



THE COMPENDIUM OF JUBILEE RESEARCH DAY

# ACCENTUATE

## 2023

Editors:

Ms. Mridula Vellore

Dr. Anjali Annie George

Dr. P. R. Varghese

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# Accentuate 2023

The Compendium of Jubilee Research Day



**JUBILEE** CENTRE FOR  
MEDICAL RESEARCH



Jubilee Mission Medical College & Research Institute  
Thrissur, Kerala, INDIA 680 005  
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Editors

Ms. Mridula Vellore

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## **FOREWORD**

For the first time, Jubilee Centre for Medical Research facilitates all researchers of Jubilee institutions to showcase their research ideas and ongoing works on the auspicious occasion of the Jubilee Research Day, in connection with the decennial celebrations of the establishment of the Research Centre. The Jubilee Research Day is exclusively conducted for Jubileans to interact with fellow researchers and discuss with their novel findings. It is a fountainhead for new ideas, thoughts, concepts and innovations which will be translated into discoveries at a later date. This will be a recurring event in the coming years.

As a part of Jubilee Research Day celebrations, I would like to present the abstracts of the selected research works conducted at Jubilee institutions during the last one year. I take this opportunity to thank all author for their contribution to this book. I hope this book will encourage further research and anticipate the participation of more researchers in the coming years. Although this book contains a small part of the research work carried at Jubilee, I do hope that the readers will get an idea of the excellent works that is going on here.

I wish to congratulate and mark my gratitude to the entire team of JCMR for their dedication & commitment for celebrating the Jubilee Research Day.

I expect the continued support from all Jubileans in our future endeavours.

Dr. D M Vasudevan  
Research Director

## **JUBILEE CENTRE FOR MEDICAL RESEARCH**

Jubilee Centre for Medical Research (JCMR) is the central research facility of all the institutions under the Jubilee Mission Hospital Trust. This is a DSIR recognized and KUHS approved research center. It is a recognized center by Ministry of finance u/s 351(ii) to receive donations and Ministry of Corporate Affairs for carrying out CSR activities.

JCMR is established by the Jubilee Mission Hospital Trust. The other Institutions under the Trust are the following.

1. The Jubilee Mission Medical College Hospital established in 1951 and now one of the largest hospitals in Kerala with a 1500 beds inpatient capacity and 1750 out patients per day with 32 specialty departments. Also offers DNB programme of Central Board.
2. Jubilee Mission Medical College affiliated to Kerala University of Health Sciences (KUHS) Medical College offers MBBS course, 18 MD/MS courses and 2 DM programmes.
3. Jubilee Mission College of Nursing, B.Sc & M.Sc nursing courses
4. Jubilee Mission School of Nursing
5. Jubilee Ayurveda Mission Hospital & Research Institute
6. Jubilee Mission College of Allied Health Sciences

To involve in research activities, along with clinical practice, is a commitment of faculty and students of these institutions. The faculty and students are actively participating in various research programs funded by government and private sectors and the parent institution. JCMR has completed several research projects funded by ICMR, DRDO, DST, DHR, KSCSTE etc. Currently there are 13 external funded research projects. JCMR has central minister recognized Human and Animal Ethical Committee. Ph.D programs in the faculty of Medicine, Nursing, Paramedical & Allied Health Sciences are undertaken.

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# **BREAKING BARRIERS AND NURTURING ACCEPTANCE: UNDERSTANDING SCHOOL TEACHERS' KNOWLEDGE AND AWARENESS ABOUT LGBTQ+ COMMUNITIES**

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## **Background**

In recent years, even though the LGBTQ+ community has gained increased visibility and recognition, they are still constantly facing disparities related to social stigma and denial of human rights. Among the youths, the upper primary and high school educational period is a crucial period in their life as it is the time where he/she identifies themselves. School teachers have a crucial role in creating a safe and supportive environment for LGBTQ+ students during this period.

## **Aim**

To explore the level of knowledge and awareness among school teachers regarding LGBTQ+ communities and their rights, with the ultimate goal of developing strategies to improve teacher education and support for LGBTQ+ students.

## **Objectives**

1. To evaluate the knowledge of school teachers' about LGBTQ communities and their rights.
2. To evaluate the awareness of school teachers' about LGBTQ communities and their rights.

## **Methodology**

This cross-sectional study was done among school teachers in Thrissur, Kerala under the Department of Physiology. A total of 17 schools in Thrissur were included in the study. 255 participants of age group 23 to 60 years were selected for the study based on convenient sampling techniques. A semi validated questionnaire was distributed among school teachers of high school and upper primary classes. Based on the scores obtained they were categorized as good, average and

poor. Chi square test was used for the analysis.

### **Results**

Among the total respondents 56.5% had average knowledge and 53.7% had poor awareness. Even though most of them have better knowledge, their awareness level was very poor which was statistically significant. The survey also demonstrated that as the age increased, knowledge and awareness decreased. On analyzing each knowledge question, it was identified that the majority were having knowledge about the LGBTQ terminologies. Only 15.7% knew what intersex was where 36.9% knew what 'sex' refers to. Most of the teachers were not sure about what is sex and gender and are intermixing these terms. Among awareness questions, 62.4% of teachers were aware that being LGBTQ+ is not a disease.

### **Conclusion**

This study depicts the lack of proper knowledge and awareness among school teachers regarding LGBTQ. Sex education should begin from the root level i.e., from schools in order to provide a safe environment for LGBTQ youths which promotes better academic outcome and overall well-being. Lack of knowledge and awareness is a threat to the developing society so we should conduct awareness sessions and classes for the teachers to improve their knowledge and awareness. It is our collective responsibility to ensure that all students, regardless of their sexual orientation or gender identity, feel seen, heard, and valued in our schools.

## **PREVALENCE OF PROBABLE DEPRESSION AMONG HCWS IN A TERTIARY CARE HOSPITAL DURING QUARANTINE OF COVID-19 PANDEMIC- A CROSS SECTIONAL STUDY**

Been Johns<sup>1</sup>, Ashley Elza Biju<sup>1</sup>, Anson Anto<sup>1</sup>, Archana Jayshanker<sup>1</sup>,  
Aysha Hasna<sup>1</sup>, Bhama J<sup>1</sup>, Teny Attokaran<sup>2</sup>

<sup>1</sup>MBBS Student, <sup>2</sup>Department of Community Medicine, JMMC&RI

### **Background**

SARS-CoV2 was 1<sup>st</sup> reported in Wuhan, China in December 2019. Globally, as of September 2021, there have been 228 million confirmed cases of SARS-COV2 and 4.6 million deaths reported to WHO. In Kerala, methods such as contact social distancing, home quarantine and increased vaccinations have led to a significant decrease of the disease. However, the pandemic had resulted in the prevalence of mental health problems especially in HCWs which would negatively affect their attention, cognitive functioning and clinical decision making, leading to a subsequent increase in the incidence of medical errors thus putting patients at risk. Therefore, the mental health problems of HCWs during COVID- 19 pandemic quarantine have become an urgent public health concern.

### **Objectives**

- To estimate the prevalence of probable depression among HCWs in a tertiary care hospital during quarantine of COVID- 19 pandemic.
- To assess the severity of probable depression among the HCWs.

### **Methodology**

This Cross sectional study was conducted among 173 HCWs who were in quarantine during July – September 2021 and willing to participate and had given consent in Jubilee Mission medical College and Research Institute. The exclusion criteria consisted of HCWs who were already diagnosed with mental disorders.

We collected the list of health care workers in JMMC & RI who were in quarantine between the months July- September 2021 and contacted them. Consent was taken from each participant after getting ethical clearance. The objective of the study was explained and they were requested to fill a predesigned google form consisting of a standard questionnaire – PHQ-9, sent via WhatsApp for data collection.

The questionnaire consists of 16 questions, in which 7 questions gave the personal details of the individual which included age, gender, medical sector, type and previous history of quarantine as well as the details of being tested positive for COVID-19 whereas 9 questions were from PHQ-9. The names of the HCWs were kept confidential. The data was further analyzed and exported from the Google Forms and converted to Microsoft Excel spreadsheet and coded. Statistical analysis was performed using SPSS and presented as frequencies & percentages and represented in form of pie and bar diagrams.

## **Results**

From the cross-sectional study conducted among the health care workers who have undergone quarantine in JMMC & RI the prevalence of probable depression among them was found to be 58.4 %.

On assessing the severity of depression, 5.2 % suffered from severe depression.

## **Conclusion**

This study showed a high prevalence of probable depression among HCWs during COVID – 19 quarantine that affected all workers regardless of different socio-demographic characteristics.

## **ANXIETY AND RESILIENCE AMONG DOCTORS TREATING COVID 19 PATIENTS: A CROSS SECTIONAL STUDY FROM SOUTH INDIA**

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<sup>1</sup>House Surgeon, <sup>2</sup>Department of Psychiatry, JMMC & RI

### **Background**

The stresses related with COVID-19 on healthcare employees, including the disease burden on the healthcare system, and the infection risk can be considered as the important effects of this global pandemic. Resilience is positive adaptation despite experiencing adversity. This research focused to determine the prevalence and influence of resilience on anxiety among doctors while treating COVID-19 patients

### **Objectives**

- To evaluate the level of Anxiety and resilience among doctors treating COVID-19 patients in South India
- To assess the effect of selected socio-demographic, work related and COVID-19 related variables on resilience and anxiety among doctors treating COVID-19 patients in South India
- To determine the relationship between the resilience and anxiety among doctors treating COVID-19 patients in South India

### **Methodology**

A Web - based cross sectional study was conducted among doctors treating COVID-19 during the month of April (12<sup>th</sup>-30<sup>th</sup>), 2021 amid the second wave. The study had a sample size of 135. The study was conducted in COVID-19 centres of South India using snowball sampling method. The doctors on COVID-19 duty (directly in contact with COVID-19 patients) were included and those who are suffering from any psychiatric illness in the past are excluded. After obtaining approval from the Institutional Ethics Committee, a pre-designed structured questionnaire was distributed digitally as Google Forms.



Variables like socio-demographic, work related and COVID-19 related were assessed along with anxiety and resilience using GAD 7 and CD RISC questionnaires respectively. After taking informed consent, data was collected, coded and entered in MS EXCEL and analyzed in IBM SPSS version 25

## Results

Among the 135 subjects, nearly half (43.7%), belonged to the age group <35 years and 60% were males. Out of 135 doctors, 36.3 % severe anxiety, 34.1 % moderate anxiety, 14.8% mild anxiety and the remaining 14.8% no anxiety. Majority (74.8%) of the participants have crossed the best cut off score of 21.5 of resilience .There is statistically significant difference in anxiety scores across age groups. Higher anxiety score was found in married category. Low levels of anxiety were seen in the least experienced group <10yrs which may be attributed to their lesser knowledge of the consequences. Lesser anxiety score in doctors working in well-equipped COVID wards which points out the importance of infrastructure in reducing stresses. Anxiety score in the doctors facing scarcity of equipment was statistically significant ( $U = 1546, p = .002$ ). .Doctors from rural areas had statistically significant higher resilience. There was a moderate positive correlation between anxiety and resilience, which was highly significant; it shows the need for resilience training.

## Conclusion

The study puts forward protection of mental health of doctors as a necessity to be addressed. Despite having higher resilience, doctors are suffering from anxiety. Early screening for anxiety and implementing interventions which includes improvement in the infrastructure, aimed at combating and reducing the presence of factors associated with increased anxiety is a necessity. The positive adaptations to stresses and adversities are very important for sustainable development of healthy minds.

## **THE PREVALENCE OF OCCUPATIONAL BURNOUT AMONG RESIDENT DOCTORS IN A PRIVATE MEDICAL COLLEGE, CENTRAL KERALA: A SURVEY BASED STUDY**

Jaziya Jabeen<sup>1</sup>, Indu K Gopi<sup>2</sup>, Varghese P R<sup>2</sup>

<sup>1</sup>MBBS Student, <sup>2</sup>Jubilee Centre for Medical Research, JMMC& RI

### **Background**

Burnout is a psychological syndrome characterized by over-whelming physical & mental exhaustion and a feeling of lack of accomplishment leading to decreased professional efficacy. According to WHO, burn-out is included in the ICD-11 as an occupational phenomenon and not classified as a medical condition.

