" ASSESSMENT OF FUNCTION, QUALITY OF LIFE AND PSYCOMETRIC ANALYSIS OF PATIENTS BEFORE AND AFTER DELIVERING OF DENTURES MADE BY PROSTHODONTIST AND NON-PROSTHODONTIST "

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In

PROSTHODONTICS, CROWN & BRIDGE AND IMPLANTOLOGY

By

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Date: 1st. July. 2021

Place: Lucknow

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This is to certify that the dissertation entitled ***" ASSESSMENT OF FUNCTION, QUALITY OF LIFE AND PSYCOMETRIC ANALYSIS OF PATIENTS BEFORE AND AFTER DELIVERING OF DENTURES MADE BY PROSTHODONTIST AND NON-PROSTHODONTIST "*** is a bonafide work done by **Dr. Aishwarya Mehrotra**, under my direct supervision and guidance in partial fulfilment of the requirement for the degree of MDS in Department of Prosthodontics, Crown & Bridge and Implantology.

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Dr. Aishwarya Mehrotra

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LIST OF ABBREVIATIONS

List of Abbreviations	Stands For
MNA	Mini nutritional Index
GOHAI	Geriatric oral health assessment Index
SD	Standard deviation
OHRQOL	Oral health related quality of life
HRQL	Health related quality of life
r	Correlation
p	Level of significance

ABSTRACT

BACKGROUND: Tooth loss is an age-related problem with advancement of age advances, people's ability to look after their teeth is affected because of their reduced physical capacity and income. Quality of life are often understood as "the degree to which an individual enjoys the important possibilities of life". It's multidimensional and depends on the external factors of a personal like social, cultural, economic, and political, health condition and health-related to quality of life like functional state, symptoms, and components of health perceptions and therefore the internal factors of a personal (i.e., biological, lifestyle, health behaviour, personality, and values).A variety of validated instruments assessing the impact of oral health on quality of life has been developed, including the Oral Health Impact Profile (OHIP). The 49 questions within the OHIP capture seven conceptually formulated dimensions (functional limitation, physical pain, psychological discomfort, physical, psychological and social disability, and handicap) on the basis of Locker's (1988) theoretical model of oral health. The Mini Nutritional Assessment (MNA) is a tool used for nutritional screening and assessment due to the convenience of use and also the feasibility in any clinical care setting. Despite being introduced and validated for clinical use about 20years ago, this tool has recently received new attention and has been the thing of reappraisals so as to disseminate more widely the practice of a scientific nutritional screening of the old patient.

AIM: The aim of the study is to assess the function and quality of life in edentulous patients and to evaluate patient's satisfaction with their complete dentures through Dermatoglyphics (finger prints) by Prosthodontist and Non-Prosthodontist.

METHODS: A cross sectional study was done on 12 edentulous participants of Lucknow city from march 2019-december 2019. Participants were equally divided into two groups on the basis of denture fabricated. Nutrition status was assessed on the basis of MNA. Oral health related quality of life was assessed using GOHAI. House classification was used to determine the corelation between phycological behaviour and dermatoglyphics.

RESULT: A positive corelation was found between MNA and GOHAI and dermatoglyphics. The level of satisfaction was more in prosthodontist as compared to non-prosthodontist.

CONCLUSION: The present study shows a corelation between denture adaptability and personality. It was observed that the dentures delivered by prosthodontist has better adaptability when compared to non- prosthodontist.

INTRODUCTION

The value of dentitions in the adult population cannot be overstated. Reduced masticatory performance due to teeth loss may be a significant age-related cause that raises the risk of malnutrition and diseases.[1]

The correlation between tooth loss and dietary intake has been found to be extremely significant masticatory capacity is decreased as a result of tooth loss, resulting in a decrease in food quality. Several studies have found an inverse relationship between gradually weaking dentition and nutritional consumption.[2]

An edentulous individual faces many problems from malnutrition to social acceptance which leads to biological, physiological and psychological problems, if not treated by a suitable prosthesis. One of the modalities of treatment is to provide a complete denture to such individuals. an edentulous patient is provided by a prosthesis which is not expensive, easy to fabricate and simple to use which improves the diet and quality of an individual and is known as Complete denture. When a person is completely edentulous teeth along with the periodontal ligament are completely lost, this has a negative cosmetic and biomechanical implications. Thus, the fabrication of a complete denture to contribute better quality of life for edentulous patient is advised which in turn is focused mainly on the skills and clinical assessment of the dentist.

Patient's adaptation and responses to health-care interventions are now considered a necessary component of the clinical approach. The management of problems faced by the elderly usually involves many of the undesirable compromises, but adaptation to a complete denture is the characteristic of successful ageing. the term quality of life is explained as how well an individual is able enjoy the possibility of life.[3]

It is multidimensional and is affected by external factors such as social, cultural, fiscal, and political factors, as well as internal factors such as health status and health-related quality of life factors such as functional state, signs, and components of health expectations .[4]

An edentulous individual faces many problems from malnutrition to social acceptance which leads to biological, physiological and psychological problems, if not treated by a suitable prosthesis. One of the modalities of treatment is to provide a complete denture to such individuals. an edentulous patient is provided by a prosthesis which is not expensive, easy to fabricate and simple to use which improves the diet and quality of an individual and is known

as Complete denture. When a person is completely edentulous teeth along with the periodontal ligament are completely lost, this has a negative cosmetic and biomechanical implications. Thus, the fabrication of a complete denture to contribute better quality of life for edentulous patient is advised which in turn is focused mainly on the skills and clinical assessment of the dentist.products based on this logic.[8]

The Oral Health Impact Profile is one of several validated instruments for assessing the impact of oral health on quality of life. On the basis of Locker's (1988) theoretical model of oral health, the 49 questions in the OHIP capture seven conceptually formulated measurements emphasising on restriction in function, pain, psychological impairment etc. Different tools, on the other hand, have classified objects into different subject divisions, so the number of categories varies. For the international comparison of self-reported oral health, the occurrence of a group of core constructs is important. Multinational efforts in the area of HRQoL, such as the IQOLA project for the SF-369, this approach is exemplified by the World Health Organization's initiative to create a global HRQoL instrument.[9]

As oral health represents the overall quality of life of an individual and is sensitive in nature compare to any other scale. [10]. In 1990, Atchinson and Dolan developed the GOHAI method. With just 12 objects, the GOHAI is relatively thin. The GOHAI was created with the aim of evaluating the oral health of seniors.[11]

The GOHAI is a scale that tests various facets of oral health[12], and it removes the challenges that come with measuring, which brings uncertainty and subjectivity.[13]

The geriatric oral health assessment is a subjective form of the older population which tells us about their oral health. The aim of a geriatric assessment is to obtain evidence that will help in diagnosis and the recommendation of suitable therapies. Such a metric will make it possible to quantify the prevalence of oral functional issues in older persons, as well as enhance understanding of the psychological implications of oral illness and offer a means to compare the efficacy of different dental care choices in this demographic. The recommendations for the geriatric oral health appraisal index propose using tests to determine the effect of oral health on people's quality of life. Because of its ease of use and adaptability in any health care environment, the Mini Nutritional Assessment is a method used for nutritional screening and assessment. Despite the fact that it was first developed and validated for therapeutic use over 20 years ago, this method has recently gained revived interest and has become the focus of

reappraisals in order to spread the practise of a scientific dietary screening of the elderly patient.[14,15]

The European Society for Medicinal Nutrition and Metabolism now recommends using the Mini Nutritional Appraisal [16]. The advantages of using this instrument include its high sensitivity, reliability among various operators, and ease of use, which enables it to be conducted by non-specialized personnel in a limited period of time. [17]

The patient's low level of involvement is required, and the capacity to cope with various geriatric-specific conditions is appropriate (nutritional and health status, independence, quality of life, cognition, mobility, and subjective health).[18] However, a recent analysis of the literature found a stumbling block in the limited prediction of outcome, especially mortality.[19]

Dermatoglyphics, or the study of fingerprints and skin patterns, is undoubtedly the oldest of all disciplines, having achieved popularity several years ago.[20] Dermal configurations first emerge in the 12th week of pregnancy and are completely developed by the 24th week. Apart from the change in their proportions, they remain stable after that. In their numerous manuscripts, Indian sages have always believed that each natural or acquired bodily mark encodes the owner’s psychology and destiny.[21] The person's entire body reflects their personality. The distinct patterns of emotions, feelings, and behaviours that characterise a person's personality are created.[22]

There is no evidence of a connection between the shape of the palate, denture adaptation, and dermatoglyphics in the literature. As a result, the current study aimed to determine the relationship between prosthodontists and non-prosthodontists in terms of dermatoglyphics, personality, and nutrition.

AIM AND OBJECTIVE

AIM:-

The aim of the study is to assess the function and quality of life in edentulous patients and to evaluate patient's satisfaction with their complete dentures through Dermatoglyphics (finger prints) by Prosthodontist and Non-Prosthodontist.

OBJETIVES:-

- To observe the difference in functions and quality of life before and after delivering the dentures by undergraduates and postgraduates.
- To correlate the relationships between personality of patient with their pattern of finger print and level of satisfaction towards a denture.
- To evaluate the inherent personality trait of each individual patient and use this tool to predict the response of the patient to complete denture therapy and overall prognosis**.**

REVIEW OF ARTICLE

Neil E. Full Denture Practice. Nashville, Tenn Marshall & Bruce (1932)[23] conducted a study to assess the diagnosis is the examination of the physical state, evaluation of the mental or psychological makeup and understanding the needs of each patient to ensure a predictable result. Patient evaluation is the first step to be carried out in treating a patient. The dentist should begin evaluating the patient as soon as he/she enters the clinic.

Seifert I, Langer A, Michmann J (1962)[22] did a study to assess the evaluation of psychologic factors in geriatric denture patients. This study investigated the relationship between satisfaction with complete dentures and some psychologic factors. New dentures were made for 130 patients who were investigated during their treatment. A neuroticism scale and the Health Locus of Control scale were used to investigate the patient's personality. The patient-dentist relationship was evaluated by asking patients their opinions about the treatment, and patient attitude toward dentures in general and their expectation toward the new dentures were evaluated by means of a questionnaire. No relationship was found between dissatisfaction and patient personality. A low relationship was found between dissatisfaction and the patient's opinion about the treatment, and a moderate relationship was found between dissatisfaction and the patient's attitude toward dentures. A patient's attitude toward dentures, measured by the questionnaire before new dentures were received, is a prospective tool for patient satisfaction with new dentures.

Atchinson KA, Dolan TA (1990)[24] did a study on development of the Geriatric Oral Health Assessment Index. This paper describes the rationale for and the development of the Geriatric Oral Health Assessment Index (GOHAI), a self-reported measure designed to assess the oral health problems of older adults. Following a review of the literature and consultation with health care providers and patients, a pilot instrument was developed. The GOHAI was initially tested on a convenience sample of 87 older adults. A revised instrument was then administered to a sample of 1755 Medicare recipients in Los Angeles County. The GOHAI demonstrated a high level of internal consistency and reliability as measured by a Cronbach's alpha of 0.79. Associations of the GOHAI with a single-item rating of dental health and with clinical and sociodemographic supported the construct validity of the index. Having fewer teeth, significantly related to a worse (lower) GOHAI score. Respondents who were white, well educated, and with a higher annual household income were more likely to have a high GOHAI

score, indicating fewer dental problems. Additional applications of the GOHAI are necessary to further evaluate the instrument's validity and reliability, and to establish population norms of oral health in older adult populations as measured by the GOHAI.

