and U Kumar, which evaluated the effect of micro-needling on post-acne scars.¹²⁻¹⁴

CONCLUSION

Micro-needling has proven to be a minimally invasive and relatively risk-free procedure with proven efficacy in the treatment of patients with post-acne scars. Multiple sessions are however required to promote the repair process in scars with very minimal downtime.

Micro needling was significantly effective for a P value ≤ 0.05 in the younger age group and patients with grade III acne scarring. However, the results were not prominently different as per gender distribution and duration of disease. It was found to be a safe procedure due to minimal side effects.

Further research is however required to evaluate its efficacy in other grades of acne scarring. It is also recommended to combine this therapeutic option with other modalities like PRP and chemical peeling to establish its efficacy in acne scarring in patients with Fitzpatrick 4 and 5 skin types.

AUTHOR'S CONTRIBUTION

AA: Conception of idea, data collection and manuscript writing
SK: Data collection and collection of reference
UA: Results and discussion, overall supervision of project

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Original Article

FENUGREEK TREATMENT OF POLYCYSTIC OVARIAN SYNDROME: AN IN-SILICO EVALUATION TO EXPLORE THE THERAPEUTIC EFFICACY OF QUERCETIN

Imtiaz Bashir¹, Maheen Zahid², Aymen Mumtaz³, Bisma Malik⁴, Aniq Mushtaq⁵, Hafsa Imran⁶, Farhat Ijaz⁷, Rana Khurram Aftab⁸

ABSTRACT

Background: Polycystic ovarian syndrome (PCOS) is a fairly common condition that affects both endocrine and metabolic systems. It affects women of reproductive age of all ethnicity and race. Only a small number of females are diagnosed with it. There is a good percentage of people who are still not diagnosed because of a lack of good diagnostic criteria and varying symptoms among different individuals. Fenugreek is an herb that contains many constituents including Quercetin. It helps in the regulation of steroidogenesis.

Material and Methods: Molecular docking of Quercetin with insulin receptor substrate 1, follicle-stimulating hormone receptor and androgen receptor was performed using Autodock4. The ADME (absorption, distribution, metabolism and excretion) properties were calculated by using smile notation in the Swiss ADME web-based tool. The Bioavailability Score was calculated using Mol-inspiration web-based tool.

Results: The study shows that Quercetin is having best binding capacity with the androgen receptor and also shows good binding affinity with FSH receptors and Insulin receptors. This indicates Quercetin can have a positive effect on PCOS.

Conclusion: We can conclude that Quercetin is helpful for the treatment of PCOS.

Key Words: Quercetin, Polycystic ovarian syndrome, Diabetes mellitus

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INTRODUCTION

Poly Cystic Ovarian Syndrome (PCOS), a major endocrinopathy, is a common condition that affects both the physical and emotional well-being of many women across the world. PCOS is characterized by increased androgen production and Insulin resistance along with increased insulin protection which can result in Type 2 Diabetes Mellitus.¹

PCOS is known to affect 2-20% of reproductive-aged females worldwide of all ethnicity and race. Increased level of androgens prevents the edition of progesterone from ovaries which is important for the maturation of eggs. As a result, numerous small cysts (fluid-filled sacs) form in the ovaries. PCOS is considered a syndrome because the signs and symptoms vary from woman to woman. The cause of PCOS is a combination of many factors including obesity and hormonal change but the exact cause of PCOS is still unknown.² PCOS is characterized by increased androgen production and Insulin resistance along with increased insulin protection which can result in Type 2 Diabetes Mellitus. Complications

¹⁻⁶Student 4th year MBBS, CMH Lahore Medical College

⁷Associate Professor Physiology, CMH Lahore Medical College

⁸AMS, Punjab Institute of Cardiology

of this syndrome include, infertility, insulin resistance, obesity, depression, increased risk of development of type 2 diabetes, hypertriglyceridemia, gestational diabetes and metabolic syndrome. Obesity is associated with PCOS and can worsen the complications of this disorder. PCOS etiology is heterogeneous. It is caused by a combination of reproductive and metabolic disorders.¹

Ovaries contain immature eggs stored in small fluid-filled follicles. FSH (Follicle stimulating hormone) and LH (Luteinizing hormone) are secreted by anterior pituitary gland that causes increase in size of follicle and maturation of eggs and secretion of estrogen. Once a certain level of estrogen is secreted, a Luteinizing hormone surge from the pituitary gland towards the ovaries causes ovulation. The left-out follicles and eggs dissolves and the egg travels in the fallopian tube where it awaits fertilization, If the egg fails to fertilize then the endometrium of uterus sheds causing menstruation and cycle the repeats.³ In PCOS, normal menstrual cycle is disturbed as pituitary gland releases excess amount of Luteinizing hormone. Hence follicle doesn't mature, and ovulation doesn't occur leading to anovulation. The follicle that didn't mature persists as fluid filled sacs or cysts. These cysts secrete increased amount of testosterone causing anovulation and hence infertility.²

Treatment of PCOS is still a challenge. Over the past few years, the use of natural products to treat diseases has become common, for the treatment of PCOS, fenugreek is one of them. Fenugreek (*Trigonella foenum-graceum* L.) is known to treat Diabetes mellitus. Constituent of Fenugreek that is important with respect to treatment of PCOS is Quercetin. Quercetin has antioxidant and anti-inflammatory roles.⁴ Much research has been conducted on Quercetin and its benefits. Quercetin decreases insulin resistance.⁵ Quercetin exerted protective effect against PCOS in the rat model by enhancing levels of antioxidant enzymes, also helps in the prevention of weight gain and causes significant decline in serum glucose level.^{6,7} This study was aimed to evaluate the activity

of phytochemicals of the herbal substance Fenugreek on Androgen Receptors (AR), Follicle Stimulating Hormone Receptors (FSHR) and Insulin Receptor (IR).

MATERIAL AND METHODS

This In-silico study was conducted in CMH Lahore Medical College between March 2022 to June 2022. The three-dimensional crystal structure of insulin receptor substrate 1(IRS 1), follicle stimulating hormone (FSH) receptor and androgen receptor (PDB ID 1IRS, 1XUN & 1E3G) was downloaded from the RCSB Protein Data Bank.

The chemical structure of the ligands was obtained from PubChem compound database. It was prepared by Chem-Bio Draw and MOL SDF format of this ligand was converted to PDBQT file using PyRx tool to generate atomic coordinates.

Molecular docking of Quercetin with insulin receptors substrate 1, follicle stimulating hormone receptors and androgen receptors were performed using Autodock4. The 3D structure of androgen receptor, insulin receptors substrate 1(IRS 1) and follicle stimulating hormone (FSH) receptor (PDB ID 1E3G, 1IRS & 1XUN) were acquired from RCSB (Research Collaborator for Structural Bioinformatics).

The ADME (absorption, distribution, metabolism and excretion) properties were calculated by using smile notation in Swiss ADME web-based tool.⁸

Molecular docking is used to recognize and optimize drug candidates by examining and modelling molecular interactions between ligand and target macromolecules. Molecular docking is used to generate multiple ligand conformations and orientations and the most appropriate ones are selected.⁹

RESULTS

Using computer-based methods like ADMET tools the molecular descriptors and drug likeliness properties was studied. Annexure I give the pharmacokinetic properties of the drug Quercetin.

The docking score of the compound shows good binding affinities with the given

receptors. The docking score of Quercetin with the three receptors are shown in the table 1.

Table 1. Results of Molecular Docking of Quercetin

Receptor	Binding Energy kCal/mol
Androgen receptors	-13.82 (KI = 74.69pM)
Follicle Stimulating Hormone receptors	-5.96 (kI = 42.64uM)
Insulin Receptors	-3.33 (kI = 3.62mM)

Figures 1, 2 and 3 illustrate the interactions of Quercetin with the given receptors.