### **Objectives**

- To assess the prevalence of occupational burnout among resident doctors in a private medical college, Central Kerala
- To identify factors contributing to occupational burnout among resident doctors

### **Methodology**

A descriptive cross-sectional study was conducted among 114 resident doctors using The Copenhagen Burnout Inventory (CBI) a validated 19 item questionnaire with questions on burnout divided into 3 scales – personal, work related and patient related. First part of the survey dealt with demographic & personal profile including - name, age, sex, family structure, residents' specialty, experience, emergency duties in the past month and negative life event in the past year. The second part had 19 questions divided into 3 parts - Personal burnout (6 items), work related burnout (7 items) and client related burnout (6 items). The third part was a checklist consisting of possible factors contributing to burnout identified by extensive literature search. The data was entered in excel 2007 and analysed in IBM SPSS Version 25. Descriptive statistics and correlation were run. The burnout scores were categorized into mild, moderate, high,

and severe based on quartiles of total score.

## Results

More than half (65.8%) of the residents experienced moderate burnout. Around 15% had high burnout. The prevalence of burnout in personal, work related and patient related dimensions of the CBI revealed that 44.7% had high personal burnout, 63.2% had moderate burnout on work related scale and 42.1 % reported moderate burn out on patient related scale. Feeling of loneliness, lack of adequate support system, discrimination or harassment at workplaces, specialties causing excessive workloads, lack of confidence in the psychological care of patients, overall lack of confidence in dealing with patients correlated with both work related and patient related burnout ( $p<0.05$ ) and consequently on total burnout. Pressure of malpractice suits recorded high personal burnout scores ( $p=0.027$ ), spending time at home on work related affairs, decreased control over work environment and long working hours showed significant work related burnout ( $p<0.05$ ) while frequent call duties recorded high patient- related burnout( $p=0.036$ ).

## Conclusion

The mental wellbeing and physical health of the resident doctors need to be prioritized. Negligence in addressing these issues leads to suboptimal patient care, medical errors and low quality health care. Assessment of more correlates are required and implementation of evidence based interventions are an absolute necessity to bring about policy level interventions, training methodologies and a healthy work environment to ensure the quality of health care system in our country.

## **EFFECT OF PLANNED TEACHING PROGRAMME ON KNOWLEDGE ON DASH DIET AMONG HYPERTENSIVE PATIENTS IN SELECTED WARDS OF JMMC & RI, THRISSUR**

Aiswarya Thomas<sup>1</sup>, Ajitha Anto C<sup>1</sup>, Alfia Sajid<sup>1</sup>, Angel Davis<sup>1</sup>,  
Anitta Sunny<sup>1</sup>, Anjana Daison<sup>1</sup>, Betty Baiju<sup>1</sup>,  
Jacquelin Joby<sup>1</sup>, Rincy P R<sup>2</sup>

<sup>1</sup>B.Sc Nursing Student, <sup>2</sup>Surgical Nursing Dept, JMCON

### **Background**

Clinicians have seen a rise in diseases, including hypertension, diabetes, obesity, and coronary artery disease. Studies have proved that the risk factors of hypertension fortunately can be controlled to an extent by utilizing the DASH diet.

### **Objectives**

The Present study was conducted to assess the level of knowledge on DASH diet, to determine the effect of planned teaching programme on DASH diet and to associate socio demographic and clinical data variables with pre-test level knowledge on DASH diet among hypertensive patients

### **Methodology**

The study was conducted in a quantitative approach. The target population was the hypertensive patients accessible in the selected wards (cardiology and nephrology) of JMMC & RI, Thrissur. The research design was Quasi experimental. The technique involved in sampling was simple random sampling. A total of 40 samples were selected for the study. The data was collected by administering self-structured questionnaires before and after planned teaching programme and was analysed using descriptive and inferential statistics.

### **Results**

#### *1. To assess the level of knowledge on DASH diet*

The overall distribution of samples showed the majority

of samples, 30 gained moderate knowledge in pre-test whereas 35 gained adequate knowledge in post -test. About 25 patients had inadequate knowledge on introduction in pre-test whereas 37 had adequate knowledge in post-test. About food units, 1 had inadequate knowledge in pre-test whereas 37 had adequate knowledge in post-test. About guidelines, 14 of patients had inadequate knowledge in pre-test whereas 35 had adequate knowledge in post-test.

### *2. To find the effect of planned teaching programme on DASH diet*

The mean pre-test knowledge score for introduction was 4.23 which was increased to 8.88 in the post-test. Mean knowledge score on food units was higher in the post-test (9) as compared to that in the pre-test (6.75). Mean knowledge score for guidelines was 5.13 which was raised to 9 in the post-test. It was evident from the results that the overall mean post-test score (26.88) was significantly higher than the mean pre-test knowledge (16.10).

### *3. To associate socio demographic and clinical data variables with pre-test level knowledge on DASH diet*

The study findings show that, age of the patients ( $\chi^2 = 6.533$  and  $p = 0.004$ ) was statistically associated with the pre-test level of knowledge. Gender, occupation, dietary pattern, family history of hypertension, duration of illness, on regular medication, any other comorbidity ,previous knowledge about DASH diet had no association with pre-test level of knowledge.

## **Conclusion**

The current study proved that there was a significant increase in the level of knowledge regarding DASH diet after the planned teaching programme and a significant association between age and pre-test level of knowledge of hypertensive patients. Thus a planned teaching programme is an effective educational intervention in improving the knowledge on DASH diet among hypertensive patients.

**IMPACT OF PANDEMIC RESTRICTIONS ON THE  
PSYCHOSOCIAL WELLBEING AMONG SCHOOL  
GOING CHILDREN IN PEDIATRIC WARD AND  
OUTPATIENT DEPARTMENT  
OF JMMC & RI, THRISSUR**

Amala Babu.A <sup>1</sup>, Amala Shilppa Benny <sup>1</sup>, Amitha Shaju <sup>1</sup>, Angela Biju <sup>1</sup>, Emil Varghese <sup>1</sup>, Gloria G Tharakan <sup>1</sup>, Jacquilin Nelson <sup>1</sup>,  
Liviya J Rose <sup>1</sup> Suja Ann Joseph <sup>2</sup>, Treasa Anto<sup>2</sup>,  
Angela Gnanadurai<sup>3</sup>

<sup>1</sup>B.sc Nursing students, <sup>2</sup>Dept of Pediatrics, <sup>3</sup>Medical Surgical Dept,  
JMCON

### **Background**

The COVID-19 pandemic and related restrictions have affected the wellbeing of schoolchildren worldwide.

### **Objectives**

- To assess the impact of pandemic restrictions on psychosocial well-being among school going children.
- To find the association between selected socio demographic variables and impact of pandemic restrictions on psychosocial wellbeing among school going children

### **Methodology**

The study was conducted among 100 school going children in pediatric ward and outpatient department of JMMC&RI, Thrissur. The research design used was descriptive design and sampling technique was purposive sampling. Data collected through questionnaires. Tool was divided in to two sections, section A– sociodemographic and clinical data questionnaire and section B- Modified Multi-dimensional student life satisfaction scale.

### **Result**

Out of the 100 samples, 53% children belonged to the age group of 10-12 years, 60% were males, 41% belonged to Muslim community, half of them were in Vth standard, 57% were in state syllabus. The fathers among the study group, 49%

belonged to the age group of 31-40 years, 27% had educational status of both primary and secondary education, 96% are working. Among the mothers, 61 belonged to the age group of 31-40 years, 33% had educational status of degree, 75% were not working. Among the study group, 52% had the income between Rs.15,000-25,000. Among the study group, 76% belonged to nuclear family, 55 % stayed with grandparents, 63 had no COVID-19 history, 57% had knowledge about COVID-19 and 95% has no significant history of mental/social illness. The overall distribution of samples showed 55% has moderate psychosocial well-beings, 45% has high psychosocial well-being and none had low psychosocial well-being. There was significant association ( $p < 0.05$ ) between socio demographic variable sex ( $\chi^2 = 5.093$ ,  $p < 0.023$ ) with psychosocial Well-being of school going children. Out of 100 samples there were 574 (14.35%) who had given the response as 'Never', 357 (8.92%) as 'Sometimes', 595 (14.88%) as 'Often', 2474 (61.85%) as 'Almost often' to the questionnaire given in the modified multidimensional students life satisfaction scale. From the scoring, we found that 55% had moderate psychosocial well-being and 45% had high psychosocial well-being. Moreover it was observed that there is no evidence of low psychosocial Well-being among school going children during the pandemic restriction time. As compared to the male children, female children had high psychosocial well-being.

## Conclusion

In the present study the investigation team found that majority of school going children had moderate psychosocial well-being during the COVID -19 pandemic restriction period. Moreover we found that there is no evidence of low psychosocial well-being among school going children during the pandemic restriction time period. As compared to the male children, female children have high psychosocial well-being.

## ASSESSMENT OF LEVEL OF QUALITY OF SLEEP AMONG POST-OPERATIVE PATIENTS ADMITTED IN JMMC & RI, THRISSUR

Anna Aneena Alby<sup>1</sup>, Anitta Joy<sup>1</sup>, Ashwathy V<sup>1</sup>, Aleena Saju<sup>1</sup>,  
Ancy E S<sup>1</sup>, Chanchal Chacko<sup>1</sup>, Fousitha H S<sup>1</sup>,  
Aneeta Agustin<sup>1</sup>, Daisy Maria<sup>2</sup>

<sup>1</sup> B.Sc Nursing Students, <sup>2</sup>Medical Surgical Department, JMCON

### Background

Post-operative patients are vulnerable to poor sleep quality. This study was conducted to assess the level of quality of sleep among postoperative patients admitted in JMMC &RI, Thrissur

### Objectives of the study

- To assess the level of quality of sleep among postoperative patients admitted in JMMC &RI Thrissur
- To associate sociodemographic and clinical data variable with level of quality of sleep among postoperative patients admitted in JMMC &RI Thrissur.

### Methodology

The study was conducted in a quantitative non experimental research approach. The research design was Descriptive design. The target population was the Post-operative patients admitted to the general surgery ward of JMMC&RI. The technique involved in sampling was purposive sampling. A total of 91 samples were selected for the study. The data was collected by administering self-structured questionnaires and was analyzed using descriptive and inferential statistics.

### Result

- *To assess the level of quality of sleep among postoperative patients*

The study showed that majority of patients 63 (69.23%) had adequate sleep and 28 (30.76%) had inadequate sleep. These findings are supported by a non-experimental descriptive study



was conducted on 2018 to assess the quality of sleep on cardiac patients admitted in cardiac ward. There were 30 samples selected having age above 40 years & below 18years by purposive sampling technique from selected cardiac. Demographic & clinical data variables & Pittsburgh sleep quality index scale were used. The findings of the study showed that 73% of patients had adequate quality of sleep & 27% of them had inadequate quality of sleep in cardiac patients.

- *To Associate Sociodemographic and Clinical data variable with level of quality of sleep among postoperative patients*

There was a significant association ( $p = 0.001$ ) between quality of sleep and sleeping hours. There were significant association between quality of sleep and post-operative pain. Also there were significant association ( $p=0.001$ ) between sleep quality and sleep disturbances. It was also evident that there is no association between quality of sleep and other socio-demographic and clinical data variables among post-operative patients.

### **Conclusion**

The study shows that majority of patients 63 (69.23%) have adequate and 28 (30.76%) have inadequate sleep. At the end of the study the investigation team found that majority of patients had sleep disturbances during the fifth postoperative day. The sleep disturbance is associated with sociodemographic and clinical data variables. Some of the suggestions for improving post-operative sleep are doing deep breathing exercises, practicing progressive muscle relaxation techniques, taking pain medicines 30 minutes before bedtime, maintaining a quiet and dim environment, and decreasing interruptions from care activities at night. Taking a shower or bath, or listening to music, sharing concerns may also induce sleep.

## **EFFECTIVENESS OF TAI-CHI EXERCISE ON LEVEL OF STRESS REGARDING THE IMPACT OF COVID-19 AMONG CAREGIVERS OF IN-PATIENTS OF SELECTED WARDS AT JMMC & RI, THRISSUR**

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### **Background**

COVID-19 pandemic has posed a significant threat to both physical and mental health of an Individual. Tai-Chi is a therapeutic exercise that can be used to treat anxiety disorders.

### **Objectives**

- To assess the level of stress regarding the impact of COVID-19 before and after Tai Chi exercise among caregivers of in-patients.
- To associate the pre-test level of stress with selected socio-demographic and clinical data variables.

### **Methodology**

A quantitative research approach was adopted for the study. Quasi experimental research design was selected and the study was conducted on selected wards (male medical, male surgery, female surgery, psychiatry) at JMMC & RI Thrissur. A total of 40 caregivers of in-patients were selected through convenience sampling. The standardized questionnaire Perceived Stress scale was used to assess the level of stress among caregivers of in-patients. Descriptive and inferential statistics were used to analyze the study.