Patrick DL, Erickson P (1993)[7] health status and health policy conducted a study on quality of life in health care evaluation and resource allocation. A new Subjective Quality of Life (SQoL) Instrument for in patient and community mental health settings was developed by the interRAI research collaborative to support evaluation of quality in mental health settings from the person's perspective. Ratings of SQoL provide important information about the quality of service and patient experience with the care they receive. This information can help staff to improve approaches to each person's plan of care in a manner that is meaningful to the individual. This study examined the reliability of the SQoL-MH. 83 inpatients from several clinical departments in a mental health center in South Western Ontario, Canada were randomly assigned to either be interviewed or complete the assessment on his or her own. Reliability was tested using Cronbach's Alpha. A preliminary factor analysis points to four SQoL-MH subscales with very good internal consistency, ranging from 0.83 to 0.90. Once finalized, the Subjective Quality of Life instrument will be integral to the interRAI suite of instruments used to assess persons with mental health needs. A reliable and valid SQoL-MH instrument will allow mental health service providers to shape or modify care environments in order to enhance quality of life. In addition, the SQoL-MH instrument could also benefit advocacy groups who use reports on quality of life to influence social policy development and funding decisions.

WHOQOL group (1993)[11] did a Study protocol for the World Health Organization project to develop a Quality-of-Life assessment instrument (WHOQOL). The World Health Organization (WHO) has undertaken a project to develop an instrument (the WHOQOL) for measuring quality of life. Quality of life is defined as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, and their relationship to salient features of their environment. The instrument will be developed in the framework of a collaborative project involving numerous centres in different cultural settings. In addition, it will have proven psychometric properties of validity, responsiveness and reliability and will be sensitive to the cultural setting in which it is applied, whilst maintaining comparability of scores across different cultural settings. This paper outlines the

characteristics of the planned instrument and the study protocol governing work on its development. To date steps 1 through 5 have been completed and work is progressing on step 6. It is anticipated that the instrument will be available for piloting in July 1993 and a final version available for use in June 1994.

Locker D (1994)[8] conducted health outcomes of oral disorders. In Dentistry, as in other branches of Medicine, it has been recognised that objective measures of disease provide little insight into the impact of oral disorders on daily living and quality of life. A significant body of development work has been undertaken to provide health status measures for use as outcome measures in dentistry. In descriptive population studies, poor oral health related quality of life is associated with tooth loss. There is a less extensive literature of longitudinal clinical trials, and measurement of change and interpretation of change scores continues to pose a challenge. This paper reviews the literature regarding the development and use of these oral health related QoL measures and includes an appraisal of future research needs in this area

Slade GD (1997)[9] conducted a study on derivation and validation of a short-form Oral Health Impact Profile. This study aimed to derive a subset of items from the Oral Health Impact Profile (OHIP-49)-a 49-item questionnaire that measures people's perceptions of the impact of oral conditions on their well-being. Secondary analysis was conducted using data from an epidemiologic study of 1217 people aged 60+ years in South Australia. Internal reliability analysis, factor analysis and regression analysis were undertaken to derive a subset (OHIP-14) questionnaire and its validity was evaluated by assessing associations with sociodemographic and clinical oral status variables. Internal reliability of the OHIP-14 was evaluated using Cronbach's coefficient alpha. Regression analysis yielded an optimal set of 14 questions. The OHIP-14 accounted for 94% of variance in the OHIP-49; had high reliability (alpha = 0.88); contained questions from each of the seven conceptual dimensions of the OHIP-49; and had a good distribution of prevalence for individual questions. OHIP-14 scores and OHIP-49 scores displayed the same pattern of variation among sociodemographic groups of older adults. In a multivariate analysis of dentate people, eight oral status and sociodemographic variables were associated ($P < 0.05$) with both the OHIP-49 and the OHIP-14. While it will be important to replicate these findings in other populations, the findings suggest that the OHIP-14 has good reliability, validity and precision.

Allen PF, Locker D (1997)[14] conducted a study on assessment using the oral health impact profile. This study investigated the association between sociodemographic, behavioral, oral health, variables of drug consumption, and the short version of the Oral Health Impact Profile (OHIP-14), in Southern Brazilian drug users.

Atchinson KA, Der-Martirosian C, Gift H (1998)[13] did a study on components of self-reported oral health and general health in racial and ethnic groups. This paper identifies the what, why, and how of OHRQoL and presents an oral health theoretical model. The relevance of OHRQoL for dental practitioners and patients in community-based dental practices is presented. Implications for health policy and related oral health disparities are also discussed. A supplemental Appendix contains a Medline and ProQuest literature search regarding OHRQoL research from 1990-2010 by discipline and research design (e.g., descriptive, longitudinal, clinical trial, etc.). The search identified 300 articles with a notable surge in OHRQoL research in pediatrics and orthodontics in recent years.

Ware JE Jr, Gandek B (1998)[10] gave an overview of the SF-36 Health Survey and the International Quality of Life Assessment (IQOLA) Project. Studies of the factor structure of the SF-36 Health Survey are an important step in its construct validation. Its structure is also the psychometric basis for scoring physical and mental health summary scales, which are proving useful in simplifying and interpreting statistical analyses. To test the generalizability of the SF-36 factor structure, product-moment correlations among the eight SF-36 Health Survey scales were estimated for representative samples of general populations in each of 10 countries. Matrices were independently factor analyzed using identical methods to test for hypothesized physical and mental health components, and results were compared with those published for the United States. Following simple orthogonal rotation of two principal components, they were easily interpreted as dimensions of physical and mental health in all countries. These components accounted for 76% to 85% of the reliable variance in scale scores across nine European countries, in comparison with 82% in the United States. Similar patterns of correlations between the eight scales and the components were observed across all countries and across age and gender subgroups within each country. Correlations with the physical component were highest (0.64 to 0.86) for the Physical Functioning, Role Physical, and Bodily Pain scales, whereas the Mental Health, Role Emotional, and Social Functioning scales correlated highest (0.62 to 0.91) with the mental component. Secondary correlations for both clusters of scales were much lower. Scales measuring General Health and Vitality correlated moderately with both physical and mental health components. These results support the

construct validity of the SF-36 translations and the scoring of physical and mental health components in all countries studied.

Chiang YP in (2000)[4] conducted a study on Measurement of health outcomes in treatment effectiveness evaluations: conceptual and methodological challenges. Major challenges in the evaluation of the "end results" of health services include ensuring that concepts are correctly defined and measured, that the validity of measures used in different applications and populations is well documented, and that observed effects can be clearly interpreted. Thus, there are no valid instruments per se. Validity in use, including responsiveness, interpretation of effects, and generalizability to diverse populations, is the most important measurement characteristic for treatment effectiveness. An evaluation of the validity of preference-based measures is particularly important for the interpretation and comparability of outcomes in cost-effectiveness evaluations. The successful translation of research into policy and practice is limited by the extent to which these critical issues are addressed in actual treatment evaluations.

Broder HL, Slade G, Caine R, Reisine S in (2000)[12] conducted a study on perceived impact of oral health conditions among minority adolescents. This study assessed the perceived impact of oral health conditions, and the relationship of two measures of self-reported outcome, the RAND SF-36 and the Oral Health Impact Profile (OHIP), to clinical indicators of oral health among inner-city adolescents.

Sheiham A, Steele JG, Marcenes W, Lowe C, Finch S, Bates CJ (2001)[3] assessed the relationship among dental status, nutrient intake, and nutritional status in older people. The objective of this part of the National Diet and Nutrition Survey was to assess if there is a relationship between dental status in people 65 years and older and intake of certain nutrients and any link between dental status and blood-derived values of key nutrients. Random national samples of independently living subjects and those living in institutions had dental examinations, interviews, four-day food diaries, and blood and urine analysed. In the sample living independently, intakes of most nutrients were lower in edentate than dentate subjects. Intake of non-starch polysaccharides, protein, calcium, non-heme iron, niacin, and vitamin C was significantly lower in edentate subjects. People with 21 or more teeth consumed more of most nutrients, particularly of non-starch polysaccharide. This relationship in intake was not apparent in the hematological analysis. Plasma ascorbate and plasma retinol were the only analytes significantly associated with dental status.

Hutton B, Feine J, Morais J (2002)[25] did a study on association between edentulism and nutritional state. Edentulous people have difficulty chewing foods that are hard or tough in texture, even when wearing well-made dentures. These individuals typically modify their diets to compensate for loss of oral function. This practice leads to the question of whether the diet of edentulous individuals is adequate to maintain good general health. This overview summarizes articles that describe the changes in diet associated with edentulism. Such changes include reductions in fruits, vegetables, meats and other hard-to-chew foods and are associated with compromised nutrition. The evidence suggests that edentulous individuals lack specific nutrients and, as a result, may be at risk for various health disorders. The authors have recently shown that mandibular prostheses supported by only 2 implants may significantly improve nutritional status in edentulous patients.

Hegarty AM, McGrath C, Hodgson TA, Porter SR (2002)[6] did a study on patient-centred outcome measures in oral medicine. The present study evaluates the performance of patient-centred outcome measures in the oral medicine setting in patients with oral lichen planus. The study included 48 patients with a histologically confirmed diagnosis of oral lichen planus who completed a questionnaire incorporating two patient-centred outcome measures: the 16-item UK Oral Health Related Quality of Life Measure (OHQOL-UK) and 14-item Oral Health Impact Profile (OHIP-14). They subsequently underwent an oral examination and rated the pain they experienced on a visual analogue scale (VAS). The impact of oral health on their life quality was considerable with physical, social and psychological consequences. Both OHQOL-UK ($P<0.01$) and OHIP-14 scores ($P<0.01$) were associated with clinical findings; demonstrating criterion validity. Patient rating of pain experienced (on a VAS) correlated with OHQOL-UK scores ($P<0.01$) and OHIP-14 ($P<0.01$); demonstrating construct validity. The mean inter-item correlation for OHQOL-UK was 0.93 and was 0.90 for OHIP-14; demonstrating high internal consistency reliability. Our results suggest both OHQOL-UK and OHIP-14, patient-centred outcome measures perform well in patients with oral lichen planus, demonstrating validity and reliability. This implies patient-centred outcome measures may be utilized in both oral medicine and oral and maxillofacial surgery to assess patient needs and opinions

Guigoz Y (2006)[26] conducted a study on Mini Nutritional Assessment (MNA) wrote a review on the MNA to Spring 2006, we searched MEDLINE, Web of Science and Scopus, and did a manual search in J Nutr Health Aging, Clin Nutr, Eur J Clin Nutr and free online available publications.

Gil–Montoya JA, Subira C, Ramon, JM, and Gonzalez-Moles MA (2008)[27] conducted a study on Oral health related quality of life and nutrition status. This study examines whether oral health-related quality of life (OHRQoL) is associated with malnutrition risk in the elderly. A cross-sectional study was designed using a representative sample of Spaniards over 65 years old. Data on sociodemographics and oral health status were gathered by interview and examination. Oral health-related quality of life was evaluated using the Geriatric Oral Health Assessment Index (GOHAI), and malnutrition risk using the Mini Nutritional Assessment (MNA).

Abellan van Kan G, Rolland Y, Bergman H, et al (2008)[15,16] conducted a frailty assessment of older people in clinical practice expert opinion of a geriatric advisory panel. Frailty is a commonly used term indicating older persons at increased risk for adverse outcomes such as onset of disability, morbidity, institutionalisation or mortality or who experience a failure to integrate adequate responses in the face of stress. Although most physicians caring for older people recognize the importance of frailty, there is still a lack of both consensus definition and consensual clinical assessment tools. The aim of the present manuscript was to perform a comprehensive review of the definitions and assessment tools on frailty in clinical practice and research, combining evidence derived from a systematic review of literature along with an expert opinion of a European, Canadian and American Geriatric Advisory Panel (GAP). There was no consensus on a definition of frailty but there was agreement to consider frailty as a pre-disability stage. Being disability a consequence rather than the cause of frailty, frail older people do not necessarily need to be disabled. The GAP considered that disability (as a consequence of frailty) should not be included in frailty definitions and assessment tools. Although no consensual assessment tool could be proposed, gait speed could represent the most suitable instrument to be implemented both in research and clinical evaluation of older people, as assessment of gait speed at usual pace is a quick, inexpensive and highly reliable measure of frailty.