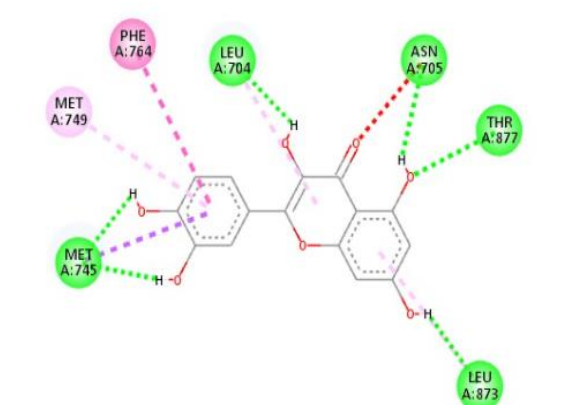


Figure-1: Interaction of Quercetin with Androgen Receptors (Note 6 hydrogen bonds in Green)

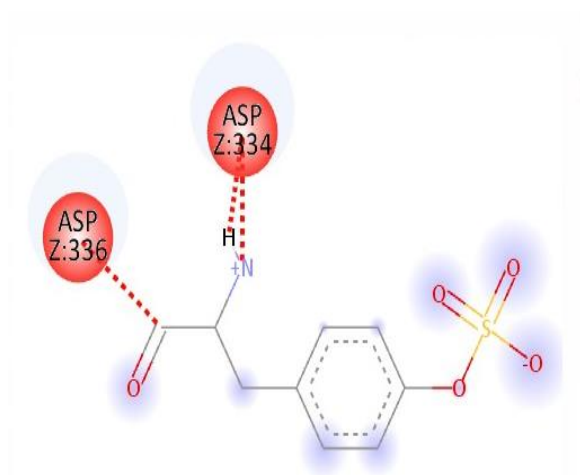


Figure-2: Interaction of Quercetin with FSH Receptor

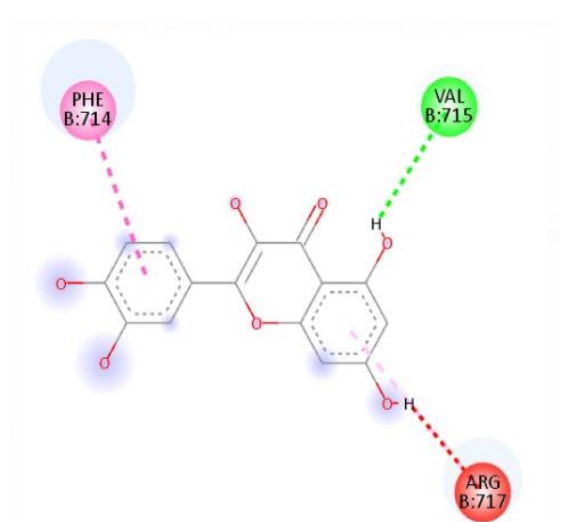


Figure-3: Interaction of Quercetin with Insulin Receptor

DISCUSSION

PCOS can cause insulin resistance in 50-70% cases, dyslipidemia in 70% cases and is associated with metabolize disorder/syndrome. As technology is progressing, many new protein targets are being discovered which results in a need for processing systems that can identify and analyze active sites and put forth drugs that can react with active sites. Docking is such a processing system that determines the binding affinity among molecules. If we are given a ligand and a protein, we can analyze their binding affinity by docking them. Swiss ADME web tools are used to determine molecular weight (MW), molecular refractivity (MR), polar surface area and count of specific atom types. Annexure I explains that Quercetin has 1 rotatable bond and 7 H-bond acceptors. Lipophilicity is described by partition coefficient between n octanol and water (log Po/w). Lipophilic character of the drug and predictive models were determined by Swiss ADME. The predictive models are; WLOGP has its basis on fragmental system of Wildman and Crippen, it is an atomistic method; XLOGP3 constitutes corrective factor and knowledge-based library, it is an atomistic method; iLOGP based on free energy of solvation in n-octanol and water determined by GB/SA (Generalized-Born

and solvent accessible surface area), it is a physics based method. Two drugs or drugs like external sets were cross reacted with iLOGP; MLOGP based on relationship with 13 molecular descriptors, it is a topological method; SILICOS-IT based on 27 fragments and 7 topological descriptors, it is a hybrid method. Lipophilicity of Quercetin is shown in Annexure I.

Formulation and handling of a drug is made easy by a soluble compound. Also, soluble compound facilitates absorption for oral administration, parenteral administration also requires high solubility to provide appropriate quantity of active ingredient in small volume. Swiss ADME constitutes a couple of topological methods to predict solubility. Annexure I depicts that quercetin is soluble in all areas. To analyze active transport through biological membrane e.g., from GIT wall to lumen requires information if the compound is a substrate or not a substrate of permeability glycoprotein (most significant member among ABC transporter or ATP binding cassette transporter as P-gp suggested). Examination if a chemical can be a substrate of P-gp or important CYP isoenzymes inhibitors is done by Swiss ADME. Annexure I makes it clear that Quercetin is not a P-gp substrate. Swiss ADME provides five rule-based filters with wide range of properties which can determine if a molecule is drug like or not. The pioneer is the Lipinski (Pfizer) filter the other four rules are Ghose (Amgen), Veber (GSK), Egan (Pharmacia) and Muegge (Bayer). Output panel explains any violation of any rule.

Quercetin shows no violation of the rules mentioned above and its bioavailability score is 0.55. Significant aspect of structural based drug designing is estimating the binding affinity among a small molecule docked on a binding site of a receptor. Drug discovery, virtual screening, molecular docking, offering multicore capability, high performance and enhanced accuracy and ease to use are the properties provided by an open-source program AutoDock Vina. If structure of ligand-protein is known, then the docking

tool's ability to remake the binding mode of protein and a ligand is analyzed by the parameters chosen for docking. Table 1 shows that Quercetin and androgen receptors have the best docking abilities. Quercetin also has binding affinity with FSH receptors and IRS1 receptors. These findings support the results of previous studies which suggest the protective role of Quercetin against PCOS.¹⁰⁻¹⁵ Our study provides a probable mechanism of functioning of quercetin in the protection of insulin resistance in PCOS.

CONCLUSION

Computational tools may be helpful in finding the cause of this syndrome. Nowadays PCOS has become a major issue, that's why we are in a dire need for effective and efficient treatment. Quercetin helps in regulation of steroidogenesis. The study shows that Quercetin is having best binding capacity with the androgen receptors and also shows good binding affinity with FSH receptors and Insulin Receptor this indicates Quercetin can have positive effect on PCOS. Thus, we can infer that Quercetin might be helpful for the treatment of PCOS. Further studies and trials are required to assess its actions.

Conflict of Interest

The authors declare no conflict of interest.

Funding

None to declare

AUTHOR'S CONTRIBUTION

IB: Conception of the idea, devising the methodology and data analysis
 MZ: Article writing, referencing and rephrasing
 AM: Article writing and referencing
 BM: Article writing and data collection
 AM: Article writing and referencing
 HI: Article writing and referencing
 FI: Devised the methodology and overall supervision
 RKA: Devised the methodology and overall supervision

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Annexure I: Pharmacokinetic Properties of Quercetin

1. Physicochemical Properties of Quercetin	
Molecular Formula	C ₁₅ H ₁₀ O ₇
Molecular weight	302.24 g/mol
Num. heavy atoms	22
Num. aromatic heavy atoms	16
Num. rotatable bonds	1
Num. H-bond acceptors	7
Num. H-bond donors	5
Molar Refractivity	78.03
Topological Polar Surface Area (TPSA)	131.36 Å ²
2. Lipophilicity of Quercetin	
Log Po/w (iLOGP)	1.63
Log Po/w (XLOGP3)	1.54
Log Po/w (WLOGP)	1.99
Log Po/w (MLOGP)	-0.56
Consensus Log Po/w	1.23
3. Water Solubility of Quercetin	
Log S (ESOL)	-3.16
Solubility	2.11e-01 mg/ml ; 6.98e-04 mol/l
Class	Soluble
4. Pharmacokinetics	
GI absorption	High
BBB permeant	No
P-glycoprotein substrate	No
CYP1A2 inhibitor	Yes
CYP2C19 inhibitor	No
CYP2C9 inhibitor	No
CYP2D6 inhibitor	Yes
CYP3A4 inhibitor	Yes
Log Kp (skin permeation)	-7.05 cm/s
5. Drug Likeness of Quercetin	
Lipinski	Yes; 0 violation
Ghose	Yes
Veber	Yes
Egan	Yes
Muegge	Yes
Bioavailability Score	0.55
6. Bioavailability Scores of Quercetin	
GPCR ligand	-0.06
Ion channel modulator	-0.19
Kinase inhibitor	0.28
Nuclear receptor ligand	0.36
Protease inhibitor	-0.25
Enzyme inhibitor	0.28

Original Article

LEVEL OF PATIENTS' EDUCATION AND KNOWLEDGE ABOUT INFORMED CONSENT OF CESAREAN SECTION IN FEMALES UNDERGOING PLANNED CESAREAN SECTION

Robina Zahoor¹, Rabia², Adila Ashraf³, Hania Zafar⁴, Shazia Abid⁵

ABSTRACT

Background: The consent-providing individual must not only have the appropriate mental ability but also have all of the required knowledge to give consent correctly. The patient must provide consent to accept or decline any treatment or examination. The study aimed to find the level of patients' education and knowledge about informed consent of cesarean section in females undergoing planned cesarean section

Material and Methods: This study was cross-sectional and carried out at Unit I, Department of Obstetrics and Gynecology, Sir Gangs Ram Hospital, Lahore for a duration of six months after approval of synopsis from January 2022 to June 2022. All the enrolled patients were asked about the informed consent of cesarean section before undergoing cesarean section and their knowledge about informed consent was noted. The Female education about informed consent was obtained as per operational definition by the researcher herself after the procedure. Data analysis was done through SPSS version 21 software.