### **Results**

*1. To assess the level of stress regarding the impact of COVID-19 before and after Tai-chi exercise among caregivers of in-patients*

By using perceived stress scale to assess the level of stress regarding the impact of COVID-19, we found that in pretest majority of the care givers have about 34 (85%) had moderate stress, 6 (15%) had high stress and none had low stress. After intervention, about 39 (99%) had low stress, 1(1%) had moderate stress and none had high stress. There was a significant difference ( $p = 0.001$ ) between Pre-test and Post-test the level of stress regarding the Impact of COVID-19 among caregivers of inpatients of selected wards. The difference of standard deviation after Pre-test and Post-test was 3.997. So there was a significant difference between the pretest and Post-test level of stress regarding the impact of COVID-19 among the caregivers of in-patients of selected ward at JMMC & RI.

## *2. To associate the pretest level of stress with selected socio-demographic and clinical data Variables*

The findings of the study shows that there was no significant association ( $P < 0.05$ ) between the level of stress regarding the impact of COVID-19 among the caregivers of inpatients with the selected socio–demographic and clinical data Variables.

## **Conclusion**

This study had assessed the effectiveness of Tai-Chi exercise on level of stress regarding the impact of COVID-19 among the caregivers of in-patients of selected ward at JMMC & RI. The study shows that Tai-Chi exercise is effective in reducing the level of stress regarding the impact of COVID-19 among caregivers of in-patients. Thus Tai-Chi exercise could be utilized in clinical setting as well as their personal life to reduce the level of stress among patients and their caregivers.

## **KNOWLEDGE AND ATTITUDE TOWARDS COVID-19 VACCINATION AMONG THE ADULT POPULATION VISITING JMMC & RI, THRISSUR**

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### **Background**

As COVID-19 spread across the world, vaccines were developed to fight against the spread of the new disease. The knowledge and attitude of the recipients can influence vaccine acceptance. This study was conducted to assess the knowledge and attitude towards COVID-19 vaccination among the adult population visiting JMMC & RI, Thrissur.

### **Objectives:**

This study was conducted

- To assess the level of knowledge towards COVID-19 vaccination among the adult population,
- To assess the attitude towards COVID 19 vaccination among the adult population,
- To associate between knowledge regarding COVID 19 Vaccination with selected demographic variables
- To associate between the attitude towards COVID 19 vaccination with selected demographic and clinical data variables and
- To correlate between the knowledge and attitude towards COVID 19 vaccination.

### **Methodology**

The study was conducted on a sample size of 100, among the adult population of both the gender between the age group 18 to 60 years visiting the COVID 19 vaccination center of JMMC & RI. The research design of the study was descriptive design and the sample was selected by non-probability

purposive sampling. The tools used were self-structured questionnaire & attitude scale. The data was analyzed by both descriptive & inferential statistics.

## **Result**

### *1. To assess the level of knowledge towards COVID 19 vaccination among the adult population visiting JMMC&RI*

On assessment 64% of the participants had adequate knowledge about COVID 19. Among the study group, 92% had good knowledge about COVID 19 vaccination, 67% of the participants had adequate knowledge before COVID 19 vaccination, 56% of the participants had adequate knowledge during COVID 19 vaccination, 57% of the participants had good knowledge after COVID 19 vaccination. In overall about 50% of participants had good knowledge.

### *2. To assess the attitude towards COVID 19 vaccination among the adult population visiting JMMC&RI*

Among the total study population 66% showed moderately favorable attitude, 18% had favorable attitude and 16% had unfavorable attitude towards COVID 19 vaccination.

### *3. To associate between knowledge regarding COVID 19 Vaccination with selected demographic variables*

Result reveals there was no significant association ( $p>.05$ ) with overall and knowledge of people and with each domain regarding COVID 19 vaccination.

### *4. To associate between the attitude towards COVID 19 vaccination with selected demographic and clinical data variables*

Study found that there was a significant association between education ( $P=0.006$ ) and attitude towards COVID 19 vaccination. People with higher education had more favorable attitude towards COVID 19 vaccination.

### *5. To correlate between the knowledge and attitude towards COVID 19 vaccination.*

Study revealed that there was moderately positive correlation at 0.01 level ( $r$  value =0.307,  $p$  value=0.002). Therefore as the knowledge level increases more favorable attitude was observed among the population.

### **Conclusion**

The present study was conducted to assess the knowledge and attitude towards COVID 19 vaccination among the adult population visiting JMMC & RI, Thrissur. After statistical analysis the researcher found that there is a moderately positive correlation at level 0.01 between the knowledge and attitude. It concludes that as the educational status and knowledge level of the population increases the favorable attitude towards COVID19 vaccination also increases.

## **ASSESSMENT OF THE QUALITY OF LIFE AMONG POSTMENOPAUSAL WOMEN IN SELECTED WARDS OF JMMC & RI, THRISSUR**

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### **Background**

Menopause is a physiological event in the women's life. The transition through menopause is a life event that can profoundly affect quality of life. The objectives of the study were to assess the quality of life among postmenopausal women and to associate quality of life among postmenopausal women with selected socio-demographic and clinical data variables.

### **Methodology:**

A descriptive study was conducted among 30 postmenopausal women. Sample was selected using non probability convenience sampling technique. Standardized Menopause Specific Quality Of Life Questionnaire (MENQOL) was used to assess the quality of life of postmenopausal women.

### **Results:**

In socio demographic findings, 56.66% of the study population were 56-60 years old and half of them, 15 (50%) were Hindus. While 21(70%) belonged to nuclear family, 18(60%) had primary education and 27 (90%) were married. 21 (70%) were house wives and 18 (60%) of them had income less than Rs 5000 and 29 (96.66%) were living in rural areas. Among the study group, 24 (80%) had attained menopause at an age group of 45-50 years and 29(86.66%) had knowledge about menopausal symptoms. The study reveals that 17(56.66%) women had good quality of life, 12(40%) of them had average quality of life and only 1(3.33%) sample had poor quality of life. In component wise analysis of postmenopausal symptoms in,

vasomotor symptoms 11 (36.66%) were being dissatisfied with their personal life, 9(30%) were experiencing severe hot flushes, 10(33.33%) were experiencing severe sweating, in psychosocial symptoms 12 (40%) of them had night sweats 12(40%) had moderate feeling of anxious or nervous. In physical symptoms, 10 (33.33%) had severe aching in muscles and Joints, 14(46.66) had moderate feeling tired or worn out, 20(66.6%)had no increased facial hair,8(26.66%) had moderate low back ache,8(26.66%)had no difficulty sleeping,12 (40%) had moderate lack of energy, 18 (60%) had no weight gain.12 (40%) had moderate dry skin. In sexual symptoms 12 (40%) of them had change in their sexual desire. There was a significant association between sociodemographic and clinical data variables such as nuclear family (p value=0.013,  $p<0.05$ ) with quality of life among postmenopausal women. This indicates that women lived in nuclear family had increased quality of life.

### **Conclusion:**

The postmenopausal women suffer from vasomotor, psychosocial, physical and sexual symptoms. The study concluded that, the postmenopausal women belonged in nuclear family maintained good quality of life than that of women in joint family. In rural areas of Kerala, we found that the type of family had a higher influence in maintaining good quality of life among postmenopausal women. Hence educating the family members promote the quality of life of postmenopausal women in an adequate way.



## ASSESSMENT ON ORAL HEALTH STATUS AND CONTRIBUTING FACTORS AFFECTING THE ORAL HEALTH AMONG SCHOOL CHILDREN

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### Background

School children have a high prevalence of oral health problems. This study was conducted to assess the oral health status and contributing factors affecting the oral health among school children.

### Objectives

- To assess the oral health problems of school children
- To assess the contributing factors affecting the oral health of the school children
- To find out the correlation between oral healths problem with contributing factors.
- To find out association between oral health status with selected socio demographic variables

### Methodology

The Study was conducted in a quantitative research approach. Research design was non experimental descriptive research design. Target population was school aged children. The sample was School aged children at 7-12 years old from St. Joseph's Model Higher Secondary School Kuriachira, Thrissur. Technique involved in sampling was convenient sampling technique. Sampling size was 100 school aged children.

### Results

In socio-demographic findings, 98 of school aged children were at the age group of 11-12 years, 66(of them were male. And 60 of them were Christian. While 72 were belonged to nuclear family, 68 of them were APL, 49 of parents had higher

secondary level of education, 84 lived in urban areas. Among the study group, 53 of children had 16-22 number of teeth, 33 started tooth-brushing at an age group of 1-2 years and 79 of them had previous oral health awareness from parents.

The study found that 34 of school children had moderate oral health problems, 7 of school children had severe oral health problems and 59 of school children had mild oral health problems.

This study also found that based on factors affecting oral health, 76 had good oral health practice, 22 had satisfactory oral health practice and 2 have poor oral health practice.

The OHAT (Oral health assessment tool) reveals that 54% of school aged children had changes in oral health status, 46% of them have healthy oral health status, and none of them were unhealthy.

There was a positive correlation between oral health problems and the contributing factors affecting oral health, p value was 0.3694. It indicates children's following good oral health practice have mild oral health problems. There was no significant association between sociodemographic variables with oral health status.

## **Conclusion**

At the end of the study investigator found that there was significant correlation between contributing factors affecting the oral health and the oral health problems (p value is 0.3654). It concluded that as contributing factor affecting oral health increases more the oral health problem.

## **THYROID DISORDERS IN PREGNANCY AND ITS FETAL OUTCOMES- A CROSS- SECTIONAL STUDY**

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### **Background**

Thyroid disorders are one among the most common endocrine disorders in women of reproductive age group, affecting 5-7% of all pregnancies. In countries like India with high prevalence of Thyroid disorders, early diagnosis and prevention are crucial for ensuring optimal fetal health outcomes. TSH is included in routine antenatal investigations in Kerala, yet the prevalence of thyroid disorders remains significantly high, affecting the neonatal outcomes.

### **Objectives**

- To estimate the prevalence of thyroid disorders in pregnancy in a tertiary care setting in Thrissur
- To analyze the effect of thyroid status on fetal outcomes
- To determine the factors associated with thyroid disorders in pregnancy

### **Methodology**

A Cross-sectional study was conducted in Jubilee Mission Medical College Hospital based on the medical records of antenatal women admitted to the Gynecology ward for delivery during the year 2022. Based on the prevalence of Thyroid disorders (31.6%) observed in an earlier publication of Kumar R et.al, with 20% relative precision, minimum sample size was calculated to be 216. A total of 226 samples were taken based on availability. 226 women with singleton pregnancy and complete medical records were selected from the hospital registry by Convenience sampling. Details of the participants including age, comorbidities, clinical and investigation details of present pregnancy along with mode of delivery and status of

the baby were collected using structured Questionnaire. The collected data was then analyzed using SPSS version 25 and Chi-square test was used to determine the statistical association between categorical variables.

## Results

Among the antenatal women, 69.9% (n= 158) were in the age group of 20-29 years and 46% (n=104) of them were prime-gravida. Mean birth weight of babies were observed to be  $2.97 \pm 0.43$  and 8.8% (n=20) had birth weight less than 2.5kg. Prevalence of Thyroid disorders in pregnancy based on the first trimester TSH value is 27% (n=61), were 25.2% (n=57) had Hypothyroid status. 9.3% (n= 21) of the women had a previous history of Hypothyroidism. Maternal factors such as age, parity, comorbidities, gestational age of delivery found to have no association with the Thyroid dysfunction in first trimester of pregnancy. With respect to foetal outcomes, low birth weight had a significant statistical association with Thyroid dysfunction in pregnancy (p=0.020). No such significant association was found with other foetal complications like still birth or foetal admission following delivery.

## Conclusion

Prevalence of Thyroid dysfunction in first trimester of pregnancy is 27% with high incidence of hypothyroidism. This can have a significant impact on the health status of the baby with birth weight being particularly affected. Therefore, early screening and management of thyroid disorders during pregnancy is essential to improve the quality of maternal and fetal care.