Emanuele Cereda a,Laura Valzolgher b, Carlo Pedrolli b (2008)[28] validate the use of Mini Nutritional Assessment (MNA) with respect to functional status in institutionalised elderly.

De Andrade FB, de França Caldas A Jr., Kitoko PM (2009)[29] conducted a study on relationship between oral health, nutrient intake and nutritional status in a sample of Brazilian elderly people. To evaluate the relationship between the oral health condition, the nutrient intake and the body mass index (BMI) in elderly people.

Shigli K, Hebbal M (2010)[30] conducted a study on assessment of change in oral health-related quality of life among patients with complete denture before and 1month post-insertion using geriatric oral health assessment index. Geriatric Oral Health Assessment Index (GOHAI) is a 12-item measure of "patient-reported oral functional problems" intended for use in the assessment of the effectiveness of dental treatment.

Kaiser MJ, Bauer JM, Rämsch C, Uter W, Guigoz Y, Cederholm T, et al (2010)[17] conducted a study on frequency of malnutrition in older adults: a multinational perspective using the mini nutritional assessment. To provide pooled data on the prevalence of malnutrition in elderly people as evaluated using the Mini Nutritional Assessment (MNA) treatment.

Cereda E, Pedrolli C, Zagami A, Vanotti A, Piffer S, Opizzi A, et al (2011)[18] did a study on body mass index and mortality in institutionalised elderly. The purpose of this study is to assess the association between body mass index (BMI) and mortality among nursing home residents in Japan. A one-year prospective cohort study was conducted with 8,510 elderly individuals across 140 nursing homes. Baseline measurements included age, sex, height, weight, BMI, activities of daily living (ADL) (Barthel Index), and degree of dementia. Information regarding dates of discharge and mortality were also obtained to calculate person-years. Cox's proportional hazards model was used to estimate hazard ratios.

Rasmi Paturu , Padmanabhan Thallam Veeravalli, Anand Kumar Vaidyanathan, Manita Grover (2011)[2] did a pilot study for Evaluation of Nutritional Status and Eating Pattern in First and Second-Time Denture Wearers. Fourteen patients were selected for this study. Seven of them with four or five teeth remaining without any functional units and seven patients who were known cases of complete denture wearers with ill-fitting or worn-out dentures. The results of the study analyzed the change in eating pattern and hence the nutritional status of two groups of edentulous subjects; Group I (patients who underwent a recent transition from partially edentulous state to a completely edentulous state), and Group II (known complete denture wearers for five to ten years). Clinical examination of Group I showed an improvement, by, the decrease in percentages in both the paleness of the conjunctiva and nails of the selected patients. In Group II, there was a significant change in anthropometry and iron intake and the clinical examination showed positive changes in the patient's normal appearance, eyes and nails. This study emphasizes that every complete denture wearer needs to be periodically counseled by a registered dietician and dentist for checkup to avoid malnutrition and disease.

Boggula Rama Mohan Reddy (2013)[21] did a comparative study on Dermatoglyphics in Individuals with Normal Occlusions and Malocclusions. Dermatoglyphics is the study on epidermal ridges on the palmar and plantar surfaces of the feet and hand. Embryological development of orodental structures and these dermal patterns occur during the same period. The environmentally influenced genetic predisposition is found in different types of malocclusions. This malocclusion should also exhibit different dermal patterns which are unique for each class.

Kshetrimayum N, Reddy CV, Siddhana S, Manjunath M, Rudraswamy S, Sulavai S (2013)[31] conducted a study on Oral health-related quality of life and nutritional status of institutionalized elderly population aged 60 years and above in Mysore City, India. To assess whether oral health-related quality of life (OHRQoL) is associated with nutritional status in the institutionalised elderly population of Mysore.

El Osta N (2013)[32] conducted a study to explore the associations between nutritional deficit and measures of oral health in a group of elderly.

Bhatt V S, Prasad D Krishna, Malli P (2014)[33] did a survey to assess patient satisfaction after receiving complete denture prosthesis in A.B. Shetty memorial institute of dental sciences. Conventional complete denture therapy is the most extensively used form of treatment for replacement of missing dentition. Patient satisfaction plays a major role in determining the success during treatment procedures. It helps in assessment of certain psychological traits and the impact of complete denture prostheses on daily living. This study was done to evaluate the relationship between patient satisfaction and the newly constructed denture prostheses, as it would indicate the degree of success of the treatment given.

Patel P, Shivakumar KM, Patil S, Suresh KV, Kadashetti V (2015)[34] did a study on association of oral health-related quality of life and nutritional status among elderly population of Satara district, Western Maharashtra, India. To evaluate the oral health-related quality of life (OHRQOL) and nutrition status and association between nutritional status, and OHRQOL in the elderly. Materials and Methods: A cross-sectional study was conducted among the elderly of Karad city. The elderly were subjected to type 3 oral examination. Data regarding the nutritional status and OHRQOL were obtained using Geriatric Oral Health Assessment Index (GOHAI) and mini nutritional assessment (MNA) index. Descriptive statistics was used to analyse data using SPSS version 21. The sample included 200 elderly, of which 59% consisted of males, and 41% are females. The majority of study subjects (46%) were between age group

61 and 70 years. Among the assessed subjects, nearly 95% of them had total scores of GOHAI between 12 and 57 which require "needed dental care." As per MNA, 3.5% had adequate nutrition, 60% were at risk of malnutrition, and remaining 36.5% of subjects were malnourished. There was a significant correlation between GOHAI and MNA scores. Conclusion: Nutritional status was associated with the poor OHRQOL among the elderly. A strong association was found between mean GOHAI and MNA scores and nutrition status and OHRQOL.

Banerjee R, Chahande J, Banerjee S, Radke U (2018)[35] did a study on evaluation of relationship between nutritional status and oral health related quality of life in complete denture wearers. The prevalence of malnutrition increases with old age, especially in developing countries like India, and it is the most common cause of morbidity and mortality, /because of many factors out of which dentate status is one.

METHODOLOGY

The present cross-sectional study was done to assess the function, quality of life and psychometric analysis of patient before and after delivering of dentures made by prosthodontics and non-prosthodontics.

STUDY AREA -The study was conducted in the department of prosthodontics of Babu Banarasi das college of dental sciences, Lucknow.

STUDY DESIGN- A descriptive cross-sectional epidemiological study was conducted.

METHOD- Questionnaire for chewing ability, GOHAI (GERIATRIC ORAL HEALTH ASSESSMENT INDEX) and nutritional status, and wherever necessary changes were made in the questionnaire Data was collected in two phases:

Phase one included data collection prior to complete denture introduction (baseline) and phase two included complete denture insertion. Phase 2 involves data collection after placement and complete denture being used at the 3rd and 6th months. For recording the Dermatoglyphics patterns, the subjects were instructed to wash their hands with soap and water before procedure.

Assessment of Finger Tip Patterns: The finger prints so obtained were assessed and the number of triradiiie, the point where three dermal ridges meet, was discerned. On the basis of the number of triradii present, three types of finger tippatterns, namely arches, whorls and loops were identified.

a) Arches: Simple patterns lacking any triradius or any abrupt ridge curvatures were identified as arches.

b) Loops: Configurations demonstrating a single triradius, with the ridges being abruptly received at one extremity and continuing in the opposite direction in the manner of an open field were identified as loops.

c) Whorls: The most complex patterns with two triradii were identified as whorls[36].

Researchers have suggested that the formation of epidermal ridges on the fingertips of fetus starts from 10th to 16th week of pregnancy and on 16th week the patterns of epidermal ridge get established and don't get changed thereafter[37].

According to yoga philosophy this is about the same time the soul enters the body. There are basically three types of fingerprint patterns: whorls, loops, and arches. Upon examination of the patterns in the fingerprints we can see that it takes a different type of energy to create the pattern of the whorl than it would to create the arch[37]. The information encoded in the fingerprints is soul level information. The combination of fingerprints in relation to the fingers that they appear on palm creates a code. This code forms a map that tells why we have come here in this lifetime[12].

JUDGING CHARACTER OF INDIVIDUAL BASED ON FINGERPRINTS

Fingerprints and their patterns serve as a valuable tool for assessing the character of a person both in eastern and western palmistry. Each pattern in a fingerprint like appearance of Star, Island, Cross, Triangle, Forks, Chain, Grill and Bar has its own significance depending on the position where they appear. However, in this context only the basic patterns and their connotations with respect to the behavioural aspect of the human beings are being considered[10]. Loops They are the most common pattern found on fingertips, especially on the thumb. People with a lot of loops get along well with everyone. If one has them, he is very adaptable to new social situations and interested in everything and everyone[37].

Whorls People with whorls, which look like circles, have a strong will and are more controlling and individualistic than others, but they can also be uniquely dynamic and creative — in a "tortured genius" kind of way. They dislike doing anything the way others would like them to and conforming to a set standard[37].

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STUDY POPULATION-

• Inclusion criteria

1.Age above 40 years

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3.Clinically edentulous and alveolar ridges are normal i.e. No pathology.

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1.Partial edentulous condition

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3.TMJ disorders

4.Any burns, injuries, deformities or disease such as psoriasis Involving fingers.

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PILOT STUDY- Pilot study consisting of 3 participants was conducted in the department. Examiner calibration and training of recording clerks has been done at the same time. The team consisted of principal investigator, recording clerk and organising clerk.

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SCHEDULE- The collection of data was carried for 6th months from March 2019-December 2019. Participants were called at 3 intervals – before insertion of denture and after the denture is delivered at 3rd and 6th month. SAMPLE SIZE- The sample size was estimated using G-power analysis keeping the power of the study at 80% with confidence interval of 95%. Alpha error of 5%, beta error of 20%.