Results: A total of 100 cases were enrolled in the current study. Level of adequate knowledge about informed consent of cesarean section was recorded in 74 (74%) of the cases whereas adequate knowledge was not recorded in 26 (26%) cases. Level of adequate education about informed consent of cesarean section was recorded in 9 (9%) of the cases whereas adequate education was not recorded in 91 (91%) cases.

Conclusion: Our study concluded that a high number of patients have an adequate level of knowledge about informed consent for cesarean section in females undergoing planned cesarean section while the level of adequate education was very low

Key Words: Education, Knowledge, Consent form

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INTRODUCTION

Cesarean section (CS) is one of the most common major operations in the field of Gynaecology and Obstetrics. Though WHO has tried to restrict the rate of cesarean section to 15% of all deliveries, it has been in vain.

The rate of cesarean sections is increasing day by day. In a current study, the prevalence of cesarean section in Pakistan was 28%.¹ Cesarean section has now become much safer than before with better anesthetic facilities and a well-defined surgical protocol.² In this era of the Consumer Protection Act and litigation in all aspects of health care, the patient is supposed to be given an informed choice and informed consent in a written format about any intervention or medication done on her.³ CS is one of the major

¹Woman Medical Officer at Govt. Haji Abdul Qayyum Teaching Hospital.

²Senior Registrar at Ali Fatima Hospital, Lahore.

³Assistant Professor at Ali Fatima Hospital, Lahore.

⁴Senior Registrar at Ali Fatima Hospital, Lahore.

⁵Senior Consultant at Indus Hospital Jubilee Town, Lahore.

surgical methods in both developed and developing countries.⁴

Study findings show a strong need for doctors to inform pregnant mothers about Caesarean section sectioning at their appointments.⁵ Additional studies suggest that when individuals are informed about their situation, they become more effectively engaged in the decision-making process.⁶⁻⁸

Due to their increased knowledge of its benefits and safety, as well as the growing significance of the right to make a choice about the manner of birth on one's own, women in industrialized nations often consent to cesarean sections.⁹ In contrast, owing to their cultural beliefs and social conventions, women in poorer nations are hesitant to consent to cesarean deliveries. They make an effort to forgo hospital delivery and hire inexperienced, untrained caregivers. These women often present to hospitals with life-threatening problems, and in such cases, the majority of procedures are carried out in an emergency setting under less-than-ideal conditions.^{10,11}

The findings of the previous study showed that the pre-training knowledge score of the patients regarding cesarean sections dramatically rose after the informed consent, although a little decrease in trait anxiety was observed.¹² In this research, 71% of the women were aware of the indications and necessity for cesarean birth, according to the findings. Out of the total participants, only 25% of these women had the appropriate education regarding the surgery and its potential risks.¹³

The rationale of this study is to find the level of patients' education and knowledge about informed consent for cesarean section in females undergoing planned cesarean section. The literature review shows that most of the females were aware of informed consent related to cesarean section but few females were educated about the informed consent of cesarean section. Moreover, there is no local data available, which tells how much there is need to educate females about informed consent related to cesarean section. This study was conducted to achieve local

evidence on the level of patient education and knowledge about informed consent of cesarean section in females undergoing planned cesarean section. This study will help in planning the strategy to educate females about informed consent and its contents so females can be aware of their condition.

OPERATIONAL DEFINITIONS

Planned Cesarean Section: It is defined as pregnant females planning to undergo delivery through an incision in the lower abdomen due to indication i.e. diabetes with complications, eclampsia (convulsions with PIH), cephalopelvic disproportion (on USG), premature rupture of membranes (PROM) (on per speculum examination) and fetal distress.

Patients' Knowledge: It was labeled as adequate if the female was previously aware of the informed consent that is signed before she undergoes a cesarean section by herself and calculated by correctly answering >5/10 questions asked in the proforma.

Patient's Education: It was labeled as adequate if the female was informed or given an explanation about the informed consent of cesarean section by a doctor and calculated by correctly answering $\geq$ 5/8 questions asked in the proforma.

MATERIAL AND METHODS

This study was cross-sectional and carried out at Unit I, Department of Obstetrics and Gynecology, Sir Gangs Ram Hospital, Lahore. The duration of the study was six months after approval of the synopsis from January 2022 to June 2022. The sample size of the current study was 100 cases based on 95% CI (confidence level), 8.5% level of significance, and by taking an expected level of female education about informed consent in females undergoing cesarean section as 25% based on the previous study.¹³ A consecutive non-probability sampling technique was used. The criterion for

inclusion in our study was all the females of age 20-40 years, parity <5 presenting at gestational age >36 weeks undergoing planned cesarean section whereas the criterion for exclusion in our study was all the females with mental retardation problems. The study was explained in detail to all the participants and then informed consent was taken from all the enrolled patients in written form. Socio-demographic information like age, name, gestational age and parity and contact was documented in a pre-designed Performa. All the enrolled patients were asked about the informed consent of cesarean section before undergoing cesarean section and her knowledge about informed consent was noted. Female's education about informed consent was obtained as per operational definition) by the researcher herself after the procedure. All this information was recorded in the Performa. Data analysis was done through SPSS version 21 software. For the quantitative variables in our study like age and gestational age, means and SDs were determined while for qualitative variables such as parity, knowledge and education about informed consent, frequencies and percentages were documented.

RESULTS

In this study, a total of 100 cases were enrolled to record the level of patients' education and knowledge about informed consent of cesarean section in females undergoing planned cesarean section. Distribution of patients based on age shows that 67 (67%) patients were in the age group 20-30 years whereas 33 (33%) patients were in the 31-40 years age group. The mean $\pm$ SD age in the current was 28.61 ± 3.89 years. Distribution of patients based on gestation shows that the gestational age in 76 (76%) patients were 37-39 weeks whereas 24 (24%) had >39 weeks gestational age. The mean $\pm$ SD gestational age in the current was 38.44 ± 1.13 weeks. Patient distribution on parity shows that 64 (64%) patients were between 1-2 parity and 36 (36%) patients were between 3-4 parity with mean $\pm$ SD of

2.27 ± 0.86 parity. Educational status shows that 12 (12%) patients were illiterate, 38 (38%) had primary level education, 25 (25%) had middle level education whereas 25 (25%) patients were matric and above. Socioeconomic status shows that 51 (51%) patients had low socioeconomic status whereas 49 (49%) patients had middle socioeconomic class and no patients were with high economic status. (Table 1)

Level of adequate knowledge about informed consent of cesarean section was recorded in 74 (74%) of the cases whereas adequate knowledge was not recorded in 26 (26%) cases. (Figure 1)

Level of adequate education about informed consent of cesarean section was recorded in 9 (9%) of the cases whereas adequate education was not recorded in 91 (91%) cases. (Figure 2)

Table 1: Socio-demographic data of the enrolled patients

Parameter	Sub-category	Frequency (%)
Age	20-30	67 (67%)
	31-40	33 (33%)
Gestational age	37-39	76 (76%)
	>39	24 (24%)
Parity	1-2	64 (64%)
	3-4	36 (36%)
Education	Illiterate	12 (12%)
	Primary	38 (38%)
	Middle	25 (25%)
	Matric and above	25 (25%)
Economic status	Low	51 (51%)
	Middle	49 (49%)
	High	0 (00%)

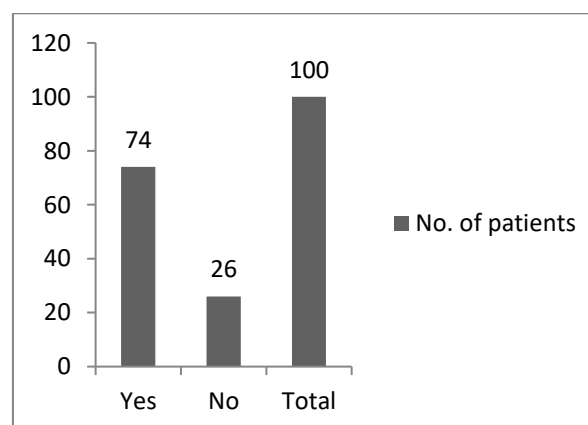


Figure 1: Level of adequate knowledge about informed consent of cesarean section in the enrolled patients

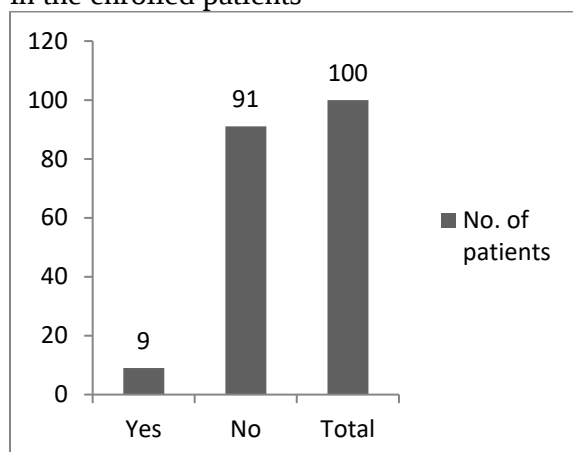


Figure 2: Level of adequate education about informed consent of cesarean section in the enrolled patients