## **IMPACT OF COVID-19 PANDEMIC ON UTILIZATION OF PALLIATIVE CARE SERVICES IN THRISSUR**

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### **Background**

Palliative care is medical care to improve individuals with serious illnesses that impair daily functioning or quality of life. It also decreases caregiver's burden through pain, symptom management and support. Globally, in 2020, an estimated 56.8 million people require palliative care each year, and only 14% received it. A total of 5.4 million people in India, needed palliative care services, but less than 1% received them in 2020. The need for palliative care is increasing due to the ageing population and the increasing incidence of lifestyle or non-communicable diseases. In December 2019, the COVID-19 infection developed and spread worldwide. The COVID-19 pandemic has severely impacted healthcare services, which have been transformed to treat COVID-19 patients. The COVID-19 situation has caused increased mortality and morbidity in high-risk individuals, masking the importance of palliative care services. Palliative care services were severely affected during the COVID-19 pandemic due to the stringent social distancing and lockdown measures instituted.

### **Objective**

To assess the utilization patterns in palliative care service during the COVID-19 pandemic in the Thrissur district.

### **Methodology**

The cross-sectional study was conducted among 155 palliative care patients from seven centers in Thrissur district from March 2021 to August 2022. From each taluk, one palliative care center was selected by convenience sampling. Based on a random table method, palliative care patients were selected and interviewed using a semi-structured questionnaire

after getting their written consent. Statistical analysis- Data were analyzed by SPSS version 25. Numerical variables were expressed as means with standard deviations and categorical variables as frequencies with percentages. The impact was calculated in percentages (%) based on the difference between the pre-pandemic and pandemic phases.

## Results

The mean age of the participants was  $60.33 \pm 16.44$  years with most of them 49(31.6%) belonging to the age group of 61-70 years. Males and females were equally distributed in this study. Among the subjects, 69(44.5%) received any of the social security schemes available like old age pension 45(65.2%), disability pension 5 (7.3%) and widow pension 9(13%). The majority, 58 (37.4%) of patients were suffering from malignancies followed by cerebrovascular accidents 33(21.2%) and chronic kidney diseases 21(13.5%). There was a 100% reduction in the utilization of inpatient, rehabilitation, and emergency services by the participants. Physiotherapy service utilization reduced from 49 to 5 (89.8%), home care service utilization from 106 to 49 (53.7%) and outpatient services from 124 to 82 (33.8%) as compared to the pre-pandemic level. The reasons for the reduced utilization of palliative care services were because of the conversion of these centres to COVID-19 first-line treatment centres (CFLTCs,) Inpatient wards were converted into quarantine wards. Participants were unwilling to use palliative care services due to fear of COVID-19 infection, stringent social distancing, and lockdown measures during the pandemic. Teleconsultation utilization increased from 16 to 93(481.3%) during the pandemic.

## Conclusion

During the pandemic, all palliative care services were affected. Inpatient, rehabilitation, and emergency services were not utilized by the participants. Teleconsultation service utilization increased during the pandemic.

## **THE CLINICOPATHOLOGIC SPECTRUM OF MYCOSIS FUNGOIDES - A SINGLE CENTRE EXPERIENCE**

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### **Background**

Mycosis fungoides (MF) is the most common type of primary cutaneous T cell lymphoma (pCTCL). It is characterized by cutaneous infiltration of malignant monoclonal T-cell lymphocytes. The male to female ratio of this condition is 2:1. MF is known for its diverse clinical manifestations ranging from patches, plaques, papules and nodules, to ulcerated lesions progressing to involve the lymph nodes and blood. It mimics several inflammatory dermatoses making it difficult to diagnose it at an early stage.

### **Objective**

This study was conducted to give an insight to various clinical presentations, pathological and immunohistochemical (IHC) features of MF.

### **Methodology**

This was an observational study which includes diagnosed cases of MF from a tertiary care centre, highlighting their clinical presentations, histopathological and IHC features, treatment and outcomes. Seven patients were selected for the study; four males and three females. Their clinical presentations and histopathological features are studied and compared, along with the immunohistochemical features.

### **Results**

Seven patients diagnosed in the past 2 years (2021 & 2022) were evaluated (4 males and 3 females) with age ranging from 23 to 81 years. Among them, two patients presented with hyperpigmented scaly patches (29%), three with hypopigmented patches (42%), and two presented with erythematous papules (29%). Biopsy from hyper and hypopigmented lesions showed

epidermotropism with dermal atypical lymphocytic infiltrates (71%). Band like atypical lymphocytic infiltrate in the papillary dermis without epidermotropism was seen in patients with erythematous papular lesions (29%). All cases were confirmed by immunohistochemistry with the IHC markers CD45, CD3, CD5, CD7, CD4 and CD8. One patient with hypopigmented lesions had Sezary syndrome, with atypical lymphoid cells (sezary cells) in peripheral blood smear and was referred to a higher centre. Two patients were treated with PUVA therapy alone, two with PUVA therapy and topical steroids. Two patients expired due to disease progression.

### **Conclusion**

Mycosis fungoides simulates many non-neoplastic dermatological conditions and hence is a diagnostic challenge to most clinicians and pathologists. Recognising mycosis fungoides at an early stage is particularly important, because of its impact on treatment and prognosis. Awareness of the different atypical presentations of MF is important to avoid delay in diagnosis. Any long standing skin lesion resistant to treatment should be subjected to histopathological examination and IHC correlation to rule out primary cutaneous T cell lymphoma.



## BEYOND THE PRAKRITI PARADOX: FINDING COMMON GROUND IN AYURVEDA

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### Background

Recent developments in the field of Ayurveda have sparked the interest of many researchers, who seek to provide mechanistic insights to this ancient system of medicine using science and evidence-based approaches. The patient's Prakriti, a crucial element of Ayurvedic treatments, plays a vital role in determining an appropriate course of therapy due to its immutable characteristics. Prakriti influences variations in morphology, function, behavior, individual response to internal and external environmental stimuli, susceptibility to different diseases, etc. Hence, became a key determining factor in the treatment regimens. However, the accuracy and reliability of the various tools and approaches available for Prakriti assessment have been called into question, necessitating the need for validation.

### Aim

To evaluate the outputs of different questionnaires used for the Prakriti analysis and compare with that of physician's prediction.

### Methodology

We conducted a study to evaluate the outputs of different questionnaires used for Prakriti analysis. The Prakriti of 54 individuals were assessed using four different tools: questionnaires from IGIB (Q-IGIB) and BHU (Q-BHU), Ayusoft (a computational tool), and an evaluation by an Ayurveda physician (Q-Phy). Based on the scores obtained, the participants were categorized into 'ekadoshaja', 'dvandvaja', and 'sannipataja' Prakritis. We compared the scoring patterns of the

other tools with that of Phy-Q, given its direct intervention by an Ayurveda physician.

### **Results**

The Prakriti evaluations by various tools exhibited discrepancies, prompting us to revisit these tools and thoroughly study their properties. We found that the number of questions and the scoring pattern (weightage of marks provided to different questions) varied in each tool. Several overlapping choices are also found in the questionnaires, which have confused the subjects in answering the questions and might have reflected in the final output. Our findings revealed significant differences in the results of Ayurveda Prakriti evaluation, highlighting the need for a more reliable evaluation process.

### **Conclusion**

While looking into results, we suggest different steps towards a more reliable evaluation of Prakriti. These include standardizing the number of questions and the weightage of marks assigned to them in different questionnaires and ensuring adequate training of physicians in the evaluation of Prakriti. By considering the entire features, a standard operating protocol has to be introduced for the designing of a unique prakriti analyzing tool and it should introduce to Ayurveda community for further improvements. Our study underscores the importance of a consensus-based approach to Prakriti assessment to promote its widespread adoption and integration into clinical practice.

## **THE POTENT sQC INHIBITOR, SEN177 BLOCKS ACETYLCHOLINESTERASE ACTIVITY, INDICATING PROMISING ROUTE FOR THE DEVELOPMENT OF POLYPHARMACOLOGICAL LIGANDS FOR ALZHEIMER'S DISEASE**

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### **Background**

Alzheimer's disease (AD) is the most common type of dementia, leading to irreparable damage and neuronal death. The drugs available for AD patients produce only modest effects, and the WHO predicts that AD will become a global epidemic by 2050. Clinical trials for AD drugs showed a high rate of failure, and the multi-factorial nature of AD progression poses a major challenge to drug discovery. Multifunctional/ polypharmacological agents are thus needed to treat AD instead of single-targeted therapies. Acetylcholinesterase (AChE) and secretory glutaminyl cyclase (sQC) are potent drug targets involved in cholinergic and amyloidogenic pathways, respectively. AChE is responsible for the acetylcholine (ACh) hydrolysis and sQC mediates the formation of pyro-glutamine containing A $\beta$  (pGlu-A $\beta$ ). During AD, ACh levels are reduced, and AChE inhibitors help to restore ACh levels in the synaptic cleft. Similarly, the pGlu-A $\beta$  variant is highly toxic and abundant in the AD brain, and sQC inhibitors modulate A $\beta$  plaque formation. Hence the dual binders of AChE and sQC could improve cholinergic neurotransmission in the brain and prevent A $\beta$ -mediated neurotoxicity by reducing A $\beta$  load in the brain.

### **Aim**

Identification of polypharmacological ligands against sQC and AChE

### **Methodology**

To investigate the binding potential of sQC binders against AChE, XP docking was used, followed by enzyme

inhibition and Trp fluorescence quenching assays. Due to the moderate affinity of the compound towards AChE, a pharmacophore was created based on SEN177, and a pharmacophore-based screening was conducted against a CNS dataset (10 million compounds) from Chembridge database to identify new chemical entities that exhibit polypharmacological activities against sQC and AChE. Promising hits were then subjected to SP docking, followed by XP docking and binding energy calculations using Prime MM-GBSA against both enzymes using Schrödinger. To gain a better understanding of the binding stability of the compounds, molecular dynamics simulations were carried out using Desmond.

## Results and Conclusions

Molecular docking studies of sQC inhibitors, PBD-150 and SEN-177 against AChE showed that they have similar affinity towards AChE. From enzyme inhibition studies, it was found that the inhibitory potency of SEN177 is in the micromolar range against AChE, suggesting a possible route for designing dual inhibitors. A six-point pharmacophore consisting of two acceptors, a hydrophobic moiety, and three aromatic rings was generated and the screening of these pharmacophore against Chembridge database identified dual binders of sQC and AChE. Docking and simulations indicated that these ligands bind to the peripheral anionic site of AChE, which may prevent association with A $\beta$  and ACh hydrolysis. For sQC, the ligands interact with the catalytic Zn<sup>2+</sup> ion, thereby preventing the formation of pGlu-A $\beta$ . However, *in vitro* enzyme inhibition studies are necessary to confirm the inhibitory effect of the *in silico* hits.

## MECHANISTIC EXPLANATIONS FOR PROGESTERONE RECEPTOR PUTATIVE-DISEASE CAUSING MUTATIONS

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### Background

Progesterone (P4) is a crucial steroid hormone involved in the complex regulation of female reproductive functions, as well as having diverse tissue-specific effects in humans. The effects of progesterone are mediated through a motif known as the 'ligand binding domain', which is present in the progesterone receptor (PR), a member of the nuclear receptor family of ligand-dependent transcription regulators. The PR gene (PGR) encodes two isoforms, PR-A and PR-B, both of which are transcribed from a single gene. Variations in PGR are known to adversely affect the signalling mechanism of the cell. While some pathogenic mutations of the human PR gene have been previously reported, the missense mutations present in the Ligand Binding Domain (LBD) of PR and their genetic complexity and disease-causing potential are yet to be fully explored.

### Objective

To provide a possible mechanistic explanation to the disease-causing mutations of progesterone receptor.

### Methodology

To investigate the mechanistic effects of a missense mutation, we conducted a thorough search for functional somatic mutations within the protein coding regions of human PR gene (PGR) from various databases, including dbSNP, HGMD, Clinvar, OMIM, PharmaGKB, Ensemble, gnomAD, and LOVD. To identify potentially deleterious variants, we utilized several prediction tools such as Polyphen2, Mut Pred, SNPs& GO, PON-P2, SIFT, and Predict SNP1. Additionally, we

employed a multitude of tools, including Dynamut, CSM, SDM, DUET, CUPSAT, MuPro, Mastero web, PopMuSic, and FoldX, to analyze the structural stability of the selected mutants. To assess the impact of the missense mutation on progesterone (P4) binding to its receptor, we conducted ensemble docking. To further understand the atomic-level interactions of the selected mutants, we employed molecular dynamic simulations. Additionally, we utilized MMGBSA calculations to evaluate the effects of these mutations on the binding of different co-activators.