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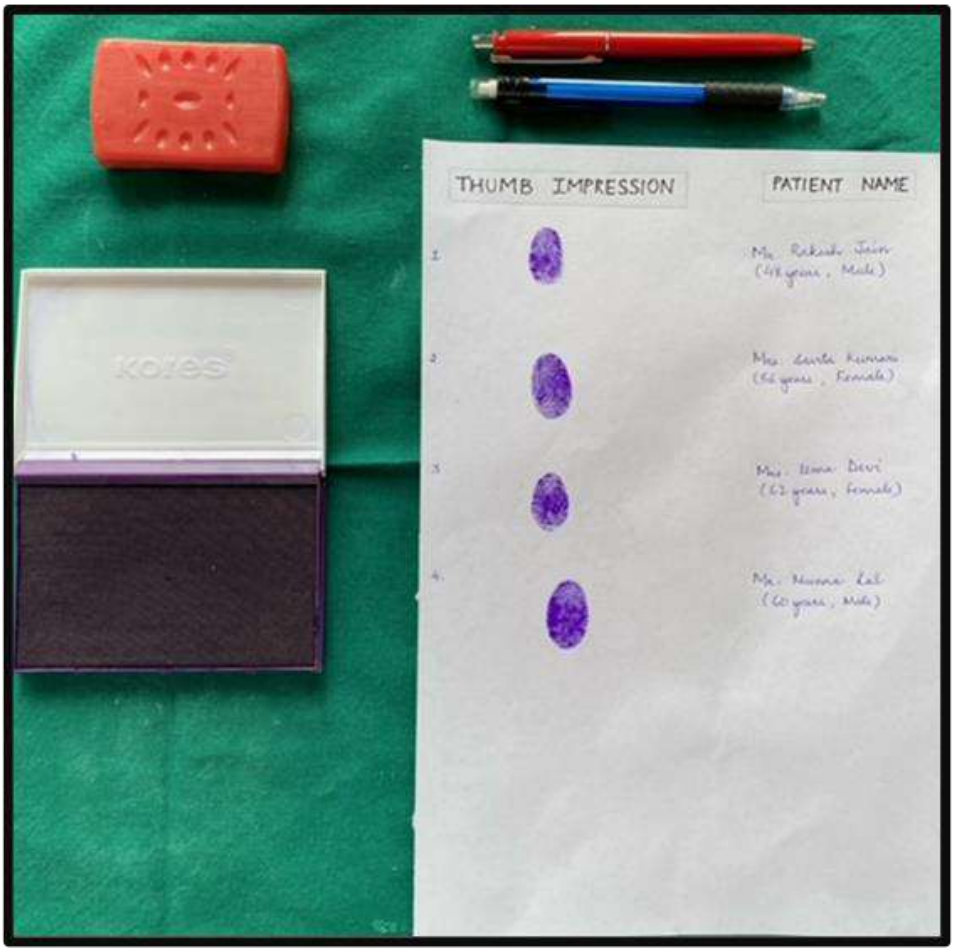
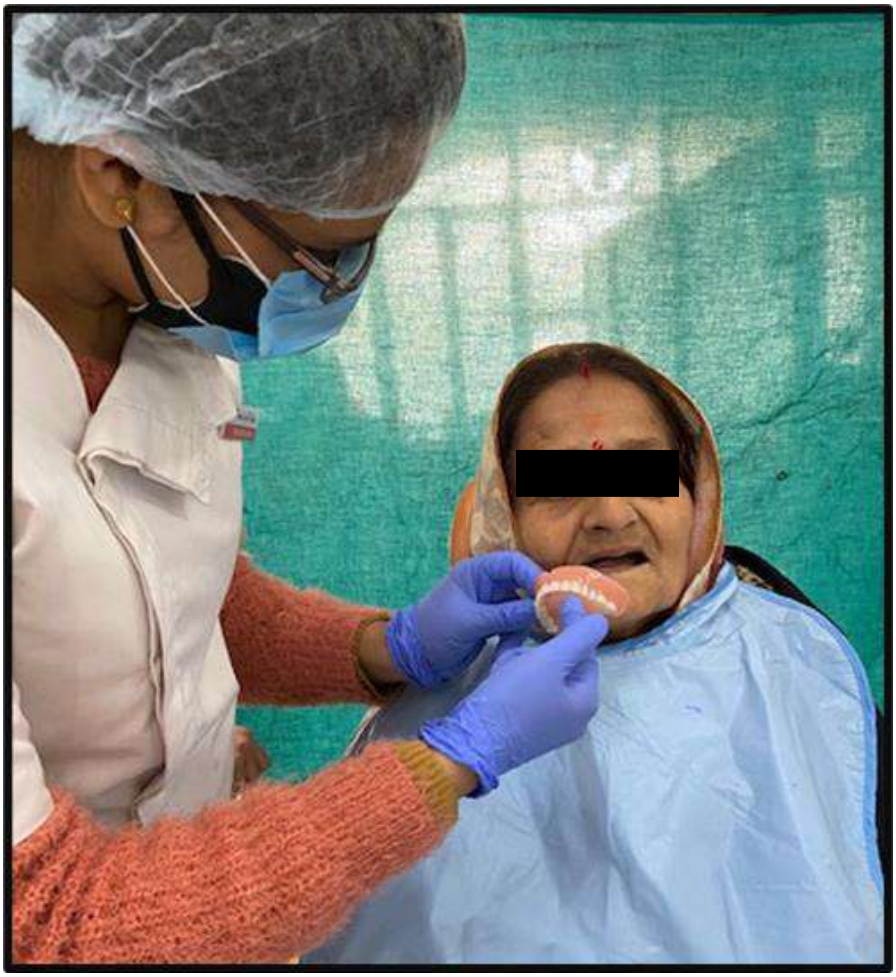


Fig 1: Armamentarium

Fig 2: Guiding the patient for thumb impression



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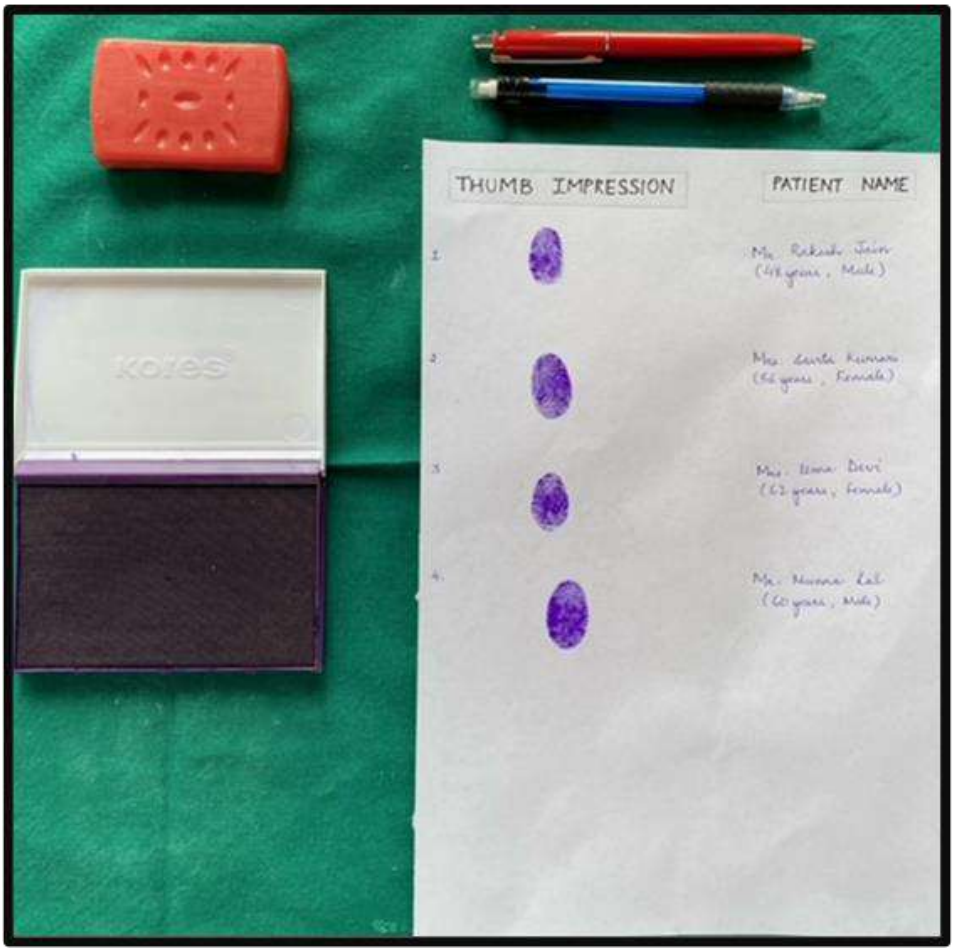


Fig 1: Armamentarium

Fig 2: Guiding the patient for thumb impression

Fig 3: Denture insertion

RESULTS AND OBSERVATIONS

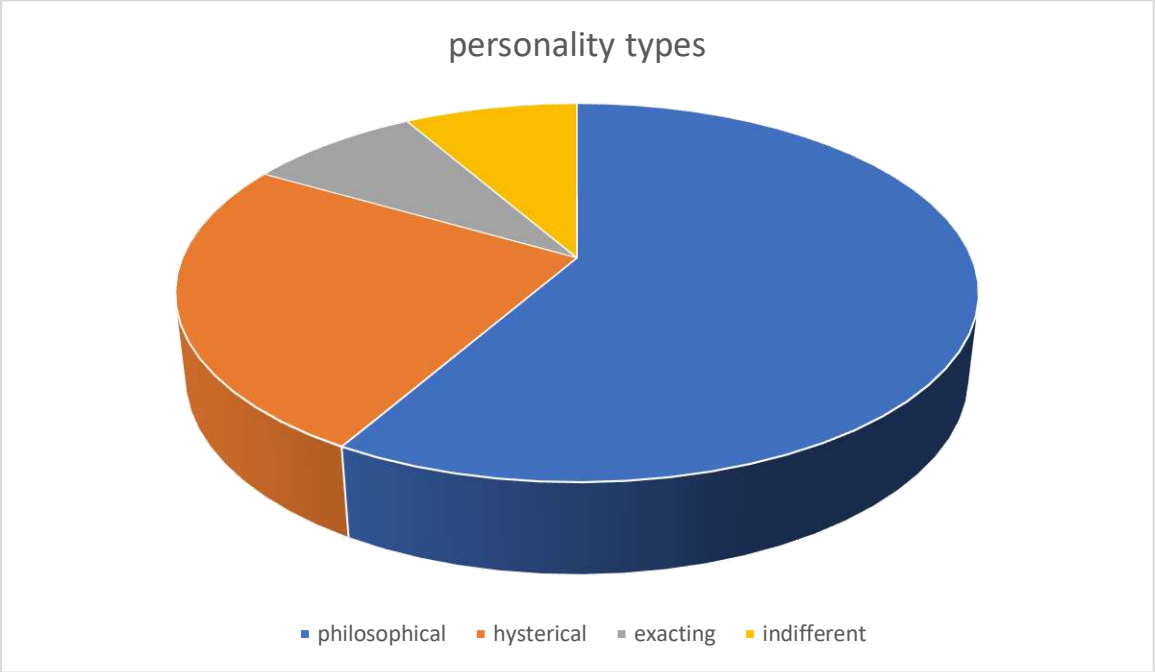
The present cross-sectional study was conducted in the Department of Prosthodontics, Babu Banarasi Das College of Dental Science, Lucknow to assess the role of psychometric analysis as a prognostic tool of level of denture satisfaction. A total of 12 edentulous patients attending the department for denture were enrolled in the study. All the patients were subjected to Psychometric analysis and following results were inferred.

1. Distribution of Study Population according to type of Personality:

With use of Dermatoglyphics, participants personality was adjudged as Philosophical, exacting, indifferent or Hysterical. After psychometric analysis 7 (58.4%) patients were found to have Philosophical personality,3 (25%) had hysterical personality whereas 1(8.3%) had exacting personality also 1 (8.3%) had indifferent personality Distribution of patients according to type of personality is given in Table 1.