DISCUSSION

The consent-providing individual must not only have the appropriate mental ability but also have the required knowledge about the procedure and its necessity to give informed consent.¹⁴ The patient must provide consent to accept or decline any treatment or examination.¹⁵ Additionally, it promotes the development of the patient-physician relationship. Informed consent allows the doctor to treat the patient.¹⁶ It is a necessary step that must be taken, and completion of it will fulfill the individual's fundamental requirements. Name, nature, projected advantages, hazards, alternative techniques, consequences for long-term reproductive health, and anesthesia choices are all required information in the instance of a cesarean section. Both the law and ethics demand informed consent.^{17,18}

This study was planned with the view that there is no local data available, which tells how much effort is needed to educate females about informed consent related to cesarean section. We wanted to conduct this study so that local evidence can be achieved and in the future, we can recommend a plan to educate females about informed consent and its contents and significance. In the current study, the distribution of patients based on age shows that 67% of patients

were in the age group 20-30 years whereas 33% of patients were in the 31-40 years age group. The mean $\pm$ SD age in the current was 28.61 ± 3.89 years. A level of adequate knowledge was recorded in 74% of the cases whereas adequate knowledge was not recorded in 26% of cases. Our study, another study carried out by Kirane Akhilesh G et al. reported that adequate knowledge about the need and indication of cesarean section was observed in 71% of the women enrolled in their study.¹³

In our study, the level of adequate education was recorded in 9 (9%) of the cases whereas adequate education was not recorded in 91 (91%) cases. Another study reported that only 25% of these women had the appropriate education regarding cesarean section, its potential risks, and consent.¹³

According to a similar current study, 87% of the patients were informed that C-section deliveries were necessary. They emphasized the need of providing patients with proper counseling on the risks associated with cesarean sections.¹⁹

According to a study by Latika et al. on the effectiveness of consent forms in patients of cesarean section, the majority of patients were between the ages of 21 and 30 years and about 71% of the participants were from rural regions. The cesarean section resulted in term live deliveries in 90% of instances, with 85% of these cases being emergency cesarean sections. On a five-point Likert scale, fourteen questions on different factors of the consent form were inquired of the patients. They concluded that the most of cesarean sections were done for emergency reasons. Generally, the majority of patients were observed with adequate knowledge about the surgery and its potential side effects.²⁰

A study was carried out by Yildirim G et al. on the impact of information that is given to patients before the cesarean section on their anxiety level and knowledge about informed consent. They observed that the mean (SD) knowledge scores of the patients before the information of cesarean section were 14.8 (5.5) while after the information was 29.8

(2) ($p < 0.05$). They also observed that their mean (SD) anxiety score before the information of cesarean section was 28.4 (6.6) while after the information 28.0 (5.9) ($p > 0.05$). The findings of this study showed that the pre-training knowledge score of the patients regarding cesarean sections dramatically rose after the informed consent, although a little decrease in trait anxiety was observed.¹²

An investigation on pregnant women's attitudes, knowledge, and preferences towards vaginal and cesarean deliveries was conducted in Hyderabad in 2009, and the results revealed that the women in that setting had low levels of knowledge about delivery methods and a favorable attitude toward vaginal birth. They recommended that a program is required to expand women's knowledge of different delivery options.¹⁰

The major strength of our study is that this research was the first one carried out in our country while the major limitation is the small sample size and single-centre nature of the current study. Therefore, another study with a large sample size by including multiple centers can be carried out to get more accurate results. Considering the results of our study and other studies, we are of the view that a program on a national level should be started to educate females about informed consent and its contents to make our female population aware of their condition.

CONCLUSION

Our study concluded that a high number of patients have an adequate level of knowledge about informed consent for cesarean section in females undergoing planned cesarean section while the level of adequate education was very low. Therefore, our study recommends starting a national education program for educating women about informed consent of cesarean section in females undergoing planned cesarean section.

AUTHOR'S CONTRIBUTION

RZ: Article Writing
 R: Data collection
 AA: Main idea and data collection
 HZ: Data analysis
 SA: Data analysis

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Original Article

OLD AGE HOMES PERSPECTIVE: SOCIAL SUPPORT AND LIFE SATISFACTION INSIGHTS FROM THE RETIREMENT COMMUNITY

Muhammad Safdar¹, Amna Ilyas², Mussarat Hussain³, Umair Ahmed⁴, Tahira Faiz⁵, Ajmal Khan⁶

ABSTRACT

Background: Problems relating to old age are on the rise in many countries. To get a wider view of the existing situation in Pakistan, this study explored the relationship between social support and its effects on satisfaction in life in the older population residing in old-age homes. Efforts of non-governmental organizations in Pakistan are increasing day by day in the fields of medical, social, financial, psychological, physical, public interests and all other factors to decrease maltreatment of the elderly. But in present days, the situation towards older adults has been changed by our society. The reason behind their homelessness is the attitude of family, friends and other social contacts. The current study, aimed to find a correlation between social support and life satisfaction.

Material and Methods: Two scales, Satisfaction with Life developed by Ed., Diener (1985) and Multidimensional Scale for Perceived Social Support developed by Zimet et al. (1988), were used on 90 older adults for this purpose. Men and women were selected equally within the age range of 60 and above years. A sample was selected from three urban areas of Punjab Province (Lahore, Rawalpindi, and Sargodha). Data was entered in SPSS. Independent sample t-test and Pearson correlation was applied.

Results: The results showed that elderly females and males show no differences in life satisfaction ($M = 13.65$, $SD = 3.0$) as compared to males ($M = 14.4$, $SD = 3.3$). Statistical analysis of the correlation between life satisfaction and perceived social support was found to be significantly correlated.

Conclusion: Findings from the study showed a significant correlation between life satisfaction and social support.

Key Words: Social Support, Aging, Life satisfaction

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INTRODUCTION

The aging process is a natural process that has its dynamic and is uncontrolled by humans. In developed countries, chronological age plays a vital role.

In most developed countries, the retirement age of older adults is 60 to 65 years but in developing countries, the chronological aging process is not important in terms of old age.¹ Moreover, in the field of sociology, social aging is an unpredictable and slower process and it consists of socially defined positions, which is a major cause of aging. The most recent century has seen some intense changes in the fast increment in the older population all over the world because of modernization and urbanization.² These advancements have been attributed to a variety of factors, including increased life expectancy, age and lower mortality rates as a result of lifestyle advancements. Maturing is

¹Ph.D Scholar, Department of Social Work, University of the Punjab, Lahore

²M.Phil Social Work, Department of Social Work, University of Sargodha, Lahore Campus

^{3,4}Lecturer, Department of Sociology & Criminology, University of Sargodha

⁵M.Phil Sociology, Government College University Faisalabad.

⁶Lecturer Sociology, Government Boys Degree College Zhob, Balochistan.

turning out to be a significant issue for non-industrial nations similar to Pakistan, which has at present a 9 million population above the 60-year-old age mark and it has been proposed that it will increase to 42 million in 2050.^{3,4} Qualities owing to the regard and respect of the elderly are altering, the situation with old guardians has already been influenced, and the conventional family setup is likewise becoming more fragile. Because of the breakdown of the joint family framework to the family unit, a growing number of issues for senior citizens from family novation and clinical exploration.^{5,6}

In the joint family system, the cherishing environment of a home and well-disposed connections between the individuals provide security and acknowledgment to the more seasoned individuals from the family, while in the family unit structure, old guardians have next to zero power and their consideration and backing are ignored.⁷ When the endeavors of the aged to spend time and engage in activities with their youngsters fall flat, it brings about the forlornness and lack of social help of older individuals. These unfortunate circumstances of the feeling of being useless, having no jobs or house chores, and not having good company, make them feel vulnerable and distanced from their family.⁸ In any event, old people are usually not consulted by their family members for fundamental necessities, and as an outcome, older people wind up confronting difficulties.⁹ It has likewise been noticed that this change has brought about no regard, no consideration, detachment, chronic weakness and actual maltreatment for old people physical health status.^{10,11} The deficiency of a stable source of income may make them more prone to health problems. Likewise, inactivity also affects older adults' health, whether it be physical or psychological, which later on leads to various effects such as heart problems, hypertension, diabetes, arthritis, asthma, etc. The majority of older adults feel lonely because of the lack of attention from their kids, family and society. The mental stress eventually increases their chances of falling prey to health-related issues and complications.¹²