## **Result**

Following a screening of 285,217 variants, we selected 66 missense variants present in the LBD region for further investigation. The use of various in-silico tools revealed that 12 of these missense mutations were highly pathogenic and structurally unstable. Our analysis of the binding energies of Progesterone to these 12 variants indicated that eight variants exhibited stronger binding energies than the wild type. Molecular dynamic simulations conducted for 100 ns on these variants revealed that RMSD remained stable. Our examination of the binding energies of co-activators with these mutant proteins showed that in the above eight variants, co-activators strongly bound to the proteins, which may result in the development of myoma conditions. Conversely, in the other four variants, the binding energies of co-activators were very low, which may lead to progesterone intolerance conditions.

## **Conclusion**

Our studies provide a mechanistic explanation for the potential development of myoma and progesterone intolerance conditions related to the progesterone receptor.

## ASSOCIATION OF THE *MCP-1* PROMOTER POLYMORPHISM rs1024611 WITH POLYCYSTIC OVARY SYNDROME

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### Background

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders that significantly impact the life quality of reproductively aged women. Globally, PCOS is as high as 15%–20% according to the European Society for Human Reproduction and Embryology/American Society for Reproductive Medicine. In India, the prevalence of PCOS ranges from 3.7 to 22.7 %. PCOS remains as one of the poorly understood disease conditions among physicians and scientists. Major symptoms of PCOS include hyper androgens, ovulatory dysfunction, and polycystic ovaries. PCOS is associated with an increased risk of developing complications such as cardiovascular disease (CVD), obesity, insulin resistance, hypertension, infertility and endometrial hyperplasia. In addition, it also causes anxiety and depression which leads to impaired quality of life. The pathogenesis of PCOS is very complex and multifactorial, having genetic, epigenetic and environmental components. Chronic inflammation plays a pivotal role in PCOS pathogenesis. The Monocyte Chemoattractant Protein-1 (*MCP-1*) is one of the important chemotactic factors for monocytes in an inflammatory response. Genetic variations in *MCP-1* may modulate MCP-1 expression. Although the association of the *MCP-1* promoter polymorphism (-2518A/G) was extensively studied in different inflammatory conditions, there is only one report in PCOS conditions. However, there is no study which explored the involvement of *MCP-1* rs1024611 with Indian PCOS patients.

## **Aim**

To investigate the association of the *MCP-1* -2518A/G polymorphism (rs1024611) with PCOS.

## **Materials and Methods**

In this case-control study, 1002 women (aged between 15 and 35 years) participated. Among them, 498 were PCOS and the remaining 504 were controls. We selected PCOS cases based on the Rotterdam Criteria and we excluded patients with Congenital Adrenal Hyperplasia (CAH), an androgen-secreting ovarian/adrenal tumour, those taking a corticosteroid, antiepileptic, or antipsychotic drugs and a history of hormonal contraception within the previous 6 months. To analyse the distribution and association of rs1024611 with PCOS, PCR-RFLP analysis was carried out in 202 patients who exhibited PCOS from menarche onwards or with high severity of symptoms and 122 age-matched controls.

## **Results**

In our study, PCOS patients had much greater rates of reproductive difficulties such as infertility and abortions than controls. One of the most prominent physiological attributions of PCOS is obesity. In our study, obesity was found in 51% of PCOS patients, but only in 16% of the control group. We observed a statistically significant higher distribution of the GG genotype in PCOS patients compared to control samples, thereby indicating a higher risk of GG genotype with PCOS susceptibility (OR=2.19; 95% CI: 1.008- 4.814, p=0.04).

## **Conclusion**

Our finding suggests that the *MCP-1* -2518 A/G polymorphism is associated with PCOS and could be developed as a potential predictive genetic marker for PCOS predisposition.



# INTEGRATION OF SYMMETRY-RELATED MOLECULES (SRMs) IN CRYSTAL PACKING FOR ACCURATE POSE PREDICTION IN MOLECULAR DOCKING

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## Background

Many drug development campaigns rely heavily on a variety of computational approaches such as high throughput virtual screening, molecular docking, etc, which often aim to accurately predict the interaction of the ligand with the receptor. Both protein/ligand conformations and the sampling algorithm of choice affect the degree of success in finding relevant binding poses of ligands at the target protein's binding site. Some of the problems researchers face includes 1) challenges in selecting a suitable receptor structure for molecular docking, 2) selecting and tuning sampling and scoring algorithms, 3) an inadequate way of considering solvation effects, etc. Several strategies have been proposed to improve the odds of success. In addition to the reported factors influencing ligand binding and pose prediction, we hypothesized that symmetry related molecules (SRMs) in the crystal packing may also influence pose prediction. To validate our hypothesis, we employed molecular docking, free energy calculations, and molecular dynamics simulations to analyze our in-house dataset.

## Aim

To investigate the role of symmetry-related molecules (SRMs) in pose prediction of co-crystallized ligands.

## Methodology

We systematically examined an in-house dataset consisting of 300 structures previously derived from protein databank. We narrowed down our selection to 11 structures in which the bound ligands had a large SASA ( $\geq 15\%$ ) and formed

interactions with SRMs. We performed molecular docking as well as dynamics simulations for the crystal ligands in the presence and absence of SRMs and deduced RMSD and free energy of binding.

## Results and Conclusions

Crystal structures with ligands that protruded towards the solvent and had direct interactions with SRMs were selected and the effect of SRMs on pose prediction was assessed using docking, energy calculations, and MD simulations. Predicted poses using systems with SRMs had substantially lower RMSD in reference to the crystal pose and better free binding energy values. Although poses predicted without SRMs exhibited higher RMSD in reference to the crystal structure ( $\geq 4.43$  Å) than poses predicted with SRMs ( $\leq 0.92$  Å), they still remained stable during the simulation period as the conformation predicted was also energetically favourable. This highlights the challenge of selecting the relevant pose when multiple favourable options exist and emphasizes the importance of considering SRMs when applicable. To summarize, this work highlights the importance of considering the effect of SRMs in molecular docking studies when predicting binding poses of ligands. Further, demonstrated the presence of SRMs significantly influences the accuracy of binding pose predictions and should be taken into account if ligand can form interactions with SRMs. Overall, the study provides important insights into the challenges of accurate binding pose prediction and underscores the need for continued research in this area.

## EXPLORING THE THERAPEUTIC POTENTIAL OF TERPENOIDS FROM *ELETTARIA CARDAMOMUM* FOR THE TREATMENT OF AD BY TARGETING CANNABINOID RECEPTORS

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### Background

Spices, one of the most popular plant-based food additives, contains several secondary metabolites that act as antioxidants and have potential role against the neurological disorders like Alzheimer's disease (AD). The *Elettaria cardamomum* (EC) species is a rich source of terpenoids and has been known for its beneficial properties against AD; however, the biological targets of most of these compounds are still unknown. Through chemical similarity guided target prediction, we have identified cannabinoid receptors (CB) as potential targets for most these terpenoids. Cannabinoid receptors have emerged as potential therapeutic targets for AD in recent years, and its activation by natural or synthetic agonists can reduce the harmful effects caused by amyloid  $\beta$ , tau phosphorylation, neuro inflammation as well as it can also promote the brain's intrinsic repair mechanisms. CB1 and CB2 receptor agonists shows promising actions in neurodegenerative diseases including AD. This study explores the therapeutic potential of new promissory molecules through virtual screening and molecular dynamics simulations of the first set of ligands to analyse the interaction, affinity, and stability of the molecules.

### Aim

Identification of cannabinoid receptor targeting terpenoids from *Elettaria cardamomum* for the treatment of AD through in silico approaches.

### Methodology

Target prediction of secondary metabolites was performed

using Swiss target prediction and Superped web server. In order to study their mode of binding to the target receptors and gain insights into their mechanism of action, molecular docking was conducted for these metabolites within the active sites of the CB receptors. Binding free energy corresponding to each docked pose was calculated using the Prime MM-GBSA method. In order to examine the stability and dynamics of the CB receptor complexes with ligands, MD simulations were also performed in an explicitly-hydrated lipid-bilayer environment.

### **Results and Conclusion**

According to the in-silico target prediction web servers, CB receptors are selected as target for terpenoids from cardamom. Based on binding energy analysis, the majority of ligands have affinity for both CB1 and CB2 receptors. So, we grouped the ligands in to three categories, 1) ligands having high affinity for CB1 receptor, 2) ligands having high affinity for CB2 receptors, 3) ligands having affinity for both CB1 and CB2 receptors.

The result shows that delta cadinene and beta caryophyllene showed similar binding patterns and stability in both CB receptors, indicating a stable binding at the binding pocket throughout the simulation period. Since Beta caryophyllene is already reported as a natural agonist of CB2 receptor, it shows stable in both CB1 and CB2 conformations. The obtained results could have a great contribution to the development, design, and discovery of potent and selective CB ligands. However, further in vitro, in vivo, and mechanistically investigations are warranted.

## MOLECULAR ANALYSIS OF *WNT4* GENE IN INDIAN 46,XX DSD PATIENTS WITH MULLERIAN AGENESIS AND/OR GONADAL DYSGENESIS

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### Background

The term “Disorders of Sexual Developments” (DSDs) was used to refer to a collection of sporadic congenital disorders characterized by aberrant development of the internal and external genitalia. DSDs are broadly classified into three categories based on their chromosomal components: 46,XX DSD, 46,XY DSD, and Sex Chromosomal DSD. Developmental disruption of the Mullerian duct and gonads in females leads to Mullerian agenesis and gonadal dysgenesis, respectively. These two structural abnormalities comes under the 46,XX DSD and in the majority of cases the aetiology remains elusive. In the absence of *SRY* gene, *WNT4* (Wingless type MMTV integration site family member 4) plays a key role in female reproductive structure development. Genetic analysis of the *WNT4* gene identified its involvement in diseases such as sex reversal, premature ovarian failure, mullerian aplasia, or Mayer-Rokitansky-Küster-Hauser syndrome (MRKH syndrome), endometriosis, obesity, and various cancers. However, there are no studies that explored the involvement of the *WNT4* gene in Indian 46,XX DSD patients.

### Aim

To analyse the role of *WNT4* in Indian 46,XX DSD patients with Mullerian agenesis and/or Gonadal dysgenesis.

### Materials & Methods

In the study, we recruited seventy-six adolescent girls with primary amenorrhea. They were identified with diverse Mullerian anomalies, with or without gonad dysfunction, by

clinical and ultrasound examinations. Based on the cytogenetic and *SRY* gene analysis, twenty five 46,XX DSD patients with mullerian agenesis and/or gonadal dysgenesis cases were included for *WNT4* gene mutation analysis. PCR sequencing was performed for all the coding exons of *WNT4* gene. Bioinformatic tools were used to predict the effect of nucleotide substitution in the *WNT4* gene. Mutation Taster software was used to identify the effects of identified *WNT4* variations in the patients. To identify the effect of intronic variation in mRNA splicing, we analysed our identified intronic variations by using Human splicing Finder- Version 3.1. Apart from this, miRNA target prediction and functional annotations based on them were done using the online database miRDB.

## Results

We observed single nucleotide variations in three patients. One patient showed a known synonymous polymorphism (rs544988174, (c.861C > T; p.G287G). The identified polymorphism in the present study has not been reported so far in 46,XX DSD cases. Other two cases carried a nucleotide substitution in intronic regions (c.446-30G >A& c.313 + 14G >A). *WNT4* intronic variations are very rarely reported in disease conditions. However, we could not find any influence of these variations in the splicing machinery of the *WNT4* gene.

## Conclusion

We could not find any indication of the involvement of *WNT4* gene in the Indian 46,XX DSD patients with Mullerian agenesis and/or Gonadal dysgenesis. In the future, molecular characterization in more patients is needed to increase the evidence to link *WNT4* variants with these structural abnormalities.

## GENETIC SUSCEPTIBILITY OF *IRF6* GENE IN NON-SYNDROMIC CLEFT LIP AND PALATE IN KERALA POPULATION

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### Background

Orofacial cleft primarily cleft lip and cleft palate constitute one of the most commonly occurring congenital abnormalities and represent a global health care challenge (World Health Organisation, Human Genetics Programme 2002). Cleft lip with or without cleft palate is the most common craniofacial birth defect 1/700 live births. The *IRF6* gene plays an important role in the development of the lip and palate by directing epithelial motility, epithelial- mesenchymal transition, apoptosis, and epithelial adhesion. There are 36 SNPs in *IRF6* that have been linked to orofacial clefts and have been found in Asian, European, and American populations. Additional research in diverse populations revealed that SNPs in the *IRF6* gene are linked to NSCLP. *IRF6* is thought to have a significant role in NSCLP based on previous research.

### Aim

To assess the associations of *IRF6* SNPs with Non syndromic orofacial clefts.