Table 1: Distribution of Study Population according to type of Personality based on House classification

SN	**Type of personality**	**No. of patients (Frequency)**	**Percentage**
1.	Philosophical	7	58.4%
2.	Exacting	1	8.3%
3.	Indifferent	1	8.3%
4.	Hysterical	3	25%
5.	Total	12	100.0



Graph 1: Pie chart showing Distribution of Study Population according to type of Personality based on House classification

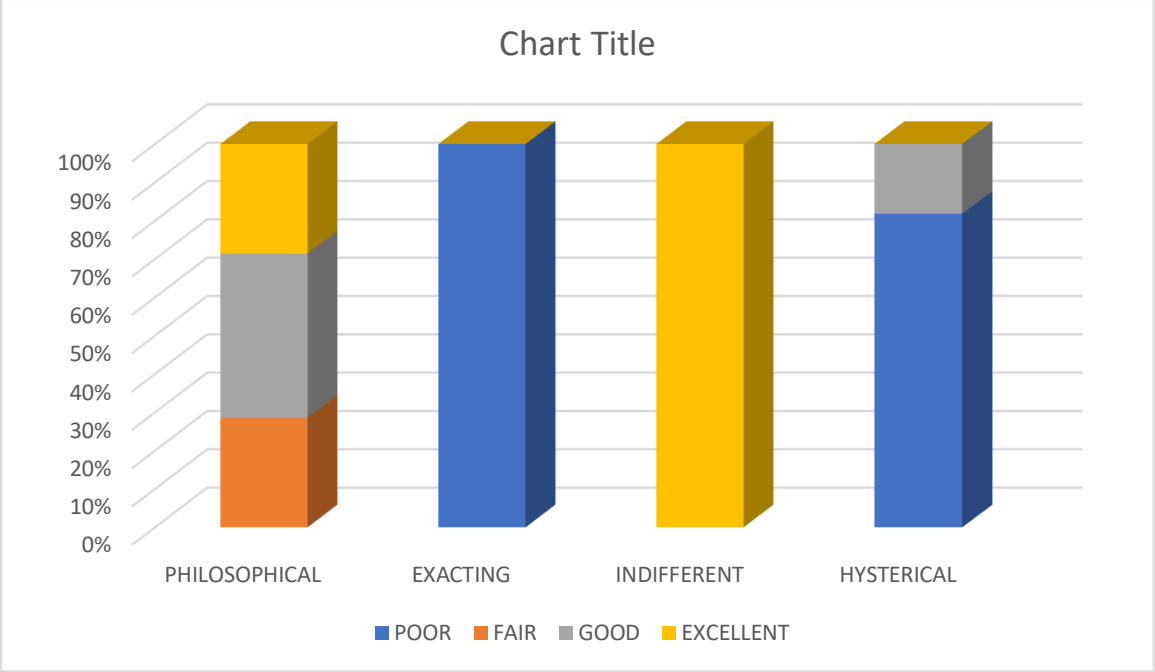
2. Association of Level of Satisfaction and Type of Personality:

Below table 2 shows that none of the patient with Philosophical type of personality had Poor or fair level of satisfaction and none of the patients of Indifferent or hysterical type of personality had Good or Excellent level of satisfaction. It was also observed that majority of Philosophical personality patients had Excellent level of satisfaction (66.66%), Exacting personality had poor level of satisfaction. Indifferent personality had excellent level of satisfaction and majority of Hysterical personality had poor level of satisfaction (66.66%). The result also shows high level of significance as chi square test were applied.

Table 2: Association of Level of Satisfaction and Type of Personality

Satisfaction	**Total (N=12)**	**Philosophical (n=7)**		**Exacting (n=1)**		**Indifferent (n=1)**		**Hysterical (n=3)**	
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Poor	3	0	0.0	1	33.33%	0	0.0	2	66.67%
Fair	2	2	100%	0	0.0	0	0.0	0	0.0
Good	4	3	75%	0	0.0	0	0.0	1	25%
Excellent	3	2	66.67%		0.0	1	33.33 %	0.0	0.0

$\chi^2=33.39(df=9)$; $p<0.001$



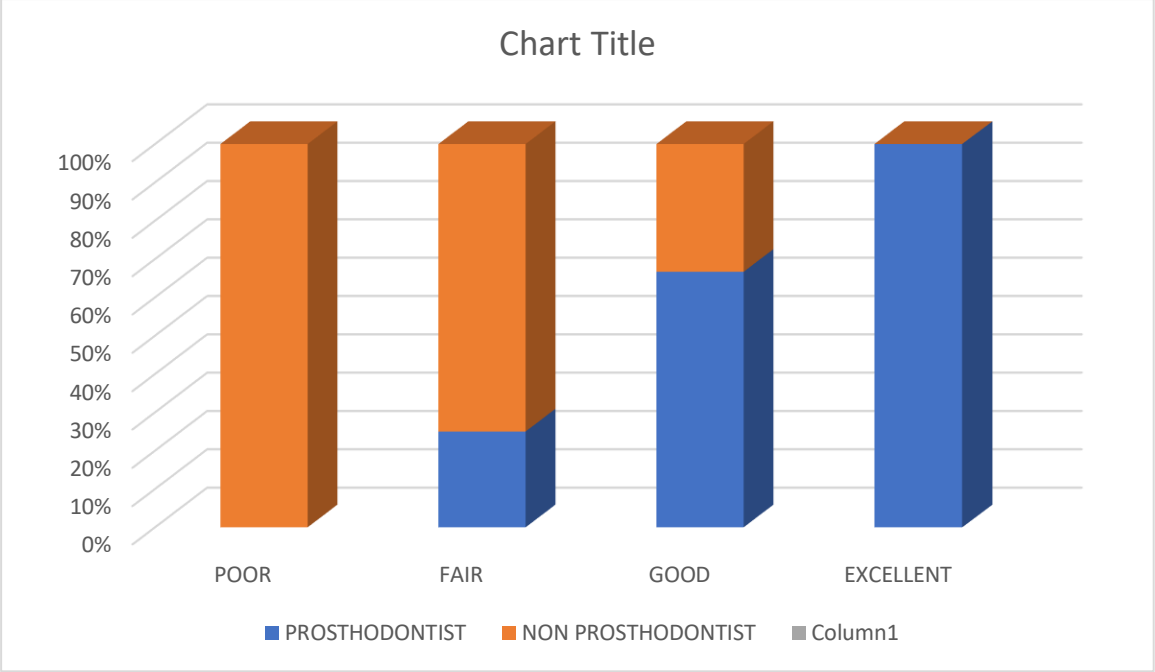
Graph 2: Association of Level of Satisfaction and Type of Personality

A comparison was made between the prosthodontist and non-prosthodontist on basis of level of satisfaction. It was found that level of satisfaction was greater in prosthodontist was significant in good and excellent by application of Kruskal Walis test $p<0.05$ as shown in table 3 and presented through bar graph in figure 3 the level of satisfaction was greater compared to non-prosthodontist.

Table 3: Distribution and comparison of satisfaction between prosthodontist and non-prosthodontist

Satisfaction	Prosthodontist	Non-Prosthodontist	p value
Poor	0	2	0.258
Fair	1	3	0.419
Good	2	1	0.025
Excellent	3	0	0.034

P<0.05, Kruskal walis applied.



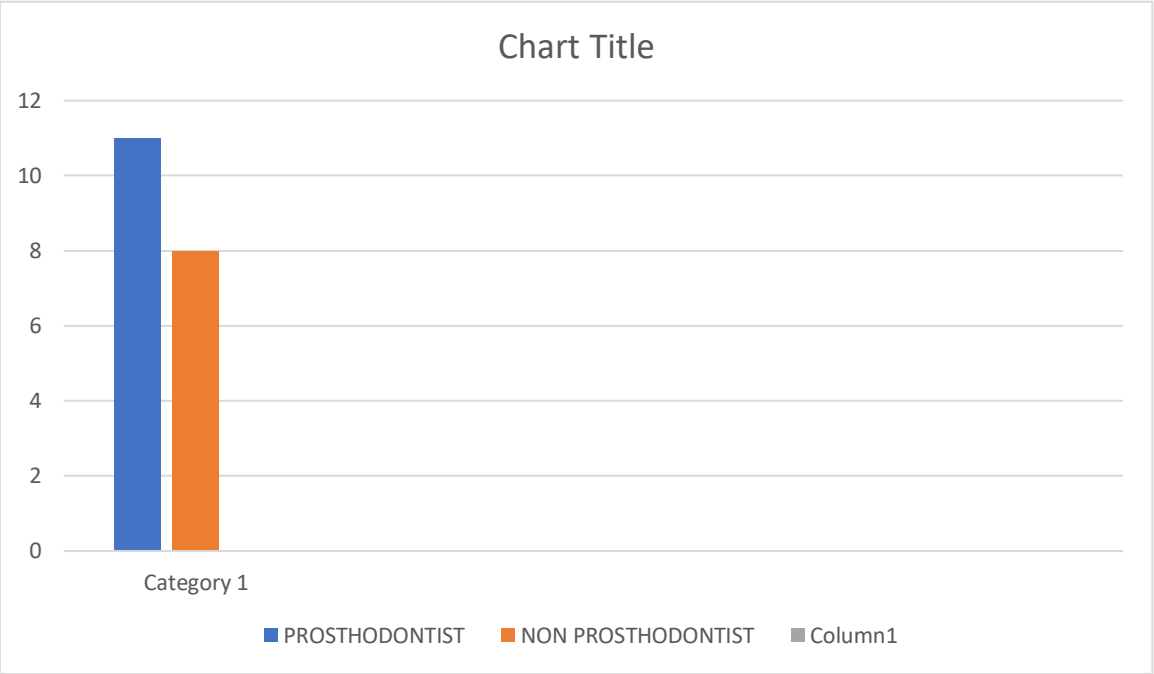
Graph 3: Distribution and comparison of satisfaction between prosthodontist and non-prosthodontist

A comparison was made on basis of nutrition using MNA. The result showed that better nutrition was observed among the patients who were treated by prosthodontist, the mean for prosthodontists was found to be 11.83+/-1.94 whereas for non-prosthodontist it was found to be 8.66+/-3.38 the result was found to be significant as shown in table 5. The mean was found to be higher for prosthodontist when compared to non-prosthodontist. The GOHAI scores as well was found to be better for prosthodontist as compared to non-prosthodontist.

Table 4: Comparison of nutrition between Prosthodontist and Non-Prosthodontist based on nutrition

Nutrition	Prostho	Non Prostho	p value
MNA	11.83+/-1.94	8.66+/-3.38	0.043
GOHAI	49+/-9.7	39+/-7.3	0.032

P<0.05



Graph 4: Comparison of nutrition between Prosthodontist and Non-Prosthodontist based on nutrition

Pearson's correlation was applied on MNA and GOHAI in table 6. A positive correlation was found between MNA and GOHAI which was found to be significant (p=0.003).

Table 5: showing correlation between MNA and GOHAI

	r^2	p value
TOTAL GOHAI*MNA	0.117	0.003

A Spearman's Rank correlation was used between nutrition and qualification for correlation between the two variables. The result was found to be significant p=0.03.

Table 6: showing Correlations between dermatoglyphics and nutrition

			Prosthodontist	Non prosthodontist
Spearman's rho	Dermatoglyphics	Correlation Coefficient	1.000	.105
		Sig. (2-tailed)	.	0.03
		N	12	12
	Nutrition	Correlation Coefficient	.105	1.000
		Sig. (2-tailed)	0.03	.
		N	12	12

p<0.05

DISCUSSION

Malnutrition is common in aging population, due to various factors of which edentulousness remains the prime concern. Patient satisfaction has been the ultimate goal in any dental treatment. In a patient receiving complete denture prosthesis, many factors have a combined role in achieving his/her satisfaction [24]. For an operating dentist efficient mastication, good aesthetics, comfortable speech and wearing comfort for the patient have been the ultimate concern. To meet both ends of patient dentist relationship and treatment outcome could be achieved by a psychological assessment as related to satisfaction GOHAI is a tool that assesses the oral health is a subjective 12-items questionnaire keeping in mind physical functions, psychosocial functions and pain or discomfort of elderly population [25,30].

To evaluate the success of dental treatment in elderly GOHAI is used. In the present study the geriatric Oral health assessment index was used to ass, and the nutritional status was assessed using Mini- nutritional assessment. The result of which was correlated with dermatoglyphics and psychometric analysis was done a comparison was made between the complete dentures delivered by post graduates of prosthodontics and other branches. The MNA is a multidimensional tool that addresses several features of the patient, particularly anthropometry, dietetic habits and the general state [26]. The MNA has been widely used in clinical research and a consistent mass of data is now available. tool has been designed specifically for elderly patients. It allows grading nutritional status in an unique way and in a timely manner having the tool itself a high inter-rater reliability and clearly defined thresholds[27]. Thus, it appears appropriate for decision-making and guiding nutritional intervention.