Aging is a worldwide occurrence, but it does not have the same familiarity among all older adults. Some older adults attain a feeling of gratification and fulfillment in their later years, whereas others become unpleasant and lament the failure of their capabilities and social importance. Satisfaction with life in the older population is a vital concept because it has a major impact and it may provide us with a complete sense of the highest populations living among us, whether they are maturing successfully or not. A few modifiable factors of fruitful aging are health conditions, marital circumstances, socioeconomic status, and age category. Many studies have explored the value of these various aspects, including all of the aforementioned variables and the strength of their impact on life and satisfaction among older adults.^{13,14} Social support has resources provided by human beings that help one to feel worth living, protected, and cared for. People of old age often witness depressing situations like losing spouses or close relatives, which take them depression and gives them a sense of loneliness. Furthermore, health issues are more common in old age than in younger people.¹⁵

The huge popularity of research on this subject has been accompanied by older people residing in a circle. This research is original as it inspects the differing parts of family support, which comprises companions and mates outside of the boundaries of the home and companionship in treatment homes, on the quality of life of senior citizens in long-term care.¹⁶ The relatives are worried about the well-being of older people, but financial accountabilities are also a matter of concern for them. In 82.8% of the cases, children seemed to be very helpful and accommodating, whereas, in 17.2% of the cases, the family members were completely oblivious to their needs. About 46% of older people were primarily cared for by others, while 34% were cared for by their children. Almost 44.3% of older people could still handle their economic business. In 66% of the cases, no kind of monetary stabilization was provided by the governing bodies. About 28.9% of cases were those where older people demanded

support from other sources.¹⁷ Perceiving social support reduces the occurrence of unwanted physiological problems associated with illnesses, increases self-care, has a positive impact on patients' physical, psychological and social conditions, and, finally, improves functionality to achieve full recovery. According to some studies, increased social support results in lower hospitalization rates, better treatment adherence, and a reduced risk of death from chronic illnesses.¹⁸ The requirement for social support is urgent, mainly in the aged in lower states of physical health, as they lose some of their critical abilities to accomplish daily life due to physical or mental weakness, and this can prime them for several difficulties.¹⁹ Instrumental support is provided by the family at times when needed, but unfortunately, this assistance given by these relationships is very volatile and can end abruptly any day.

Given the nonexistence of culturally-designated responsibilities to deliver such assistance to older people, pledge and support opportunities tend to be modified among associations, and our focus is to continue cooperation. Relationships with inmates are slightly more vulnerable to dissolution if the connections are more unstable than blood relationships such as those between a child and his parent. The availability of mates, relatives, and neighbors for strong adherence is dependent on the availability of communication exchange with senior people.²⁰ Older people sharing living space with a spouse, partner, or members of their family are probed to practice optimistic strategies to endorse positivity in the later stages of their lives. Keeping a good communication system with individuals in society is substantial in keeping a better quality of life. However, the standard and volume of collaboration matter more as compared to the frequency of meetings. Senior citizens with a large circle of friends and quality of friends report the best quality of life. For people belonging to different ethnic backgrounds whose relations are interrupted by immigration and whose problems are further augmented by a language barrier in the

new place, interaction with members of their family is vital.²¹

The rationale behind researching this topic was to identify variables that contribute to the status of older people who are residents of old age homes, their health status, and the effect of social support on life satisfaction. This study will help to realize another characteristic of health effects and support problems on the life satisfaction improvements related to aging in our country. The evaluation and social support of senior citizens in old age homes in Pakistan can help endorse and design new tasks as well as improve the lives of older adults. The primary aim is to draw the attention of the policymakers to make legislation about the welfare of senior citizens who are accommodated in old age homes, which is very significant in this modern age. The current study, aimed to find a correlation between social support and life satisfaction.

MATERIAL AND METHODS

The researcher adopted the quantitative method for the research, and the data was collected through interviews. For this purpose, two scales were taken. One was Satisfaction with Life by Ed. Diener (1985), and the other was the Multidimensional Scale for Perceived Social Assistance developed by Zimet et al. (1988). The quantitative data were analyzed using SPSS. Pearson correlation and t.test were applied. The comprised sample was obtained from the specific universe. The researchers chose three divisions in Punjab for the study: Lahore, Sargodha and Rawalpindi, using simple random sampling. A convenience sample of 90 respondents was approached who were the residents of a care facility for the elderly. The visited facilities were Dar ul Kafala, Affiat, Happy Home, Senior Citizens from Lahore and Dar ul Affiat, Bint e Fatima, Dar ul Sakon in Rawalpindi and Old Age Home Sargodha. The total population was 120. Respondents were 52 females and 38 males using convenience sampling. The age range of participants was 60–70 years old.

RESULTS

Table-1: Correlation between perceived social support and life satisfaction

Variables	M	SD	r
Social Support	18.74	2.88	.506*
Life satisfaction	13.98	3.21	.071**

**Correlation is significant at the 0.01 level (2-tailed)

Pearson correlation was applied to see the relationship between deemed social support and the life satisfaction of the elderly. A positive correlation was seen between these two variables, $r = .506^{**}$, $n = 90$, $p = .000$. Generally, there was a strong positive correlation between percentages obtained by elderly people. Increases in social support were correlated with increases in health status.

Table 2-t-test: Social support of elderly people residing in old age homes ($N=90$)

	Males		Females				
Variable	M	SD	M	SD	T (88)	p	df
Percentage	18.00	2.59	18.65	3.28	.242	.810	0.20

An Independent sample t-test was applied to assess the group differences in living conditions among males and females of elderly people. Thus, the results showed that elderly people females and males show no changes or differences in social support ($M = 18.00$, $SD = 2.59$) as compared to males ($M = 18.65$, $SD = 3.28$). The differences were insignificant, $t(88) = 242.48$, $p > 0.05$. Equality of genders, or sexual equality, is the ideology of equal and unbiased ease in the utilization of the resources and opportunities indifferent to the gender.

Table 3-t-test: Life Satisfaction of senior citizens residing in old age homes ($N=90$)

	Males		Females				
Variable	M	SD	M	SD	t (88)	p	df
Percentage	13.65	3.06	14.4	3.309	-1.159	.314	0.25

An Independent sample t-test was used to assess the group differences in life Satisfaction among males and females of elderly people. Thus, the results showed that elderly people females and males show no changes or differences in life satisfaction ($M = 13.65$, $SD = 3.0$) as compared to males ($M = 14.4$, $SD = 3.3$). The differences were not significant, $t(88) = .314$, $p > 0.05$. The correlation between life satisfaction and social support of elderly people living in old age homes. Statistical analysis of the correlation between life satisfaction and perceived social support was found to be significantly correlated.

DISCUSSION

Social support is a strong determinant of content living with a longer life span. The presence of social support in older age groups, despite a person's socio-economic position, health risks, and the use of health-related facilities, has a major effect on the health status of this age group.²² Good social support balances and modifies the recovery status of these individuals. Developing countries like Pakistan are currently facing a major issue, which is population aging. Family configurations and living circumstances of elderly people are observed to be shifting in the wake of population aging in Pakistan. Even though the elderly is considered to be a pillar in certain family settings, altered family dynamics may change the outline of the provision of support in coming times.^{23,24} In advanced age, the presence of a partner or spouse provides tremendous emotional and physical support during any ailments. In particular, the widows within various societies of the Indo-Pak subcontinent are facing a more traumatic

experience as the cultural norms are against remarrying at an old age, and this has a huge impact on their mental health and physical productivity.

Even though the male members of the family are thought to play an important role in the financial support of the family, most women, particularly daughters-in-law, are imposed with the role of being the sole caregiver in the event of any elderly member's illness. It might be one of the major reasons why, in countries like Pakistan, the birth of a son is celebrated more than the birth of a daughter. Elderlies suffering from comorbidities (for example, arthritis, diabetes, stroke, quadriplegia, and visual illnesses) generally need extra support. Yet, the hierarchy of the class system also affects the amount of support being provided by the family.^{25,26} Similarly, it was discovered that elderly people from lower socioeconomic classes required more assistance with health and economic issues than those from higher socioeconomic classes. The older individuals of the upper social class did not need much support as they had enough from friends' visits and could share their problems with them.^{27,28} It is fascinating that a huge proportion of elderly individuals displayed highly satisfactory approval with the help they got from their beloved family members, especially the close ones, in the previous year. The reason for this is that older people may feel uncomfortable sharing home-related issues or, because of financial insufficiency and lack of governmental support strategies, insufficient social assistance by their family relations as they are scared of losing even the little social support they are receiving. Furthermore, descriptive statistics and univariate analysis results reinforced the statement that social security in advanced age has a substantial impact on the day-to-day actions and occupational activities of older people. Research has proposed that those who had increased social help achieved lower mean impairment scores both in ADL and IADL scoring systems when compared to those who received

decreased social abundance from their family members during the previous year.²⁹

Perceiving social support reduces the occurrence of unwanted physiological problems associated with illnesses, increases self-care, has a positive impact on patient's physical, psychological and social conditions and finally, improves functionality to achieve full recovery.³⁰ Previous research has linked increased social support to lower rates of hospitalization, better treatment adherence, and a lower risk of death from chronic illnesses. Jordan and colleagues.^{31,32} Findings from previous studies reveal that some people attain a level of gratification and fulfillment in their advanced age, while others become unpleasant and lament the failure of their occupational capabilities and social importance. Life satisfaction in the elderly is an important concept because it has significant allegations and can provide us with a complete picture of our society's higher populations maturing successfully or failing.³³

CONCLUSION

Findings of the study showed that correlation between life satisfaction and perceived social support was significant. However, gender difference has no impact on life satisfaction.