### Methodology

The study population consisted of 60 patients and same number of non-cases. Non syndromic orofacial clefts were recruited from the Charles pinto Centre for Cleft Lip, Palate and Craniofacial Anomalies, Jubilee Mission Medical College Thrissur. Patients and non-cases each had four mL of peripheral blood drawn in an EDTA Vacutainer followed by extraction of genomic DNA. After Polymerase Chain Reaction, the PCR

products were sequenced for analysis of the *IRF6* gene variants.

## Result

According to this study there is a significant difference in genotype and allele frequencies of *IRF6* gene polymorphism rs2235371 were observed between cases and Non cases. The frequency of A allele of rs2235371 have a statistically significant association with NSCLP (OR (95%CI) = 4.78 (1.56-14.68), P=0.0029. A subgroup analysis by NSCLP types indicated that the variant A allele significantly associated with NSCL. Genetic models showed negative association [dominant model - OR (95%CI) = 0.23(0.072- 0.762), recessive model - OR (95%CI) = 7.36(0.037- 145.75), and over dominant - OR (95%CI) = 0.32(0.09- 1.06),] in our study.

## Conclusion

In summary, there is a significant difference in genotype and allele frequencies of *IRF6* polymorphism rs2235371 G>A in NSCLP cases and non-cases in our study. Additionally, we observed that A allele have a significant association with NSCL subtype. However, our results conclude that rs2235371 in *IRF6* gene are associated with decreased risk of NSCLP. Further comprehensive, and detailed studies with larger sample sizes are warranted to determine the clinical relevance of the association of *IRF6* SNPs with NSCLP.



## ANTIOXIDANT AND ANTI-HEMOLYTIC ACTIVITY OF FLAVONOIDS FROM *CARICA PAPAYA* L. CULTIVAR 'RED LADY' LEAF

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### Background

*Carica papaya* L. is one of the most popular fruit crop, belongs to the family Caricaceae. It is cultivated in the tropical and subtropical regions of the world. Leaves are traditionally used for the treatment of various diseases. It is rich in antioxidants such as flavonoids, having health oriented biological benefits such as anti-inflammatory, immunomodulatory, antiviral, antioxidant and anti-carcinogenic properties.

### Aim

Aim of the present study is isolation and characterization of flavonoids from *Carica papaya* L. cultivar 'Red Lady' leaf and evaluation of its antioxidant and antihemolytic activity.

### Methodology

In the present study young leaves of *Carica papaya* L. cultivar Red lady were collected from the premises of JMMC & RI. The plant specimen was systematically authenticated, and the voucher specimen was deposited at Calicut University herbarium CALI (No. 123770), Kerala. Young leaves were shade dried and powdered using a rotary grinder. The powdered plant material was extracted in methanol, concentrated and dissolved in water and further fractionated in chloroform and butanol. The flavonoids in the isolated butanolic fraction was detected using UPLC-ESI-Q-ToF-MS/MS analysis. Antioxidant activity was evaluated by DPPH free radical scavenging assay and FRAP assay. Antihemolytic activity of flavonoid fraction was evaluated by the erythrocyte membrane protection efficacy against H<sub>2</sub>O<sub>2</sub> induced hemolysis, OFT

(Osmotic fragility test) and SEM analysis.

## Results and discussion

UPLC-Q-ToF-MS/MS analysis detected 11 flavonoids in the isolated butanolic fraction viz, quercetin, quercetin dimer, kaempferol, luteolin, 2-(3,4-Dihydroxy-5-methoxyphenyl)-3,5,7-trihydroxy-6-methoxy-2,3 dihydro-4H-chromen-4-one, rutin, isoquercetin, manghaslin, nictoflorin, astragalín and mauritianin. Among the detected flavonoids, luteolin, astragalín, 2-(3,4-Dihydroxy-5-methoxyphenyl)-3,5,7-trihydroxy-6-methoxy-2,3 dihydro-4H-chromen-4-one and quercetin dimer are new reports in papaya leaves. DPPH assay and FRAP assay showed that FBC have significant antioxidant activity, it scavenged the free radical and reduced the metal ions in a dose dependent manner. FBC significantly inhibited H<sub>2</sub>O<sub>2</sub> induced hemolysis and lipid peroxidation in a concentration dependent manner (0.2mg/ml, 0.4mg/ml and 0.8 mg/ml). FBC at concentrations 0.2 mg/mL, 0.4 mg/mL and 0.8 mg/mL inhibited the hemolysis to 76%, 85% and 87 % respectively. Lipid peroxidation caused by H<sub>2</sub>O<sub>2</sub> was reduced to 35 %, 45% and 65% of FBC treatment in dose dependent manner. Osmotic fragility test of erythrocytes in hypotonic solutions showed that as compared to negative and positive controls, FBC pretreated (0.4 mg/mL) erythrocytes shifted the OFT curve towards left indicates the protection of erythrocytes from osmotic fragility. The membrane protection role of FBC in erythrocytes were further confirmed by scanning electron microscopy (SEM), which was marked by the reduction in erythrocyte membrane blebbings and echinocyte formation.

## Conclusion

Our study observed that the flavonoid rich fraction isolated from *C. papaya* cultivar 'Red Lady' leaf could be used as naturally derived antihemolytics.

## **EXPLORING THE PATHOPHYSIOLOGY OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE EXACERBATIONS VIA ERYTHROCYTE PROTEOMICS: A COMBINED MASS SPECTROMETRY/BIOINFORMATICS**

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### **Background**

Chronic Obstructive Pulmonary Disease (COPD), is a progressive lung disorder projected to be the third leading cause of global mortality by 2030 and is an increasingly important cause of disability and morbidity worldwide. COPD is a condition which can be aggravated during COVID. Previous reports implicate an altered erythrocyte morphology and physiology in COPD, prompting us to undertake this study.

### **Aim and Objectives**

The present study aimed at exploring the pathophysiology of COPD exacerbation by combining erythrocyte proteomics with bioinformatics. The major objectives of the study were

- The identification of differentially expressed proteins (DEPs) in exacerbated COPD with respect to healthy controls via mass spectrometric analysis.
- Analysis of the DEPs for their functional annotation and pathway enrichment using bioinformatics tools to elucidate the role of these proteins in the pathophysiology of COPD exacerbations.

### **Methodology**

The study was a comparative cross-sectional study. The samples were obtained from a tertiary care hospital after obtaining approval from Institutional ethics committee. The

COPD samples were collected in accordance with Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines. Hemodepletion followed by protein concentration was performed on both the COPD and healthy control samples. The samples were then protein quantitated and normalized for high-throughput mass spectrometry analysis. LC-MS/MS analysis identified several differentially expressed erythrocyte proteins associated with COPD. The differentially expressed proteins were then subjected to bioinformatic analysis such as functional annotation and MCODE to identify the highly enriched protein clusters in COPD exacerbations.

## **Results**

Differential expression of many proteins involved in inflammatory signalling pathways was identified. Bioinformatics analysis revealed that the major hub proteins were enriched in molecular events such as MAPK signalling, hypoxia, apoptosis, neutrophil migration and ciliogenesis. The DEPs were also enriched in neutrophil granulation, antimicrobial resistance and FGF signalling pathways, which were commonly, enriched in COVID proteomic studies as well. We also observed proteins such as kyphoscoliosis peptidase, sperm associated antigen-1, calpastatin and LINE to be differentially expressed during COPD exacerbations.

## **Conclusion**

In conclusion, this study made an attempt to combine mass spectrometry and bioinformatics to explain the pathophysiology of exacerbated COPD. Validation studies of some of the first-time reported proteins in our study could help in better understanding their biomarker potential leading to improved therapeutic management of COPD. The identification of downstream signaling pathways in which the DEPs were enriched helps to increase our understanding of COPD pathophysiology, which can lead to more efficient risk management and targeted therapeutics, as well as delineating COPD exacerbations from stable COPD.

## VARIATIONS IN THE KARYOTYPE ANALYSIS OF PATIENTS WITH NON SYNDROMIC CLEFT LIP AND PALATE

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### Background

Non-syndromic cleft lip and palate (NSCLP) is a common birth defect affecting 1 in every 700 newborns and it is nearly 1 in 500 in India and approximately 1,35,000 worldwide each year (Radhakrishna et al., 2006). The occurrence frequency of cleft lip with or without palate varies among different geographic areas. The etiology of this anomaly is proposed to be complex and multi-factorial including genetic and environmental factors. The etiologies for congenital malformations include single gene defects (20%), chromosomal aberrations (10%), teratogens (10%), environmental factors (30%) and other unknown causes (30%). Cleft lip and palate are one of the most common congenital malformations. The research in cleft lip and palate had gone through several genetic approaches like chromosomal rearrangement studies, gene expression analysis, linkage analysis. Many candidate genes are suggested to have a role in NSCLP, however it is still a challenge to determine the etiology. It has been estimated that 6% of all congenital malformations are due to visible cytogenetic abnormalities. Of which approximately 5% of congenital defects with cleft lip and palate have been reported an association with structural and numerical chromosomal abnormalities (Cobourne, 2004). The origin of syndromic clefting can be chromosomal, Mendelian or sporadic. Chromosomal anomalies are important hints for genes that involve in clefting of the lip and palate.

## **Aim & Objective**

The aim of this study was to assess structural variations in the karyotypes of Non-Syndromic Cleft lip and palate patients

## **Methodology**

The study was performed in Jubilee Mission Medical College and Research Institute, Thrissur. Non syndromic Cleft lip and palate patients were recruited from the department of Plastic Surgery, JMMC&RI. A total of 130 patients with non-syndromic cleft lip or palate were selected for the study. Peripheral blood from the participants were drawn in sodium heparin vacutainers. Cell culture was performed according to the standard protocol followed in the Genetics and Genomics Laboratory of JCMR.

## **Results**

Cytogenetic analysis by GTG banding in 130 Non-syndromic cleft lip and palate patients (NSCLP) revealed 5 cases with abnormal karyotype where a higher frequency of pericentric inversion in chromosome 9 (inv(9)(p11p13)) was found.

## **Conclusion**

Cytogenetic studies are helpful to find out the involvement of chromosome abnormality in orofacial clefts. This provides some conclusive information for patient management and offering genetic counseling to the patients at risk.

## **WORK-LIFE BALANCE AMONG TEACHERS**

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### **Background**

The idea of balancing work and personal life has become an important study for researchers. The present study was aimed to assess the work-life balance among teachers.

### **Objectives**

- To assess the work-life balance among teachers
- To find the association between work-life balance and selected socio-personal variables of teachers.

### **Methodology**

A quantitative approach with descriptive cross sectional design was used in the study. A total of 188 upper primary and high school division teachers were selected by cluster sampling technique. The settings were selected schools in Thrissur district, which included five schools from Govt. sector, three schools from aided sector and three schools from private sector. The tools used were a socio-personal data sheet and a structured questionnaire on the work-life balance with four components namely workplace support, work interference with personal life, personal life interference with work and satisfaction with work-life balance. The data were analysed by using Descriptive and Inferential statistics.

### **Result**

The major findings of socio demographic variables shows that half of school teachers belonged to 41-50 years of age. The distribution of teachers was almost equal in government (33.5%), aided (34.6%) and private (31.9%) schools. Among the total study population, 75% of school teachers belonged to a nuclear family. Among teachers 63.8% had 4-5 members and 55.3% of school teachers had two children, 1.6% had four children in their family. Among

teachers, 38.23% had sick members in their family who were in the age group of 81-90 years and 51.1% of school teachers had total teaching experience of 11-20 years.

The work-life balance of teachers is categorized as high, moderate and low. The findings revealed that 37.2%, 61.2% and 1.6% of school teachers had high, moderate and low work-life balance respectively. Majority (81.4%) of school teachers reported high support from work place. Half (50%) of school teachers reported that their work moderately interferes with personal life and 65.4% reported low interference of personal life with their work. Among school teachers, 66.5% had high satisfaction with work-life balance. The work-life balance of teachers were significantly associated with the number of children in the family ( $p < 0.05$ ), type of school ( $p < 0.01$ ) and total teaching experience of teachers ( $p < 0.05$ ).

### **Conclusion**

Teachers have an indispensable role in laying the foundation for a society's bright future. Lack of balance in family and work-life among teachers will affect the society. In the present scenario teachers face a lot of backlash for guiding students in a conventional way. As a result, teachers have to take in a lot of work- related stress to manage their students. This study identify the work- life balance among teachers. The result showed that 37.2%, 61.2% and 1.6% of school teachers had high, moderate and low work-life balance respectively. There was a statistically significant association between work-life balance and selected socio personal variables of teachers such as the number of children in the family, type of school and total teaching experience.