To stimulate and increase the diffusion of systematic nutritional assessment among clinicians, apart from the aforementioned historical improvements, the tool has been validated in several ethnicities and ethnic- specific anthropometric cut-points have been set up. Along with this, the MNA has been translated in several languages and a free downloadable iPhone application is now available for a bedside use in any setting (download available at: www.mnaelderly.com/mna_forms.html). Malnutrition has a clear impact on the elderly's overall health and quality of life.

According to studies, oral health has an impact on food choices and nutrient intake, resulting in a variety of nutritional issues. Other studies indicate that edentulous patients with no, or only one, prosthesis (upper or lower) experience more difficulty in chewing solid food, placing them at a greater risk of malnutrition. Inadequate dental status and folate intake in the elderly have been reported to be independent predictors of mortality at 6 years, at least in women. 31 MNA tests, which consist of simple measurements and short questions and can be completed in less than 10 minutes: assessment of the human body, global assessment dietary questionnaire and subjective assessment. Participants with an MNA score of 24 have a healthy nutritional status.

Participants at risk of malnutrition have scores between 17 and 23.5. Protein energy malnutrition is indicated by an MNA score of <17. In the present study the MNA score was found to be lower i.e. 57% which was in accordance to study done by Rajlaxmi et al 32 where 60% of the patient had lower MNA. in it 85.0% of participants had problems with denture which led to difficulty in eating food. Approximately, 80.0% of participants found it difficult while biting or chewing on firm food, 95.0% of participants did not find difficulty in swallowing food, and 85.5% had no problem with speech.90 percent of the population had a GOHAI score of 12 to 57, indicating a need for dental care. Based on the data provided, direct relation was found between quality of life and the nutritional status as patients who had better nutrition status showed better quality of life.

In a study done by Daly et al 33 on 49 participants between 25–74 years of age and reported that poor diet and inappropriate food choice resulted in reduced number of teeth. Patel et al. discovered that 34 people with a negative assessment of their dental health had a lower MNA score in a comparable study. 80% of the participants according to MNA were malnourished and needed dental care based on their GOHAI score. El Osta N 35 conducted a study for the nutritional and oral health conditions on a group of elderly Lebanese. 33.8% of the participant was at risk of malnutrition and 8.5% were malnourished. Among them, 75% suffered from having a poor oral health quality of life, as demonstrated by an ADD-GOHAI score 33. Moreover, 84.7% of them had perceptions of xerostomia and 61.2% had fewer than four FUs. This was similar to studies that found that 64.0e 67.2% of subjects with nutritional deficits had a low stimulated salivary flow rate.[2,26,27] Since hyposalivation is associated with loss of appetite and lack of satisfaction when eating, there is difficulty forming the bolus in the

early masticatory stages, especially with foods rich in fibre, such as meat and vegetables and this discourages their consumption.[38,31] In the elderly, xerostomia could be difficult to treat because of physiological conditions and the use of pharmaceuticals. The low number of FUs in Lebanese elderly with deficient nutrition could be treated if better access to dental care were available. Sheiham et al Found that restricting food due to mastication problems only very rarely resulted in a deficiency in key nutrients detectable by biochemical analysis, which could lead to a clinical nutritional disease. [40] As a result, but instead of actual deficiency, these data should be evaluated in relation to the risk of malnutrition. Regardless of the fact that diagnosing malnutrition requires a more thorough diagnosis can be made, the current findings show a strong link between an OHRQOL measure and malnourishment in people with oral health problems, regardless of the fact that diagnosing undernutrition requires a more thorough assessment of the patient. In another study conducted by Emanuele Cereda baseline, 35 residents were malnourished (20.3%; MNA > 17) and 88 were assessed as being at risk of malnutrition (51.1%; MNA Z 17e23.5). However, with regard to independence in activities of daily living by BI, 66 and 57 subjects were scored BI > 50 and 50, respectively. No association was found with gender. However, residents with poorer functional status were significantly older. It was reported the relationship between MNA, BI and nutritional variables. Taken together, the results obtained from direct comparison of groups and simple correlation model showed that malnutrition was characterized by lower body mass index (BMI), muscle protein mass (AMA), poor nutritional habits, and higher weight loss and self-dependence on activities of daily living. House has never been one to propose the mental classification system for denture patients, which he is credited with inventing. His approach appears to be a complete enlargement and rising popularity of the classification system. “Fitting the personality of the elderly patient is often more difficult than fitting the denture to the mouth,” Jamieson said.38,39 The technique is based on how individuals react to the thought of losing their teeth and how complete dentures affect them. The numerous classifications available in literature highlight the depth of study of psychology of geriatric patient and provide better care for geriatric patients. 38 There are various method of evaluating complete denture patient behaviour some of them as follows: House Classification (around the year 1950) Dr MM House established a categorization based on patient's psychological reactions towards becoming edentulous and adapting to dentures

His contributions to prosthodontics revolutionised the science and art. “House classified patients into four types based on clinical situations:

1) Patient who is philosophical: The philosophical mentality is the best for denture acceptance. Dentures are a way for him to preserve his health and attractiveness, and he considers tooth replacement to be a common treatment. These patients are eager to commit their faith in the dentist's diagnostic and treatment plans. When it comes to replacing their dentures, philosophical patients will listen to their dentist's advice.

2) Exacting: The exacting patient may have all of the positive characteristics of the philosophical patient, but he may require the dentist's undivided attention.

3) Hysterical: Emotionally unstable, excitable, and scared, the hysterical personality is. They hope that the prosthesis will look like a natural tooth.

4) Indifferent: Patients who are indifferent have a questionable or unfavourable prognosis. This patient is unconcerned, if at all; he is apathetic, uninterested, and unmotivated. He has gone a long time without wearing dentures. He disobeys rules, refuses to participate, and frequently blames his poor dental health on the dentist. House paid little attention to how the dentist's treatment and behaviour influence the patient's reactions and behaviours. Regardless of whether the patient is edentulous or dentate,

He proposed new classification includes both the patient and the dentist as co-determinants of treatment outcomes.”

“WINKLERS CLASSIFICATION [39]

Winkler mentioned the patients who fall into the following categories:

1. The hardy elderly: These are the people who, medically and psychologically, are at the top of their game.

2. Senile Aged Syndrome: They are unable to cope with daily pressures and are disease-prone.

3. The contented elderly denture wearer: These individuals are content with their old dentures despite significant complications. They've learnt to live with them and are happy in their current circumstances.

4. The old patient who declines to adopt dentures: An elderly individual who has been losing teeth for a long time and does not want or need complete dentures.

IDEAL PATIENT The ‘ideal' senior denture wearer The ideal dental patient, according to O'Shea, incompliant, sophisticated, and responsive. [40]

Winkler identified four characteristics that define the ideal patient's response.

–Recognizes the need for dental treatment,

- Desire dentures

- Accepts the dentures

- Makes an effort to learn how to use them

OTHER CLASSIFICATIONS [38,39,49,50].

Sharry's designation Patients who can endure wearing their prosthesis backwards, upside down, or sideways are TOLBUDS.

TOLAD: Patients who can tolerate a prosthesis with a little tweaking.

TOLN: Patients who couldn't take it anymore.

2. Blum’s classification

1. Reasonable

2. Unreasonable. The "Difficult Denture Bird," as described by Alex Koper, is a difficulty denture patient who has had a variety of dental treatments. Individuals who have problem dentures complain, are in discomfort, and are aggressive, tense, worried, and dissatisfied. They actively participate in regressive behaviour, transferring many of their worries and anxieties onto their mouth and face, and establishing a variety of vary with different in their dentist. Dermatoglyphics is the scientific study of epidermal crescent patterns and several researchers from different fields, such as biology, anthropology, genetics, and medicine, are engaged in unravelling several unknown aspects of this field.[46] In addition, dermatoglyphics has been used as a non-invasive diagnostic tool to detect or predict different medical conditions that have a fetal origin.[51]

The reason for the association between DGFs and health is the influence of epigenetics, which affects both.[52] The formation of the former begins in the first trimester of

pregnancy, during the 6th week, is completed after the 24th week of gestation and is formed according to the development and maturation of the central nervous system.[53]

Methods of Recording Dermatoglyphics patterns are usually recognizable by the naked eye. A simple magnifying lens, preferably with a light source, helps greatly in scanning Dermatoglyphics, especially in infants and small children, whose patterns are very fine. Permanent impressions or prints are necessary for quantitative analysis of Dermatoglyphics. [54,55]

Ink Method-

This is the most common way. Printer ink, a roller, a glass or metal inking slab, a sponge rubber, and high-quality paper, preferably with a somewhat glazed surface, are all required. It is not recommended for youngsters who are disobedient or have very fine ridges. The prints obtained by this method are not always of sufficiently good quality to allow accurate counting of ridges.

Inkless Method-

This method makes use of a commercially available patented solution and treated sensitized paper. It was described in detail by Walker. It is not popular currently. The method is suitable for printing hands or feet with well-demarcated dermal patterns. Transparent Adhesive Tape Method: The print is created using this procedure, which involves applying a dried colouring pigment to the skin and taking it off with transparent adhesive tape. Coloured chalk, dust, India ink, standard ink, carbon paper, graphite stick or powdered graphite, common oil pastel crayon, and so on can all be used as colouring agents. This approach is low-cost, quick, and simple to apply with a variety of patients.

Photographic Method-

The concepts of total internal reflection, which occurs when an item is forced against a prism, are used in this technique. A Polaroid camera is used to photograph the magnified image. It necessitates the use of relatively costly equipment. Even regular photographic methods have been tested recently.

1.Special Methods-

These methods are not widely used. They may, however, have some advantages that normal approaches do not, such as the ability to analyse the association between epidermal patterns and underlying bone structures, sweat pores, or the spatial shape of ridged skin patches, for example in primates (plastic mould method. Braganca and Pick devised a method that involves blackening the area to be investigated with graphite smeared on a piece of cardboard. The image is captured by the Tesa film, which is then adhered to a transparent film strip or photo printing foil. This kind of negative could be magnified five or six times. Mull has created a device that can take finger and palm prints without inking and can count ridge numbers between two prints instantly.

Integrated Automated Fingerprint Identification System (IAFIS) Scans fingerprints into a computer database, which transforms it into digital minutiae. This is then used to identify unknown prints with several possible matches. IAFIS does not make final verification of print identity, but rather flags prints with the closest correlation to the search prints. It allows criminal investigators to spend less time developing suspect lists and more time investigating suspects generated by the computer. The IAFIS maintains the largest biometric database in the world containing the fingerprints and corresponding criminal history information for more than 47 million subjects in the Criminal Master File. The fingerprints and corresponding criminal history information are submitted voluntarily by state, local, and federal law enforcement agencies. In the end, the final ID of the unknown to the known print is made.

Ultraviolet Imaging Systems-

Reflected Ultraviolet Imaging System locates prints on non-absorbent surfaces without chemical or powder treatment. When UV light strikes the fingerprint, light is reflected back to the viewer differentiating the print from its background surface. Chemical Methods for Visualizing Latent Prints

•Iodine fuming: Iodine is a solid crystal that when heated, turns into a vapor without passing through a liquid phase. This transformation is called Sublimation. Suspect material is placed in an enclosed cabinet with iodine crystals. Once heated, vapours fill the chamber and combine with latent print to make it visible. Iodine prints are not permanent and begin to fade once fuming is stopped. Can be fixed with 1% solution of

starch in water applied by spraying- this will turn blue and last for several weeks or longer.

•Super Glue fuming: works great on nonporous surfaces- metals, leather, and plastic bags. Created when superglue is placed on cotton and treated with sodium hydroxide. Created when heating- produces toxic vapours- cyanide Fumes and object contained within an enclosed chamber for up to 6 hrs. Produces white latent print.