AUTHOR'S CONTRIBUTION

MS: Major conceptual framework, objectives and introduction
 AI: Formulation of research tool and literature review
 MH: Analysis along with discussion
 UA: Methodology
 TF: Discussion and conclusion
 AK: Data collection

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Original Article

PREVALENCE OF SOCIAL MEDIA WEBSITES USED BY MEDICAL STUDENTS

Sumbal Khalid¹, Muhammad Sohail Aslam², Zunaira Muzzamil³, Fatima Ahmar⁴, Ayesha Javaid⁵, Sara Shafique⁶, Aleem Ullah Qureshi⁷

ABSTRACT

Background: Social media use is becoming an addiction among medical students. This overuse of social media is leading to academic and mental instability in medical students. This study aimed to find out the prevalence of different social media website usage in medical students

Material and Methods: This cross-sectional study was conducted on MBBS students in the third, fourth, and fifth years. 230 Questionnaires, containing 10 questions each, were distributed among the students at Farooq Hospital, Westwood, Lahore. 195 students filled out the questionnaires to participating in the study. SPSS version 20 has been used for data analysis.

Results: Among 195 students, 99.5 % used Snapchat, 96.9 % used WhatsApp, 96.4 % used Facebook, 95.3 % used Instagram, and 76.9 % used Tiktok.

Conclusion: The majority of medical students use different social media websites. Snapchat is appeared to be the most popular website among them. Most students spend less than 1 hour on social media per day.

Key Words: Social Media, Medical Students, Questionnaires

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INTRODUCTION

Social media websites are modern technologies that provide virtual means of communication.¹ That provides a platform for the exchange of news, entertainment, information and ideas. Hence, it virtually connects people all across the globe. Famous social media websites, especially among youngsters, include Facebook, WhatsApp, Instagram, Snapchat and Tiktok.¹ More than three billion people all over the world use social media websites.² About 71 % of the people in the world who use the internet for social media are youngsters.³

Social media use has tremendously increased in the past decade due to the easy availability and affordability of gadgets and the internet.⁴ It has been seen that this usage has specifically increased among youngsters. In Pakistan, there are 25 million internet users according to the Internet Service Providers Association of Pakistan (ISPAK).⁵ This alarmingly increased use of social media has reached the point of addiction. In some studies, this social media addiction has been related to drug abuse.⁶

Excessive use of social media has badly affected the academics of students.⁷ It has also adversely affected the mental well-being of the students.^{8,9} Worldwide, social media overuse has been noticed among medical students.¹⁰ Medical students find it as a medium of escape from their stressful academic life. But, the usage of social media to the point of addiction is leading to the compromise of the physical and

¹Assistant Professor Physiology, Rashid Latif Medical Complex.

²Associate Professor Physiology, Akhtar Saeed Medical & Dental College, Lahore.

³⁻⁷Students, Akhtar Saeed Medical & Dental College, Lahore.

psychological health of medical students. Social media addiction refers to the uncontrolled desire to use social media.¹¹

Among medical students, Facebook, Instagram and WhatsApp are very popular websites.¹²

In the current study, the prevalence of different social media website usage has been studied among medical students. The time spent, every day, on these websites has also been studied.

MATERIAL AND METHODS

The study was conducted at Farooq Hospital Westwood, Lahore. The duration of the study was from 26th May to 25th July. Third, fourth, and fifth-year MBBS students were included in the study. Both males and females with the age range of 17-25 years participated. Students of BDS, nursing, physiotherapy, etc were excluded from the study. 230 Questionnaires, containing 10 questions each, were distributed, under the supervision of facilitators, among third, fourth, and fifth-year MBBS students. Out of 230 students, 195 students filled the questionnaires. The data collected were analyzed by SPSS version 20.

RESULTS

Questionnaires were distributed to 230 students but only 195 students completed the questionnaires. So, the data of those 195 students were analyzed. The prevalence of usage of Facebook, Instagram, Snapchat, Tiktok, and WhatsApp was noted. The total time spent on these websites per day was also calculated.

It was found that 96.4 % of students used Facebook. About 95.3 % of students used Instagram. Almost 99.5 % of students spend time on Snapchat. Around 76.9 % of students used Tiktok. 96.9 % of students used WhatsApp. This data showed that Snapchat was the most popular social media website among medical students. The second most popular social media website, among medical students, was WhatsApp. Tiktok seemed to

be the least favorite website among medical students. (Figure-1)

Thirty-eight-point-three percent (38.3%) of students spent less than 1 hour on Facebook. 23.4% of students spent more than 4 hours on Facebook. About 17%, 12.2 %, 4.7 %, and 4.2% of students spend 1 hour, 2 hours, 3 hours, and 4 hours on Facebook respectively. It showed that most of the students spent less than 1 hour on Facebook.

As regards Instagram, 24.1% of students spent less than 1 hour on Instagram. 26.3% of students spent more than 4 hours on Instagram. About 11.8%, 15 %, 12.9 %, and 9.1% of students spent 1 hour, 2 hours, 3 hours, and 4 hours on Instagram respectively. This shows that most of the students spent more than 4 hours on Instagram.

About 56.7 % of students spend less than 1 hour on Snapchat. About 7.21 % of students remained involved for more than 4 hours on Snapchat. About 14.9%, 9.27 %, 5.15 %, and 1.03 % of students remained involved for 1 hour, 2 hours, 3 hours, and 4 hours on Snapchat respectively. This showed that most of the students spent less than 1 hour on Snapchat.

Around 80 % of students spent less than 1 hour on Tiktok. 6.66 % of students spent more than 4 hours on Tiktok. About 5.33 %, 4.66 %, 2 %, and 1.33 % of students spent 1 hour, 2 hours, 3 hours, and 4 hours on Tiktok respectively. This showed that most students spent less than 4 hours on Tiktok.

23.2 % of students spent less than 1 hour on WhatsApp. 29.6 % of students spent more than 4 hours on WhatsApp. About 17.4 %, 12.6 %, 12.1 %, and 10.05 % of students spent 1 hour, 2 hours, 3 hours, and 4 hours on WhatsApp respectively. This shows that most students spent less than 4 hours on WhatsApp.

When average time spent on each website, it was found that the majority (45%) of the students spent less than 1 hour on social media websites. And about 19 % of students spent more than 4 hours on these social media websites. (Figure 2)

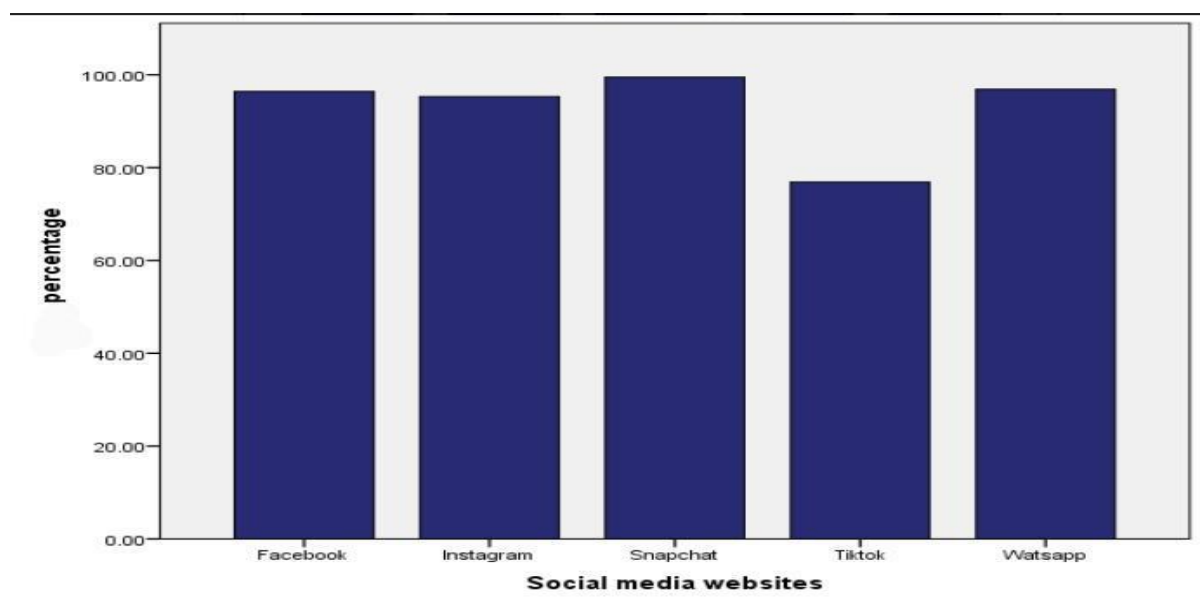


Figure-1. Different social media website usage among medical students.