## **SOCIO ECONOMIC FACTORS INFLUENCING ACCESSIBILITY TO HEALTH CARE AMONG ADULTS**

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### **Background**

The golden triangle of ideal healthcare consists of availability, affordability and acceptability. Social and economic factors such as income, education, employment, and social supports can significantly affect the accessibility. Low socio economic status is an important determinant of access to health care. This study was conducted to assess the socio economic factors influencing accessibility to health care among adults in Thrissur district.

### **Aim**

The study aimed to identify the socio economic factors influencing accessibility to health care in terms of availability, affordability and acceptability among adults.

### **Methodology**

Descriptive survey design was used with the sample size of 200 selected from the population of adults residing in selected rural and urban areas of Thrissur. One adult per family was selected using multi stage random sampling with equal number of adults from each ward of Avanur, Thekkumkara, Valappad panchayaths and urban corporation sectors. Structured questionnaire was used to assess socio economic factors and accessibility to health care. The total score (for accessibility) range between 39 and 107. The total score was arbitrarily categorized into three which are Good (85-107), Average (62-84), Poor (39-61).

### **Results**

The major findings of the socio economic variables show that 32.5% of adults belonged to 61-70 years of age. The mean age was 49.43  $s\pm 13.9$  year. More than half (65.5%) of adults

were females and more than half (60%) of adults belonged to APL category. More than half (63.5%) of the adults were having monthly personal income less than 25,000 Rupees. Statistical analysis proved that socio economic factors such as age, education, occupational status, income based on ration card colour, housing amenities and availability of car and number of sick persons in family had significantly strong influence on accessibility to health care.

Regarding overall accessibility, 28% of the adults had good accessibility towards health care and 72% of them had average accessibility and no one was in the category of poor access to health care. More than half of the adults and their families were having good availability and affordability of health services. Nearly half (48.50%) of adults were having poor acceptance towards governmental health care services including preventive and curative health care.

### **Conclusion**

SEF have the key role in improving access to health care. Low socio economic status has a direct impact on health and wellbeing. This research study identifies that SEF influencing accessibility to health care among adults in selected areas of Thrissur. Present study highlights that among the three domains of accessibility, acceptance is the major domain which is lacking in the specified area.

## **GUIDED MENTAL IMAGERY ON STRESS AND CLINICAL INDICATORS AMONG PATIENTS UNDERGOING HEMO DIALYSIS**

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### **Background**

Stress is our companion in all situations of life and especially in illness. Various studies have shown that stress is very high in dialysis patients. Although there are many remedies for a stressful life, Guided Mental Imagery is a mental exercise that calms the mind and focuses it in a specific way.

### **Aim**

The present study was aimed to evaluate the effect of guided mental imagery on stress and clinical indicators among patients undergoing hemodialysis.

### **Objectives**

- To assess the level of stress and clinical indicators before and after guided mental imagery among patients undergoing hemodialysis in intervention and control group
- To evaluate the effect of guided mental imagery on level of stress among patients undergoing hemodialysis after the guided mental imagery in intervention and control group
- To associate the pre- test level of stress with selected Socio demographic and clinical data variable in interventional and control group.

### **Methodology**

True experimental, pre-test, post-test control group design was used with a sample size of 60, selected by random sampling method. Study was conducted in the Nephrology unit of JMMC & RI, Thrissur. Pre- test conducted on 1<sup>st</sup> day by using self -structured hemodialysis stress scale in both group. Intervention guided mental imagery relaxation audio recording provided for 9 days in interventional group. Post test was

conducted 9<sup>th</sup> day in both groups.

### **Result**

In the present study equal sample size (30%) fall in age group 53-63 years and 42-52 years of the both in interventional and control group respectively. Majority of the subjects 23(76.6%) in interventional group and 20(66.6%) control group were males. 20 (66.6%) in the interventional group and 24(80%) in the control group were married. In the interventional group 7 (23.3%) had age of disease occur in the age 31-41 years and in the control group 12(40%) on age of disease occur in 53-63 years. 7 (23.3%) of the interventional group had higher secondary education level and 6 (23.3%) of the control group had primary education level. 6(20%) in the interventional group were un employed and 8 (26.6%) were manual labour in control group. Both group 30 (100%) patients following regularity of treatment. The overall mean post- test stress level score in interventional group ( $86.63 \pm 10.55$ ) was highly significant than the mean pre- test stress level score ( $103.276 \pm 9.951$ ). There was highly significant difference in post -test stress level of patients in interventional group at ( $p < 0.000$ ). The calculated un paired t' test value in overall post -test stress level of interventional and control group was ( $t_{58} = 1.6715$ ,  $p < 0.000$ ).

### **Conclusion**

Guided mental imagery was effective in stress Reduction in Hemodialysis Patients.

## PROTEOMIC PROFILING OF NEUROMYELITIS OPTICA SPECTRUM DISEASES AND THEIR FUNCTIONAL ANALYSIS

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### Background

Neuromyelitis optica spectrum diseases (NMOSD) are a type of autoimmune, demyelinating disease affecting the central nervous system (CNS). It causes inflammatory lesions in the optic nerves, spinal cord and other vital areas of CNS. NMOSD are clinically featured by optic neuritis (ON) and longitudinal extensive transverse myelitis (LETM) and are closer to clinical manifestations of multiple sclerosis (MS). NMOSD are clinically distinguished from MS based on seropositivity to immunoglobulin G (IgG) of Aquaporin-4 (Aqp-4) or Myelin oligodendrocyte glycoprotein (MOG). In a few cases of NMOSD, IgG seronegativity was observed for both IgG of Aqp-4 and MOG and absence of oligoclonal bands, indicative of MS. Therefore, the study focused on identifying the distinctive proteins in NMOSD variants and their functional analysis for facilitating the diagnostic accuracy.

### Methodology

The study was conducted after getting approval from Institutional ethics committee. The study groups were selected in the age between 20 and 60 years. The pooled serum samples were selective for females and excluding males to improve the homogeneity and consistency of samples.

The groups for the proposed study were classified as, Group A: Normal healthy control; Group B: MOG IgG positive neuromyelitisoptica; Group C: IgG negative for AQP-4 and MOG IgG with optic neuritis and myelitis; Group D: AQP-4 IgG positive neuromyelitisoptica. Detection of IgG in serum was done by indirect immunofluorescence assay using commercially

available kit (Euroimmune). Blood was collected in clot activator vacutainers from the participants and serum collected after centrifugation. The serum was pooled from the individuals from respective groups and subjected to albumin/globulin removal using predesigned column (GE health care). The flow through fraction was concentrated and salt depleted using 5 kDa cutoff spin filters (Millipore). The protein concentration in the sample was done by Bicinchoninic acid (BCA) assay method and normalised.

Proteomics experiment was done using mass spectrometry. Briefly, the processed serum samples after tryptic digestion were subjected to liquid Chromatography tandem Mass Spectrometry (LC-MS/MS) for proteomic analysis. The samples were analyzed in triplicate and data was acquired using Masslynx software. The generated peptide masses were searched against Human UniProt protein sequence database using the Progenesis QI for proteomics (QIP) V3.0 for protein identification and quantification. Functional analysis of the differentially expressed proteins (DEPs) in each group was done using Blast2GO 5.2, which is a bioinformatics software tool for advanced functional annotation of novel sequence data.

## Results

The differentially upregulated proteins in all NMOSD variants with respect to control were smaug homolog protein and serum amyloid A involved in cholesterol transport and inflammation respectively. Truncated breast and ovarian cancer susceptibility protein and cystic fibrosis transmembrane conductance regulator protein were specifically upregulated in NMOSD with IgG negative to AQP-4 and MOG IgG. Besides, the uniquely downregulated proteins such as antithrombin III and histidine rich glycoprotein in NMOSD can be accounted for its dysregulated fibrinolysis. It was also observed that in both Aqp-4 and MOG-IgG positive NMOSD, calcium binding protein 2 (CaBP2) and plasma protease C1 inhibitor were found to be upregulated involved in regulation of calcium signaling and complement pathway respectively. In addition, some of the

complement components involved in membrane attack complex (MAC) were upregulated in all NMOSD variants. In general, the differentially expressed proteins in NMOSD were involved in cholesterol transport, synaptic vesicle mediated transport, myelination and neurotransmitter receptor trafficking.

### **Conclusion**

The study throws light on improving the therapeutic strategy for NMOSD in the light of differentially expressed proteins that play key role in myelination, neuronal cholesterol transport, visual perception and complement mediated immune response. The study has a future potential in developing these proteins as reliable specific biomarkers aiding clinicians for diagnostic accuracy for NMOSD.

## **CYTOGENETIC AND MOLECULAR CHARACTERIZATION OF ABNORMAL CHROMOSOMES IN TURNER SYNDROME PATIENTS**

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### **Background**

Turner syndrome (TS) is one of the most common genetic conditions, affecting 1 in 2,500 female live births. TS is associated with variety of morbidities such as primary amenorrhea, cardiovascular diseases, diabetes mellitus, hypertension, hypothyroidism and osteoporosis. The genetic background of the Turner Syndrome phenotype is highly variable, which includes complete or partial absence of the sex chromosomes (the X and/or Y chromosomes) known as the classical type (45,X). The classical karyotype only accounts for 50% of cases. The remaining cases are mosaic (i.e. 45,X/46,XX or 45,X/47,XXX), isochromosome of X (e.g. i(Xq) or i(Xp)) and marker chromosomes. Since there is greater phenotypic variability observed in TS individuals, the molecular analysis of the abnormal chromosomes is essential for better phenotypic and genotypic correlation.

### **Aim**

To characterize abnormal chromosomes in Turner syndrome patients

### **Materials and methods**

Peripheral Blood samples were collected from the patients after getting informed written consent. Classical cytogenetic analysis was performed in twenty one Turner syndrome suspected samples. GTG-banding was done according to standard procedures, and a minimum of 50 metaphase cells were scored for each patient. Karyotypes were described according to International System for Human Cytogenetic



Nomenclature (ISCN 2020). Fluorescence *in situ* hybridization (FISH) was performed using Kreatech centromeric probes for chromosomes X and Y. A minimum of 200 Interphases and 20 metaphases were scored. Multicolour colour banding for X chromosome was done according to standard procedure. Genomic DNA was isolated from the peripheral blood of the patients by using KIT methods. The presence of important Y chromosome sequences such as *SRY* (sex- determining region Y) and *TSPY* (Testis specific protein Y) were investigated by PCR.

## Results

G-banded chromosome analysis of 72 hours culture peripheral blood cells showed a classical turner syndrome pattern (45,X) in six cases (28%). In remaining cases a loss X chromosomes in mosaic form was observed. Among these three patients showed Y chromosome materials. Apart from these, two patients showed a mosaic pattern with super numerary marker chromosomes (Mos45,X[38]/46,X,+mar[22];45,X[30]/46,X,+mar[20]). Metaphase FISH analysis of patients with super numerary marker chromosomes revealed their origin from X and Y chromosomes. In one case with marker chromosome, we observed an absence and presence of *SRY* and *TSPY* genes sequences respectively. Since the presence of *TSPY* gene in our patient might increase the risk of developing gonadal tumors we recommended gonadectomy.

## Conclusion

We identified a wide range of chromosomal abnormalities in TS patients. Notably, we observed supernumerary marker chromosomes in two TS patients which were originated from sex chromosomes. Since the marker chromosomes carry numerous genes, the molecular analysis of the marker chromosomes can provide useful information for genetic counselling and treatment of the Turner syndrome patients.

## EVALUATION OF VANCOMYCIN MINIMUM INHIBITORY CONCENTRATION (MIC) TREND IN MRSA INFECTIONS IN A TERTIARY CARE HOSPITAL

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### Background

Methicillin resistant *Staphylococcus aureus* (MRSA) is an important cause of healthcare associated infection and vancomycin is the cornerstone in the treatment of patients with serious MRSA infections. A reduction in the efficacy of vancomycin against MRSA strains with a high vancomycin MIC (1–2 µg/mL) has been described in an observational study by Soriano *et al* (2008, Clinical Infectious Diseases), suggesting that subtle changes in the MIC may lead to treatment failures. This phenomenon of gradual increase in the value of glycopeptide Vancomycin MIC for *S. aureus* is known as MIC creep. Although the vancomycin MIC creep is a global scenario, regional evaluation of susceptibility profiles is important for the successful clinical management of MRSA infections locally. Vancomycin usage in the institution was also analyzed.