LIVENESS DETECTION ON FINGERS [36]

The term Fake or artificial samples is used in reference to the biometric samples which are used to cheat the biometric systems. To overcome these new liveness detection methods were developed which are based on:

• Measurement of the pulse

• Variation of optical characteristics caused by pressure change

• Reaction of skin to illumination with different wavelengths

Though these methods have great applicability yet in presence of various skin disorders like psoriasis, Erythema Multiforme, systemic sclerosis, Raynauds phenomenon or cutaneous drug reaction etc, may influence detection process so much that alive finger could be classified as a non-living or artificial fake finger.

QUALITATIVE ANALYSIS OF DERMATOGLYPHIC PATTERNS [56,57,58]

Fingertip patterns: The ridge variations on the fingertips' proximal phalanges have been divided into three categories:

1. Loop
2. Whorl
3. Arch

Loop: On one side, a series of ridges enters the pattern area, turns back, and reappears on the opposite side. This pattern is found in 60% of the world's population. Loops are formed when one or more ridges enter from one side of the print, recur, and exit from the same side.

If the loop flows towards the little finger, it is called an ulnar loop; if it flows towards the thumb, it is called a radial loop. There is only one delta in each loop, and it is triangular in shape. Whorls: It is any ridge pattern with two or more triradii, one on the radial side and the other on the ulnar side of the pattern. It is found in 35% of the world's population. Have a few ridges that form spirals or circles. Will have two deltas.

2 TYPES OF WHORLS:

1. True Whorl (Wt)

• Concentric / Simple Whorl Ridges arranged in a Succession of concentric rings or ellipses

• Spiral Whorl Ridges spiral either in a clockwise or anticlockwise direction across the centre.

a) Concentric

b) Spiral

2. Composite Whorls (Wc)

A- Central pocket Whorl A pattern with a loop during which a smaller whorl can be found.

B- Lateral pocket or twin loop; It is composed of interlocking loop with two radii. Lateral pocket whorl can be classified as radial or ulnar based on the side which the ridges exit from the central core. In twin loop, both ridges open on either side of the core hence cannot be subdivided as radial or ulnar. Together these two patterns are known as double loop whorls.

C- Accidentals Complex patterns portray a mixture of multiple or more combinations, such as a loop and a whorl, triple loops, and other unusual patterns that cannot be categorised as being one of the above patterns. Arches: Simplest pattern found on fingertip. 5% of the world’s population has them A concave curvature is formed by successive and nearly parallel ridges that traverse the pattern region and establish a concave curve proximally. Arches- least common has 2 patterns plain arches and tented and it do not have deltas or cores.

Simple arch (A): The fingertip is made up of ridges that cross from one side somewhere else without recurving.

Tented arch (At): Ridges meet at a point interrupting the smooth sweep. This point of confluence is called a triradius because ridges usually branch out from this point in three different directions. The distal radiant of the triradius usually points vertically towards the apex of the fingertip and the ridges passing over this radiant are abruptly elevated and form a tent like pattern. People with arches are hardworking, capable, and common sensical and they do not procrastinate when it comes to getting the job done — they can be trusted to follow through their rules. In present study we have chosen "Dermatoglyphics" to assess patients' psychology because it gives results which will not change in any condition and results thus obtained will be without bias.

Till now no study have been conducted to assess complete denture patients' psychology through Dermatoglyphics. In the present study, 12 patients requiring complete denture were selected as subject and observations were subjected for statistical analysis. All male patients were selected with respect to age, education without any preformed idea about them.

The evaluation, analysis and interpretation were based on scientific studies and clinical experience. The qualitative analysis of finger pattern was done and different types of patterns (Arch, Loop, and Whorl) were noted on each subject. Personality and attitude of patient will determine the outcome of denture. This analysis will be helpful in treatment of patient and gives a prior idea to dentist to deal with the patient's expectations. All provided data is tabulated and statistically analysed for the outcome of satisfaction with the complete denture. Analysis of fingerprints so obtained revealed that among all subject's loops were the most frequent fingertip patterns followed by whorl and arches. Similar results were reported in previous study done by Sabrina Sachdev (2013)[37] who had studied Dermatoglyphics assessment in different dental Arch form. All the patients were subjected to psychometric Analysis and their personality was adjudged as philosophical, exacting, hysterical, indifferent. In our study, Analysis revealed that 58.4% patients were found to have philosophical personality, 8.3% had exacting personality, 8.3% had indifferent and rest 25% had hysterical personality. Subjects with stable personality have significantly higher incidence of loops as compare to whorls and arches. In subjects with dominant

personality, the frequency of occurrence of whorl was significantly higher than loops or arches. Arches were the least frequently appearing fingertip pattern in our study. Comparison of number of whorls among patient with different type of personality had done with Mann Whitney U test. Mean number of whorls present on finger was higher among dominant and compliant as compare to stable and influential. That was statistically significant. Comparison between personality type and difference in number of fingers with Arches done with Mann Whitney U test. Mean number of arches, present on fingers were higher among influential as compare to stable, Dominant and compliant trait. this was statistically significant.

This study demonstrate that a majority of philosophical personality patients had excellent level of satisfaction (66.6%), exacting personality had poor level of satisfaction (33.3%), majority of influential personality had excellent level of satisfaction (33.4%) and majority of hysterical personality had poor level of satisfaction (25%).

A comparison was done between dentures delivered by prosthodontists and non-prosthodontists based on nutrition status of patients, and a correlation was done between dermatoglyphics and nutrition status which was found to be positive.

Dermatoglyphics were widely used in medical and dental science and is useful tool for diagnosis and treatment plan. Assessment of complete denture patients' psychology, nutrition was first time done in this study. This method is authenticated, simple, economical and bias less. In our work, Fingerprints which don't change during entire lifetime is considered as a tool to judge attitude of patients towards their satisfaction related to complete denture treatment.

HYPOTHESIS

Hypothesis 1:

Null hypothesis -

There is no mean difference in the assessment of function, quality of life and psychometric analysis of patients before and after delivering of dentures made by prosthodontist and non-prosthodontist.

Alternate hypothesis-

There is mean difference in the assessment of function, quality of life and psychometric analysis of patients before and after delivering of dentures made by prosthodontist and non-prosthodontist

Hypothesis 2:

Null hypothesis-

There is no correlation between nutritional status and dermatoglyphics.

Alternate hypothesis-

A correlation exists between nutritional status and dermatoglyphics

LIMITATION

The present study is a cross sectional study hence it cannot determine the cause of the relationship between dermatoglyphics and nutrition. There are various factors that can affect the nutrition of an individual like dietary patterns, frequency and type of diet, socio economic status.

The sample size of the study is small; hence the result cannot be generalized.

RECOMMENDATION

•As the study is novel, there is a need to conduct more research on the subject, to know the relation between dermatoglyphics and denture adaptation through nutrition status.

•Studies with larger sample should be conducted so that the result can be generalized to the population.

•Both prosthodontist and non-prosthodontist can benefit from the technique in predicting the mental status and related outcome of the prosthodontic treatment of a person through their finger prints.

CONCLUSION

- The present study shows a corelation between denture adaptability and personality. It was observed that the dentures delivered by prosthodontist has better adaptability when compared to non- prosthodontist. This can be because of the post graduate curriculum.
- The study used mini-nutrition assessment to assess the nutritional status of the participants.
- Most of the participants who were malnourished had denture fabricated from non-prosthodontist. GOHAI was used to assess the oral health related quality of life.
- As the study was novel in its kind there was not much evidence found regarding the topic therefore, future research is needed in the field.

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Babu Banarasi Das University
Babu Banarasi Das College of Dental Sciences,
BBD City, Faizabad Road, Lucknow – 226028 (INDIA)

Dr. Lakshmi Bala
Professor and Head Biochemistry and
Member-Secretary, Institutional Ethics Committee

Communication of the Decision of the VIIth Institutional Ethics Sub-Committee

IEC Code: 01 **BBDCODS/01/2019**

Title of the Project: Assessment of Function, Quality of Life and Psychometric Analysis of Patients Before and After Delivering of Dentures Made by Under-Graduates and Post-Graduates.

Principal Investigator: Dr. Aishwarya Mehrotra **Department:** Prosthodontics and Crown & Bridge

Name and Address of the Institution: BBD College of Dental Sciences Lucknow.

Type of Submission: New, MDS Project Protocol

Dear Dr. Aishwarya Mehrotra,

The Institutional Ethics Sub-Committee meeting comprising following four members was held on 10th January 2019.

1.	Dr. Lakshmi Bala Member Secretary	Prof. and Head, Department of Biochemistry, BBDCODS, Lucknow
2.	Dr. Amrit Tandan Member	Prof. & Head, Department of Prosthodontics and Crown & Bridge, BBDCODS, Lucknow
3.	Dr. Rana Pratap Maurya Member	Reader, Department of Orthodontics & Dentofacial Orthopedics, BBDCODS, Lucknow
4.	Dr. Sumalatha M.N. Member	Reader, Department of Oral Medicine & Radiology, BBDCODS, Lucknow

The committee reviewed and discussed your submitted documents of the current MDS Project Protocol in the meeting.
The comments were communicated to PI thereafter it was revised.

Decisions: The committee approved the above protocol from ethics point of view.

Forwarded by:

Lakshmi Bala 21/01/19

(Dr. Lakshmi Bala)
Member-Secretary
IEC

Member-Secretary
Institutional Ethic Committee
BBD College of Dental Sciences
BBD University
Faizabad Road, Lucknow-226028

(Dr. B. Rajkumar)
Principal
BBDCODS

PRINCIPAL
Babu Banarasi Das College of Dental Sciences
(Babu Banarasi Das University)
BBD City, Faizabad Road, Lucknow-226028

BABU BANARASI DAS COLLEGE OF DENTAL SCIENCES (FACULTY OF BBD UNIVERSITY), LUCKNOW

INSTITUTIONAL RESEARCH COMMITTEE APPROVAL

The project titled **"Assessment of Function, Quality of Life and Psychometric Analysis of Patients Before and After Delivering of Dentures Made by Under-Graduates and Post-Graduates."** submitted by **Dr Aishwarya Mehrotra** Post graduate student from the **Department of Prosthodontics and Crown & Bridge** as part of MDS Curriculum for the academic year 2018-2021 with the accompanying proforma was reviewed by the Institutional Research Committee present on **26th November 2018** at BBDCODS.

The Committee has granted approval on the scientific content of the project. The proposal may now be reviewed by the Institutional Ethics Committee for granting ethical approval.

Prof. Vandana A Pant
Co-Chairperson

Prof. B. Rajkumar
Chairperson

ANNEXURES

Babu Banarasi Das College of Dental Sciences

(Babu Banarasi Das University)
BBD City, Faizabad Road, Lucknow – 227105 (INDIA)

Consent Form (English)

Title of the Study ……..

Study Number……..
Subject's Full Name…….
Date of Birth/Age ……
Address of the Subject……..
Phone no. and e-mail address……
Qualification ……
Occupation: Student / Self Employed / Service /
Housewife/ Other (Please tick as appropriate)
Annual income of the Subject……
Name and of the nominees(s) and his relation to the subject…… (For the purpose of compensation in case of trial related death).