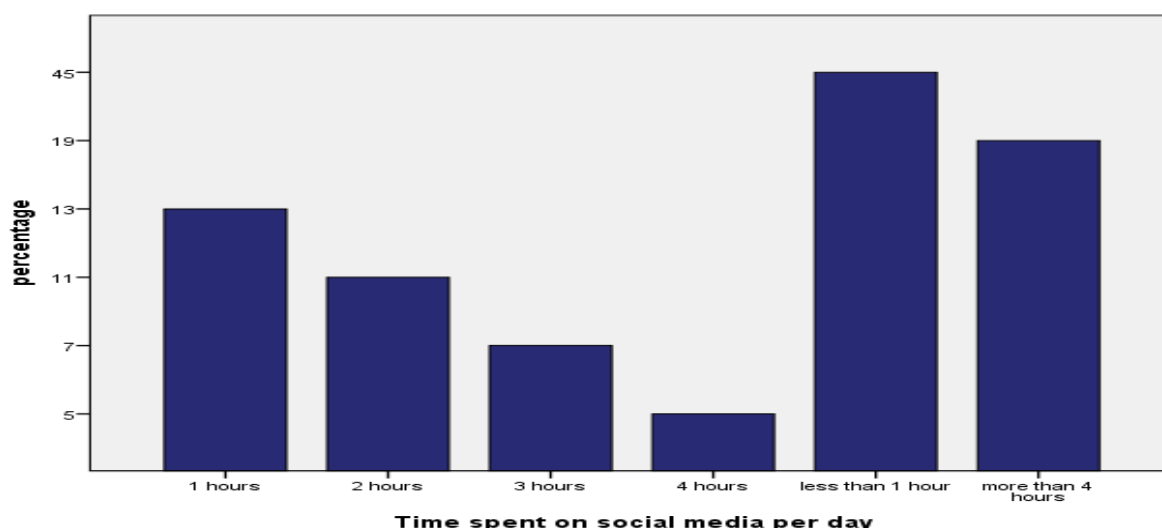


Figure-2. The time spent by students on social media websites per day

DISCUSSION

The results of the present showed that Snapchat was the most popular social media website among medical students. The second most popular website was Facebook. And WhatsApp was the third most famous website among them. Most of the students spent less than 1 hour on social media.

Snapchat appeared to be the most popular website in Kuwait too. In 2019,¹² a study was conducted on 692 college students. The data

collected revealed that Snapchat was the most popular website among students. The reason for its popularity was that Snapchat provided them with a platform for entertainment, self-expression and self-presentation.

The results of the current study are consistent with the study conducted in Pakistan in 2016 at Liaquat University of Medical and Health Sciences Jamshoro, Pakistan too.¹³ In that study, Facebook and WhatsApp were found to be two popular websites among medical

students. In the current study, similar findings were observed that Facebook and WhatsApp were popular social media websites among medical students.

A similar study was done on medical students, in Saudi Arabia. It revealed that a higher number of medical students used Facebook. The major reason for Facebook usage was entertainment.¹⁴

A study conducted in India on medical students revealed a greater number of WhatsApp users. The students told various reasons for excessive WhatsApp usage. They used WhatsApp mostly because of the easy way of communication and feasible means of chatting with friends.¹⁵

The interesting fact that was revealed in the current study was that most of the students spend less than 1 hour on social media websites per day.

CONCLUSION

Most students visit social media websites daily. Snapchat is the most popular website among them. Most students spend less than 1 hour on social media per day.

AUTHOR'S CONTRIBUTION

SK: Planning and Manuscript writing

MSA: Manuscript review

ZM: Data collection

FA: Data collection

AJ: Data collection

SS: Data collection

AUQ: Data collection

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Review Article

PHYSIOLOGICAL EFFECTS OF MUSIC IN HUMAN BEINGS

Muhammad Jabran Javaid Sidhu, Muhammad Sohail Aslam

ABSTRACT

Music and ancient art are being used as a mode of entertainment. There is evidence of its effectiveness as a therapy for different diseases. Listening to rock music (440 Hz) results in increased cortisol levels appetite, blood glucose, lipids and body weight. Whereas listening to classical music (432 Hz) leads to a significant lowering of cortisol level due to its soothing effect. It also decreases blood glucose, lipids, appetite, and body weight. Classical music exposure helps to control anxiety.

Conclusion: Listening to classical music helps to relieve anxiety and reduces blood glucose, lipids, and body weight.

Key Words: Music, Human body, Anxiety

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Effect of music on the human body

Music is an ancient art. It is being used as a treatment for many diseases.¹ Research is being carried out in different parts of the world to see the effect of music on the human body and mind.^{2,3} Music is used as a mode of entertainment and a tool for relaxation.⁴

Music history:

There are two types of music

Classical music: Originated in the early Vedic period (C1500 – 500 BCE) and the instruments include tempura, bansuri, sarangi, and tabla.⁵

Rock: Music originated in the 1950s.⁶ It uses electric guitar, amplifier, digital synthesizers, keyboard, drum, electric organ, and bass guitar as instruments.⁷ Rock music has two components, rhythm, and composition.⁸ It produces more dissonant sounds.⁹

Classical music has no separate identifiable rhythm. Its composition and rhythm are synchronized. It produces more consonant sounds.⁹

Areas of the brain affected by the music

When music is produced by an instrument, the sound waves produced to strike the tympanic membrane to produce its vibration. Through the bones of the middle ear, these vibrations are transferred to the inner ear to produce vibration of the basilar membrane. The specific frequency of music causes a specific part of the basilar membrane to vibrate. The basilar membrane converts these mechanical signals into electrical signals and these action potentials are transmitted in the auditory nerve. The action potentials reach the auditory cortex in the temporal lobe.

The Pitch and timbre of the sound are processed in the right temporal lobe.¹⁰

The amygdala after receiving classical music sound signals sends inhibiting signals to the hypothalamus which reduces the production of ACTH and hence cortisol secretion. Upon stimulation by rock music, the amygdala sends excitatory signals to the hypothalamus leading to increased production of ACTH and hence increases cortisol level.¹¹

Correlation between cortisol and oxidative stress

Prolonged stress can produce a bad effect on health^{12,13} and causes a large financial burden

¹Assistant Professor Physiology,

²Associate Professor Physiology, Akhtar Saeed Medical & Dental College, Lahore.

on the patient.¹⁴ Music has a beneficial effect on stress-related physiology.¹⁵ Stress through the hypothalamic-pituitary axis (HPA) affects the secretion of cortisol, the stress hormone.^{16,17}

Patients undergoing medical procedures have raised stress hormone levels. Music therapy showed positive effects on these patients before and during the procedure,¹⁸⁻²⁰ and also after the procedure.^{21,22}

Stress leads to anxiety that itself is the cause of stress and thus it makes a vicious cycle. Music affects parts of the brain related to emotional processing.²³ Anxiety levels are decreased in individuals exposed to soothing classical music.^{24,25} McCraty et al. showed that exposure to rock music resulted in increased cortisol levels.¹⁶

A study conducted by Joseph and Alice negated this effect.³ Oxidative stress means an imbalance between oxidants and antioxidants in the body. Oxidants act as free radicals. Antioxidants react with these free radicals to stabilize these.¹⁸ Oxidants react with polyunsaturated lipids to form products like malondialdehyde which is used as a marker to measure oxidative stress in the body.¹⁷ Reactive oxygen species are increased in a state of psychological stress.²⁶ Undo et al studied mothers having seriously ill kids. Their cortisol, oxidation stress markers, and telomere length had a positive correlation between all these.¹⁹ A study showed that music therapy improved endothelial function in coronary artery disease patients by increasing sodium levels and decreasing reactive oxygen species.²⁷

Effect of music on glucose.