### Objectives

- To evaluate trend of vancomycin MIC in MRSA infections to look for MIC creep
- To analyze any relation between vancomycin consumption and MIC trend

### Methodology

This was a retrospective descriptive study conducted for a period of 6 years (Jan 2016 to Dec 2021) in the Department of Microbiology JMMC & RI, Thrissur. The specimen received for culture were processed as per routine. The antibiotic susceptibility profile of all clinically relevant non-repeating *Staphylococcus aureus* isolates was retrieved from the Automated Vitek-2 Compact system. MICs of Oxacillin (for

methicillin resistance) and Vancomycin were analyzed. According to WHO Collaborating Centre for Drug Statistics Methodology, the usage of vancomycin is described by the defined daily doses per 1000 bed-days (DDDs/1000 bed-days) and this data was obtained from pharmacy services.

The data was analyzed using IBM SPSS system for statistical analysis. Association between DDDs/1000 bed days for vancomycin and the MRSA susceptibility was assessed using linear regression.

## Results

After analysing Oxacillin MIC, 1077 isolates (44.7%) among the 2410 clinically relevant *Staphylococcus aureus* (44.7%) isolates were found to be MRSA. All isolates were susceptible to vancomycin using current CLSI guidelines. Over the study period, the number of MRSA isolates with MIC  $\leq 0.5$  ranged from 62.4% to 23.8%, MIC = 1 ranged from 35.6% to 72.% and MIC = 2 ranged from 2.1% to 4%. DDD of vancomycin ranged from 1.4 to 1.7 DDDs/1000 bed days.

## Conclusion

Even though the MIC has increased over the years, progressive creep could not be established. However, the number of MRSA isolates with vancomycin MIC = 1 and MIC = 2 even if they are in the susceptible range has increased and the isolates with MIC  $\leq 0.5$  have decreased over the study period. The usage of vancomycin has also increased over this time period and this maybe a noticeable trend. But, there was no statistical correlation found between increased usage of vancomycin and increased percentage of isolates with high MIC. Since we have obtained the consumption data only from our pharmacy and not included purchase from outside hospital pharmacy, the data maybe skewed. By looking at other factors and monitoring the MIC trend of vancomycin and its usage may help in providing insight into emergence of resistance.

## **IMPACT OF REGULAR HAND HYGEINE AUDITS IN COVID INTENSIVE CARE UNITS IN A TERTIARY CARE CENTRE IN KERALA**

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### **Background**

There is a rapid increase of healthcare-associated infections (HAI) in COVID care settings, most of which are due to multidrug resistant organisms (MDROs). To reduce the rates of HAIs in COVID care areas, the single most efficient way is adherence to Hand hygiene (HH).

### **Aim & Objectives:**

- To determine hand hygiene (HH) adherence rate of healthcare workers (HCWs) in COVID ICUs.
- To evaluate the impact of conducting regular HH audit and providing onsite corrections to the HCWs along with timely feedback to the stake holders by observing the trends of the month-wise HH adherence in COVID ICUs.
- To find out the profession-specific and WHO's moment-specific adherence rate of HCWs in COVID ICUs.

### **Methodology**

This was a prospective study (HH audit) conducted for 6 months (July 2021-December 2021) in COVID ICU at JMMC & RI, Thrissur. The HCWs such as doctors, nurses, house-keeping staffs and other staffs in COVID ICU were the study participants. The infection control nurses (ICNs) of the Hospital Infection Control and Prevention (HICP) unit were selected to perform the HH audit. The HH audit was conducted according to WHO's HH audit tool by direct observation method and the data was collected electronically through an App (IBHAR HH audit App). From the monthly data, the HH complete adherence rate (HHCAR), HH partial adherence rate (HHPAR) and HH total adherence rate (HHTAR) were calculated. Profession-specific HHTAR and moment-specific HHTAR were also

calculated. The monthly report and the feedback were shared to the clinicians of COVID ICU and also presented in the HICP committee meeting. The collected data has been analyzed and the association between these parameters with a P-value of  $<0.05$  was considered statistically significant.

## Results

There were 1823 completed observation periods (each conducted for 20 minutes) during the entire study period. The HHTAR, HHCAR and the HHPAR for the study period were found to be 66.4% (1211/1823), 47% (864/1823) and 19% (347/1823) respectively. It was observed that monthly HHTAR progressively increased during the study period from 62.2% to 72.1% and was statistically significant. Although the profession specific HHTAR kept fluctuating among doctors, nurses, housekeeping and allied staffs, a statistically significant progressive increase was found only in nurses. In moment specific HH adherence WHO's moments 2 and 3 have been shown to have highest HH compliance (90% and 94.8% respectively). The improvement in monthly HH compliance during the study period for moments 1 and 4 showed a statistically significant increase in trend with a P-value of  $<0.001$ .

## Conclusion

Regular HH audit and timely feedback to the stakeholders have significant positive impact on hand hygiene compliance in health care system. A sustainable behavioral change in spite of increased work pressure is the need of the hour to achieve a higher standard of HH compliance as this simple infection prevention measure plays a significant role in preventing cross-transmission of MDROs in healthcare settings.

# ARTIFICIAL INTELLIGENCE IN IDENTIFICATION AND CLASSIFICATION OF BONES - PATELLA, TALUS AND CALCANEUM BY SUPERVISED MACHINE LEARNING METHOD

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## Background

Artificial intelligence or A.I. is the simulation of human intelligence in machines, that can think and act like humans. Machine learning is a subset of artificial intelligence. Machine learning utilises the data received and creates algorithms based on the patterns in the data. It gives the ability to learn without being explicitly programmed which is different from the conventional software programming. One of its methods is supervised machine learning. In supervised machine learning, we give labelled data to the machine learning model for training. Based on the training of labelled data, the machine learning model can classify the newly given data. Here in this study we are utilizing this method to identify and classify bones - Patella, Talus and Calcaneum.

## Aim

To determine whether the supervised machine learning model can identify and classify patella, talus and calcaneum with an accuracy of more than 90%.

## Methodology

In this study we have used cadaveric dry bones. 25 calcaneum bones, 27 talus bones and 29 patellae were taken for the study. All the bones were photographed. The images were prepared for training the machine learning model. We also changed the background of the bones in the photographs to reduce errors. After the data preparation, we had labelled the images for each classes- Patella, talus and Calcaneum. From each class, we took 6 images for testing the model. So we have 2 separate datasets for each of the classes. One dataset for

training and the other dataset for testing the model. Then we used the training dataset for the training the model.

We have utilised ‘Teachable machine’ tool for training the image datasets. For the training datasets, 40 image samples for the patella, 44 images samples for calcaneum and 47 image samples for talus were taken. The model was trained for each dataset. After the training, the machine learning model was created. We then tested the model with the testing datasets images, that is, those were not used for the training. We had fed the testing datasets and we recorded the predictions for each class.

### **Results**

The supervised machine learning model has successfully identified and classified each testing datasets of patella, talus and calcaneum with accuracies of more than 95%.

### **Conclusion**

The supervised machine learning model accurately identified and classified patella, calcaneum and talus from the images. Hence machine learning models can be utilised in applications involving identification of bones like in surgical field of vision, forensic anthropology, in improving the accuracy of 3D printed bone prostheses.

## **A SYNDROMIC TESTING TO UNRAVEL THE MYSTERIES IN CNS INFECTIONS WITH THE NOVEL FILM ARRAY MULTIPLEX NESTED PCR**

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### **Background**

Central Nervous System (CNS) infection is a serious life threatening scenario which is associated with detrimental sequelae, in more than one-half of its survivors and is also an important cause of mortality. The various reasons for the consequence of such infections in patients can be the crisis in identifying the causative agent with the conventional microbiological procedures, low volume sample, previous antibiotic use or causative organism being fastidious/ non-cultivable bacteria, fungi, virus etc. CNS infections are indeed a challenging clinical scenario where the clinician suspecting a case of bacterial meningitis is often disheartened by a sterile culture report. Here we analyse the use of an integrated multiplex PCR platform, FilmArray (BioFire, by Biomerieux), using Meningo-encephalitis panel (FA/ME) for a timely targeted therapy by the rapid detection of the pathogen.

### **Objectives**

- To identify the microbiological profile in patients with acute meningo-encephalitis.
- To compare the results of the filmarray technology with the conventional tests for the identification of pathogen.

### **Methods**

This is a retrospective descriptive study done in the department of Microbiology of our institute for a period of 18 months from November 2021 to April 2023. The CSF samples from patients with features of acute meningitis/ encephalitis, were subjected to film array testing as per the request of clinicians. They were simultaneously subjected to routine culture and sensitivity using the standard microbiology



techniques to correlate the detection of bacterial pathogens by Filmarray ME panel testing, to look for organisms apart from that listed in the panel and also to rule out any contamination. The biochemical and the cell count analysis of the CSF samples were analysed and a brief history of the patients presentation were also enquired and noted. The results of both methods were compared and analysed.

## Results

A total of 160 CSF samples were tested by Filmarray ME panel among which pathogens were detected in 27 (16.9%) samples. The organisms detected include, *Streptococcus pneumoniae* in 14 (51.9%), *Listeria monocytogenes* in 4(14.8%), Herpes simplex virus and Enterovirus in 2 each (7.4%) and Varicella zoster virus, *Cryptococcus neoformans*, Human Parechovirus and *Hemophilus influenzae* in one each (3.7%). The conventional method by culture revealed positivity in only 3.8% (6 samples- 3 isolates of *S.pneumoniae*, 2 isolates of *Listeria* and 1 *Cryptococcus*).

## Conclusion

The Filmarray ME panel is a valid diagnostic tool that helps in early diagnosis and initiation of appropriate therapy. The advantages of FA/ME panel test is the rapid identification of the pathogen, including fastidious agents and viruses. It can be lifesaving in patients who had prior antibiotic exposure which could have been missed by conventional methods. This rapid, reliable and accurate diagnostic testing tool alongside the routine diagnostic workup will help the clinician to initiate, alter or discontinue an antimicrobial agent, which in turn reflects in fewer neurological consequences, shorter hospital stays and reduce the antimicrobial resistance burden due to unnecessary antibiotic exposure.

## **UTILIZATION OF HBO THERAPY IN INTEGRATION OF DERMAL SUBSTITUTE WITH SKIN GRAFTING AS A SINGLE STAGED PROCEDURE: AN INSTITUTIONAL APPROACH**

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### **Background**

Full thickness skin defects are usually covered by split thickness skin grafting procedure. Split thickness skin grafting without dermal substitute may cause higher level of contracture resulting in limitation in movements and hypertrophic scar formation. Usually a dermal substitute is preferred for split thickness skin graft only reconstruction as it provides more durability to the reconstructed tissue. When dermal substitute are planned, the surgical procedures are divided in stages. Stage 1- wound debridement, Dermal substitute application and Negative pressure wound therapy [NPWT], stage 2- Skin grafting and NPWT. Each stage at an interval of one week. Hyperbaric oxygen therapy application is effective in providing 100% oxygen to the wound bed which enhances the neovascularization and helps in delivering oxygen to the wound bed by diffusion to enhance wound healing at a faster rate. This property of hyperbaric oxygen therapy to deliver higher oxygen to the wound bed with dermal substitute and skin graft is utilized in this study to reduce the time period of treatment of soft tissue loss with dermal matrix and skin grafting. When Hyperbaric oxygen therapy is used, the whole procedure could be done in one stage as wound debridement, Dermal substitute and skin grafting application which reduces the morbidity of the patient and results in functional wound healing.

### **Aim**

To assess the efficacy of uptake of dermal substitute with skin grafting in a single stage procedure for soft tissue cover with hyperbaric oxygen therapy as an adjunct

## **Methodology**

The study was conducted in the department of Plastic surgery and Burns during the period of June 2022 to December 2022. A total of 10 patients with soft tissue defect was covered with dermal substitute and skin grafting in a single stage with hyperbaric oxygen therapy as an adjunct for soft tissue reconstruction.

## **Results**

Of the 10 patients with soft tissue defect, 7 patients were with soft tissue defect in the leg region. Among the seven patients, three were chronic ulcer and three were of post traumatic leg defects, one was chronic ulcer due to peripheral vascular disease. 2 patients were post burn contracture release and reconstruction, one was with soft tissue defect due to post irradiation sternal wound dehiscence. All the wounds healed well without any complications. All patients were subjected to Hyperbaric Oxygen Therapy for six sessions.

## **Conclusion**

Hyperbaric oxygen therapy as an adjunct is helpful in a single stage reconstruction of soft tissue defect with dermal substitute and skin grafting. Further studies should be done on different thickness of dermal matrix application and utility of HBO therapy for the same.

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