1. I confirm that I have read and understood the Participant Information Document dated ……..for the above study and have had the opportunity to ask questions. **OR** I have been explained the nature of the study by the Investigator and had the opportunity to ask questions.
2. I understand that my participation in the study is voluntary and given with free will without any duress and that I am free to withdraw at any time, without giving any reason and without my medical care or legal rights being affected.
3. I understand that the sponsor of the project, others working on the Sponsor's behalf, the Ethics Committee and the regulatory authorities will not need my permission to look at my health records both in respect of the current study and any further research that may be conducted in relation to it, even if I withdraw from the trial. However, I understand that my Identity will not be revealed in any information released to third parties or published.
4. I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purpose(s).
5. I permit the use of stored sample (tooth/tissue/blood) for future research. **Yes [ ]** **No [ ]**

6. I agree to participate in the above study. I have been explained about the complications and side effects, if any, and have fully understood them. I have also read and understood the participant/volunteer's Information document given to me.

Representative:……..
Signatory's Name……. Date …….
Signature of the Investigator…… Date……..
Study Investigator's Name..... Date……..
Signature of the witness…… Date……..
Name of the witness……
Received a signed copy of the PID and duly filled consent form
Signature/thumb impression of the subject or legally Date…….

Acceptable representative

Babu Banarasi Das College of Dental Sciences
(Babu Banarasi Das University)
BBD City, Faizabad Road, Lucknow – 227105 (INDIA)

सहमति पत्र

अध्ययन शीर्षक.....
अध्ययन संख्या.....
प्रतिभागी के पूर्ण नाम.....
जन्म तिथि / आयु.....
प्रतिभागी का पता .....
फोन नं. और ई-मेल पता .....
योग्यता .....
व्यवसाय: छात्र / स्व कार्यरत / सेवा / ग्रहिणी .....
अन्य (उचित रुप मे टिक करें) .....
प्रतिभागी की वार्षिक आय .....
प्रत्याशीयो के नाम और प्रतिभागी से संबंध...(परीक्षण से संबंधित मौत के मामले मे मुआवजे के प्रयोजन के लिए)

1. मेरी पुष्टि है कि मैने अध्ययन हेतु सुचना पत्र दिनांक ..... को पढ व समझ लिया तथा मुझे प्रश्न पुछने या मुझे अध्ययन अन्वेषक ने सभी तथ्यों को समझा दिया है तथा मुझे प्रश्न पुछने के समान अवसर प्रदान किए गये।

2. मैंने यहॉ समझ लिया कि अध्ययन में मेरी भागीदारी पूर्णतः स्वैच्छिक है और किसी भी दबाव के बिना स्वतंत्र इच्छा के साथ दिया है किसी भी समय किसी भी कारण के बिना , मेरे इलाज या कानूनी अधिकारो को प्रभावित किए बिना , अध्ययन में भाग न लेने के लिए स्वतंत्र हुँ ।

3. मैंने यह समझ लिया है कि अध्ययन के प्रायोजक , प्रायोजक की तरफ से काम करने वाले लोग, आचार समिति और नियामक अधिकारियों को मेरे स्वास्थ्य रिकार्ड को वर्तमान अध्ययन या आगे के अध्ययन के सन्दर्भ देखने के लिए मेरी अनुमति की जरूरत नही है, चाहे मैने इस अध्ययन से नाम वापस ले लिया है। हॉलाकि मै यह समझता हुँ कि मेरी पहचान को किसी भी तीसरे पक्ष या प्रकाशित माध्यम में नही दी जायेगी।

4. मै इससे सहमत हूँ कि कोई भी डेटा या परिणाम जो इस अध्ययन से प्राप्त होता है उसका वैज्ञानिक उद्देश्य (ओं) के उपयोग के लिए मेरी तरफ से कोई प्रतिबंध नही है।
5. भविष्य के अनुसंधान के लिए भंडारित नमूना (ऊतक/रक्त) पर अध्ययन के लिए अपनी सहमति देता हुँ।

हॉ [ ] नही [ ] अनउपयुक्त [ ]

6. मै परीक्षण की अनुमति देता हुँ। मुझे इसके द्वारा यदि कोई परेशानी होती है, इसके बारे में जानकारी दे दी गई है। मैने रोगी जानकारी सूचना पत्र को पढ तथा समझ लिया है।

प्रतिभागी / कानूनी तौर पर स्वीकार्य प्रतिनिधि का हस्ताक्षर (या अंगूठे का निशान.....

हस्ताक्षरकर्ता का नाम..... दिनांक .....अन्वेषक के हस्ताक्षर ..... दिनांक .....

अध्ययन अन्वेषक का नाम .....

गवाह के हस्ताक्षर ..... दिनांक .....गवाह के नाम .....

मैनें पीआईडी और विधिवत भरे सहमति फार्म का एक हस्ताक्षर की नकल प्राप्त की.

प्रतिभागी कानूनी तौर पर प्रतिनिधि का हस्ताक्षर/ अंगूठे का निशान ..... दिनांक.....

Mini Nutritional Assessment
MNA®

Nestlé Nutrition Institute

Last name: First name:

Sex: Age: Weight, kg: Height, cm: Date:

Complete the screen by filling in the boxes with the appropriate numbers.
Add the numbers for the screen. If score is 11 or less, continue with the assessment to gain a Malnutrition Indicator Score

Screening

A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake ☐

B Weight loss during the last 3 months
0 = weight loss greater than 3kg (6.6lbs)
1 = does not know
2 = weight loss between 1 and 3kg (2.2 and 6.6 lbs)
3 = no weight loss ☐

C Mobility
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out ☐

D Has suffered psychological stress or acute disease in the past 3 months?
0 = yes 2 = no ☐

E Neuropsychological problems
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems ☐

F Body Mass Index (BMI) (weight in kg) / (height in m²)
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater ☐

Screening score (subtotal max. 14 points) ☐☐

12-14 points: Normal nutritional status
8-11 points: At risk of malnutrition
0-7 points: Malnourished

For a more in-depth assessment, continue with questions G-R

Assessment

G Lives independently (not in nursing home or hospital)
1 = yes 0 = no ☐

H Takes more than 3 prescription drugs per day
0 = yes 1 = no ☐

I Pressure sores or skin ulcers
0 = yes 1 = no ☐

J How many full meals does the patient eat daily?
0 = 1 meal
1 = 2 meals
2 = 3 meals ☐

K Selected consumption markers for protein intake
- At least one serving of dairy products (milk, cheese, yoghurt) per day yes ☐ no ☐
- Two or more servings of legumes or eggs per week yes ☐ no ☐
- Meat, fish or poultry every day yes ☐ no ☐

0.0 = if 0 or 1 yes
0.5 = if 2 yes
1.0 = if 3 yes ☐.☐

L Consumes two or more servings of fruit or vegetables per day?
0 = no 1 = yes ☐

M How much fluid (water, juice, coffee, tea, milk...) is consumed per day?
0.0 = less than 3 cups
0.5 = 3 to 5 cups
1.0 = more than 5 cups ☐.☐

N Mode of feeding
0 = unable to eat without assistance
1 = self-fed with some difficulty
2 = self-fed without any problem ☐

O Self view of nutritional status
0 = views self as being malnourished
1 = is uncertain of nutritional state
2 = views self as having no nutritional problem ☐

P In comparison with other people of the same age, how does the patient consider his / her health status?
0.0 = not as good
0.5 = does not know
1.0 = as good
2.0 = better ☐.☐

Q Mid-arm circumference (MAC) in cm
0.0 = MAC less than 21
0.5 = MAC 21 to 22
1.0 = MAC 22 or greater ☐.☐

R Calf circumference (CC) in cm
0 = CC less than 31
1 = CC 31 or greater ☐

Assessment (max. 16 points) ☐☐.☐
Screening score ☐☐.☐
Total Assessment (max. 30 points) ☐☐.☐

Malnutrition Indicator Score
24 to 30 points ☐ Normal nutritional status
17 to 23.5 points ☐ At risk of malnutrition
Less than 17 points ☐ Malnourished

References
1. Vellas B, Villars H, Abellan G, et al. Overview of the MNA® - Its History and Challenges. J Nutr Health Aging. 2006; 10:456-465.
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For more information: www.mna-elderly.com

Tools for statistical analysis:

Data was entered into Microsoft Excel spreadsheet and was checked for any discrepancies. Summarized data was presented using Tables and Graphs. The data was analysed by SPSS (21.0 version). Shapiro Wilk test was used to check which all variables were following normal distribution. Data was found to be normally distributed (p-value was more than 0.05). Therefore, bivariate analyses were performed using the parametric tests i.e. One way ANOVA (for comparing more than two groups) and Paired t test for comparing pre and post difference. Level of statistical significance was set at p-value less than 0.05

The following statistical formulas were used:

The Arithmetic Mean: The most widely used measure of central tendency is arithmetic mean, usually referred to simply as the mean. To obtain the mean, the individual observations were first added together and then divided by the number of observation. The operation of adding together or summation is denoted by the sign $\sum$.

The individual observation is denote by the sign X, number of observation denoted by n, and the mean by $\bar{X}$

$$\bar{X} = \frac{\sum_{i=1}^{n} X_i}{n}$$

The Standard Deviation: The standard deviation (SD) is the positive square root of the variance, and calculated as

$$SD = \sqrt{\frac{\sum X_i^2 - \frac{(\sum X_i)^2}{n}}{n-1}}$$

where, n= no. of observations and also denoted by subtracting minimum value from maximum value as below

Level of significance: "p" is level of significance signifies as below:

p> 0.05 Not significant (ns)

p <0.05 Just significant (*)

p <0.01 Moderate significant (**)

p <0.001 Highly significant (***)

Kruskal walis test

It is a non parametric test used for comparison of two or more groups

It is used in place of ANOVA, a parametric test

$$H = \left[\frac{12}{n(n+1)} \sum_{j=1}^{c} \frac{T_j^2}{n_j} \right] - 3(n+1)$$

n = sum of sample sizes for all samples, c = number of samples, Tj = sum of ranks in the jth sample, nj = size of the jth sample.

Pearson coefficient correlation

It is used to evaluate the relation between two quantitative variables

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[\, n\Sigma x^2 - (\Sigma x)^2 \,][\, n\Sigma y^2 - (\Sigma y)^2 \,]}}$$

r = correlation coefficient

x_{i} = values of the x-variable in a sample

\bar{x} = mean of the values of the x-variable

y_{i} = values of the y-variable in a sample

\bar{y} = mean of the values of the y-variable

Spearmans correlation

It is used to check the relation between quantitaive and qualitative variable

$$r_s = 1 - \frac{6\sum D^2}{n\left(n^2 - 1\right)}$$

The significance level is the probability of rejecting the null hypothesis when it is true. For example, a significance level of 0.05 indicates a 5% risk of concluding that a difference exists when there is no actual difference. Lower significance levels indicate that you require stronger evidence before you will reject the null hypothesis.

ANNEXURES

Curiginal

Document Information

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Sources included in the report

W	URL: http://www.ijocrweb.com/pdf/2015/April-June/9317_Review%20Paper.pdf Fetched: 6/28/2021 12:47:00 PM	4
W	URL: https://www.ijmi.in/article-download/full-text/1375 Fetched: 6/28/2021 12:47:00 PM	2
SA	Dr.John Wilfred Thesis.docx Document Dr.John Wilfred Thesis.docx (D46335827)	1
SA	final full.docx Document final full.docx (D42154644)	1
SA	Final revised Block 5 Unit 1 IGNOU.doc Document Final revised Block 5 Unit 1 IGNOU.doc (D90053170)	2
SA	I Block 5 Unit 1.doc Document I Block 5 Unit 1.doc (D86038409)	1

Entire Document

INTRODUCTION The value of dentitions in the adult population cannot be overstated. Reduced masticatory performance due to teeth loss may be a significant age-related cause that raises the risk of malnutrition and diseases.1 The correlation between tooth loss and dietary intake has been found to be extremely significant masticatory capacity is decreased as a result of tooth loss,

Amrit Tandan (Guide)

Aishwarya Mahajan