In stress or fight and flight response, the body needs rapid availability of energy which is provided by gluconeogenesis.²⁸ A study by Mothahedian et al showed that classical music can be used to lower the increased stress hormone level (cortisol) and also lowered glucose levels.²⁹ Western classical music has been used to treat hyperglycemia in diabetic patients and better-controlled levels of HbA_{1c}.³⁰⁻³²

Saleem and Saleem reported that listening to relaxing music and Quranic verses reduced the level of cortisol.³³ Studies in India have revealed that listening to Indian music reduced stress hormones during a surgical procedure.^{34,35} Music therapy reduces cortisol and stress biomarkers in children undergoing minor surgical procedures.^{36,37}

Effect of music on body weight

Exposure to music changes appetite to change weight.³⁸ In hunger, ghrelin is secreted by the stomach. It acts on the hunger center in the hypothalamus to increase hunger. Increase in ghrelin, appetite, and weight was more with rock as compared to classical music.³⁵

Effect of music on lipids

Madhuri et al showed that exposure to relaxing music resulted in decreased levels of lipids in the body.³⁹ The music lowers lipid levels by increasing metabolic rate.⁴⁰

As music affects cortisol levels which then alters blood lipid levels.⁴¹ Increased cortisol secretion results in increased lipid levels including raised triglycerides and total cholesterol levels whereas HDL levels are changed variably.⁴² Cortisol raises lipoprotein lipase resulting in increased free fatty acid levels.⁴³ In another study, a positive correlation between cortisol, glucose, and lipid profile was reported.⁴⁴ Music therapy had a beneficial effect on psychological constructs and atherogenic lipoprotein in patients with severe hypercholesteremia.⁴⁵

AUTHOR'S CONTRIBUTION

MJJS: Literature survey and script writing

MSA: Edit and proofreading

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Case Report

RESPIRATORY MANIFESTATIONS OF MIXED CONNECTIVE TISSUE DISEASE IMITATING COVID-19

Haseeb Khan¹, Mariyam Iftikhar Piracha², Sarah Zaheer³, Kamil Shujaat⁴

ABSTRACT

Mixed Connective Tissue Disease (MCTD) is an autoimmune disorder showing features of a combination of primary lupus, scleroderma, and polymyositis. Sjogren syndrome is observed in some people with this uncommon disease. The patient does not show symptoms of the separate diseases in early phase, instead, they tend to show up gradually for several years, which can complicate the diagnostic procedure. The characteristic feature of MCTD is the antisemitic antibodies and antibodies against U1-ribonucleoprotein (RNP) complex. Clinically numbness of toes and fingers, myopathy, Raynaud's syndrome, swollen hands, rash, arthritis, polymyositis and interstitial lung disease are observed. The patient presented with fever, shortness of breath and dry cough and was treated along the lines of coronavirus disease. His pulmonary features resembled those of post COVID fibrosis, hence the disease was overlooked due to this pandemic.

Key Words: COVID-19, Mixed Connective Tissue Disease, Fever

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INTRODUCTION

Mixed connective tissue disease (MCTD) was well-defined in 1972 for the first time as an Autoimmune Disease Syndrome. MCTD is called overlap disease because it shows shared features of Polymyositis, Systemic Sclerosis, Systemic Lupus Erythematosus (SLE), and its related disease with the presence of antibodies against RNA sensitive extractable nuclear antigen.¹ In MCTD autoantibodies appeared against ENA, now known as RNP.² MCTD is diagnosed by the manifestation of anti-smith and anti-ribonucleotide antibodies and it is the first rheumatic disease confirmed by a serologic test.

Clinically it shows fatigue, muscle pain, joint pain, low-grade fever, a high frequency of Raynaud's syndrome, systemic sclerosis, systemic lupus erythematosus and dermatomyositis/polymyositis.³ For the past 30 years, there has been an ongoing discussion to consider MCTD a 'distinct clinical entity'.⁴

MCTD is known to occur around the world. This disease shows high female occurrence, with male to female ratio of 1:16. This disease affects every age group with a range of 4 - 80 years but 35 is the mean age of occurrence.⁵ T-cell & B cell response is also seen in patients with decreased immunity. Distinguishing lesions observed in the organs are severe obliterative vascular lesions with minimal inflammatory infiltrates. Early phases of the MCTD comprise the majority of patients complaining of Raynaud's phenomenon, myalgias, arthralgias and easy fatigability. Fevers of unidentified reasons are the main systemic feature of MCTD.⁶ Malar rash and erythematous rash are the most common skin changes seen in 75%-

¹Demonstrator, Pharmacology, Akhtar Saeed Medical & Dental College, Lahore.

²Assistant Professor, Akhtar Saeed Medical & Dental College, Lahore.

³Demonstrator, Pharmacology, Akhtar Saeed Medical & Dental College, Lahore.

⁴Assistant Professor, Radiology, Al-Nafees Medical College, Islamabad.

100% of patients. Arthritis is observed in an average of 60% of patients. 30%-50% of patients show signs of myalgias and myositis. The GIT symptoms vary from diarrhea, heartburn, dysphagia and malabsorption. In upper GIT, motility dysfunction is a crucial problem⁷ commonly, lungs and pleura can be involved. Pleurisy, pleural effusion, pulmonary arterial hypertension and diffuse parenchymal lung disease are characteristic features.⁸ In MTCD heart, it shows abnormal ECG findings which involve all layers of the heart.⁹ Neurological symptoms are minimal, which present as trigeminal neuralgia, aseptic meningitis, demyelination, transverse myelitis and peripheral neuropathy. Renal disease is absent, which is a hallmark of MCTD. The characteristic high values of anti-RNP antibodies can guard the advancement of diffuse proliferative glomerulonephritis. Some patients can present with diffuse glomerulonephritis or renal crisis of scleroderma.¹⁰

CASE REPORT

A 39-year-old male came to the emergency with a high-grade fever of 101°F, shortness of breath, and dry cough. His oxygen saturation was 70 percent, BP was 50/30 mmHg, heart rate 120/min, and respiratory rate 48 bpm. He was a suspected case of pulmonary embolism so Pulmonary Angiogram CT was done to rule out it. After admission to ICU, he was started on dual cardiac support with norepinephrine and dobutamine with normal saline. The oxygen saturation was improved to 90 percent with oxygen support and vitals were improved with blood pressure 90/60 mmHg, heart rate 100 bpm and respiratory rate 36 bpm. The patient was stable and depending on his laboratory results. He was diagnosed with a case of post-covid fibrosis, especially based on similar events of symptoms he had in November 2020 and July 2021. Labs showed Hb 7.6 g/dl, CRP 150 mg/L, TLC 26 cells/mm³. His PCR for COVID was negative. On a previous visit, he was suspected as a case of having post-COVID fibrosis and bronchopneumonia. He also had co-morbid skin involvement with

generalized severe acne all over the body and was diagnosed with seborrheic dermatitis. ACE, C3 and C4 levels were not significant. He was started on a broad-spectrum antibiotic and I/V steroids. But due to poor response, the patient was referred to a rheumatologist for detailed history. Screening for ANA levels was done which were positive. Antibodies were significantly raised against anti-smith and ribonucleic acid. A recent CT scan was compared with the previous one and showed interval progression in subpleural, mediastinal, hilar, axillary and upper abdominal lymphadenopathy and dilated air-filled esophagus leading to suspicion of mixed connective tissue disorder/overlap syndrome. The patient was stabilized and shifted to the room. He was discharged on oral medications Deltacortil and hydroxychloroquine. He was advised to follow up after 2 weeks.

DISCUSSION

Diagnosis of mixed connective tissue disease is based on clinical features and lab values along with the CT scan findings.

Serological criteria: Positive Anti RNP antibody. Anemia, leukopenia, raised ESR, positive Coomb's test, hypergammaglobulinemia (100%) and positive rheumatoid factor in patients (50-70%) are the laboratory findings.¹¹ Raised titers of antinuclear antibodies are observed in all patients with a non-uniformed speckled pattern. Hemagglutination test which detects Anti U1RNP antibodies are the distinguishing feature of MCTD. In some patients' antibodies appeared against hnRNP-A2, fibrillin-1 and nucleosomes. No antibodies were detected against RNA polymerases.¹² Management of MTCD patients is based on the specific remedies for the alike problems observed in SLE, scleroderma or polymyositis. In contrast scleroderma-like features show decreased response to therapy. Calcium channel blockers are used for PAH, NSAIDs are used to treat pain and immunosuppressive agents (steroid and methotrexate) are specifically used in patients of severe arthritis, serositis

which involves pleura, pericardium and pulmonary hypertension. There is a good prognosis seen in patients with MCTD because of a lower incidence of kidney disease and neurologic problems. The marked morbidity rate is observed in patients of MCTD because of numerous factors i.e. recurrent musculoskeletal pain, fibromyalgia and acid reflux disease. According to different studies, in MCTD, the mortality rate in the age group of 10 to 12 years ranges from 16% to 28%. Patients show poor prognosis having principal signs of scleroderma and polymyositis. Progressive pulmonary arterial hypertension and cardiac complications associated with it are the major cause of death.¹³

CONCLUSION

The present case report gives the importance of mixed connective tissue disorder to be in the differential diagnosis of any patient presenting with an overlap-features of SLE and scleroderma. Due to the pandemic, these symptoms and CT scan findings mimic those of COVID therefore, a proper history and examination are the key to the proper diagnosis and prompt treatment.

AUTHOR'S CONTRIBUTION

HK: Manuscript writing
MIP: Review manuscript
SZ: Data collection
KS: Review

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