Master of Science in Public Health

Impact of Dental Health on the Daily Living of Geriatric Population Visiting Dental Hospitals of Rawalpindi.

MSPH THESIS

by

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(2021-2023)

Impact of Dental Health on the Daily Living of Geriatric Population Visiting Dental Hospitals of Rawalpindi.

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(362889-PIO/MSPH-2021)

Dissertation submitted in partial fulfillment of the requirement for the degree of:

MASTER OF SCIENCE IN PUBLIC HEALTH
(2021-2023)

To

Al-Shifa School of Public Health, PIO, Al-Shifa Trust Eye Hospital,
Faculty of Medicine
Quaid-e-Azam University,
Islamabad

Word Count: 15602

DECLARATION

I, Saadia Ayub, hereby state that my thesis titled "Impact of Dental Health on the Daily Living of Geriatric Population Visiting Dental Hospitals of Rawalpindi" submitted to the Department of Public Health, Faculty of Medicine, Al-Shifa School of Public Health, Quaid-e-Azam University Islamabad, Pakistan for the award of the degree of Master of Science in Public Health is the result of research work carried out by me. I certify that I have read and understood the rules and regulations of DPH and QAU regarding assessment procedures and offenses and formally declare that all work contained within this document is my own apart from properly referenced quotations.

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Dedicated To My Children

Ayerah Tahir

And

Ibrahim Tahir

Acknowledgments

All the thanks and praise be to Allah Almighty who enabled me to complete this task. It is with great privilege, I express my most humble and profound gratitude to my supervisor **Dr. Saman Waqar** for her guidance, supervision, valuable suggestions, and constant encouragement throughout the study which facilitated the completion of this thesis. Her guidance has empowered me to take the next strides towards my career goals. She made me realize that there is no substitution for hard work.

I am thankful to the team of Al-Shifa School of Public Health for all the support during my educational journey. I am extremely grateful to my esteemed teachers **Dr. Ayesha Babar, Prof. Dr.Umm-e-Sughra, Sir Khizer Nabeel, Dr. Ahmed Abdullah, Dr. Qurat-ul-Ain and Miss Qandeel**, for providing me with the necessary support and encouragement to pursue my professional aspirations.

I would like to thank **Prof. Dr. Amjad**, Principal, Margalla Institute of Health Sciences Rawalpindi for providing me with the opportunity to conduct my research and for all of the resources and support.

I express profound gratitude to my family for the immense love and unwavering support they have shown me throughout this journey. Their constant encouragement and motivation have been instrumental in my successful completion of this project.

Saadia Ayub

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LIST OF ABBREVIATIONS

ADL	Activities of Daily Living
BMI	Body Mass Index
CDC	Centers for Disease Control and Prevention
CPI index	Community Periodontal Index
DIDL	Dental Impact on Daily Living
DMFT	decayed (D), Missing (M), filled (F) teeth
FDI	World Dental Federation
OHIP	Oral Health Impact Profile questionnaire (OHIP-14)
OHI-S index	Oral Hygiene Index-Simplified
OHRQoL	Oral Health-related Quality of Life
ROAG	Revised Oral Assessment Guide
SDG	Sustainable Developmental Goals
WHO	World Health Organization

ABSTRACT

Objectives:

- To assess the impact of dental health on the daily living of geriatric population.
- To determine the factors that influence the relationship between dental health and daily living of geriatric population.

Methodology:

A Descriptive Cross-Sectional study was carried out during a period of six months at public and private dental hospitals of Rawalpindi. Participants of age 60 years and above, both male and female were selected. Calculated sample size was 281. By using simple random sampling technique, one dental hospital was selected. Desired sample from that dental hospital was collected using non-probability consecutive sampling strategy. Data was collected about socio-demographic characteristics and DMFT index. Adapted validated tool dental impact on daily living (DIDL) was used to assess the impact of dental health on daily living.

Results:

Results of Chi-Square test of association showed a positive association between the dental impact on daily living (DIDL) and sociodemographic variables including Age (p-value=0.001), Gender (p-value=0.001), Education (p-value=0.001), Income(p-value=0.001), occupation(p-value=0.029), marital status(p-value=0.001), living arrangement (p-value=0.001), and history of chronic illness (p-value=0.001). The results of association between the DMFT index and dental impact on daily living (DIDL) also showed statistically significant results (p-Value=0.001). Binary Logistic Regression Analysis indicated gender [OR= 6.98, p-value=0.005] and dental health of the individual obtained using decayed, missing, filled teeth [OR= 6.43, p-value=0.001] are the strongest predictors of the level of impact experienced in daily life activities.

The overall model was statistically significant [X^2=51.24, p-value=0.001] and the variables were responsible for 32.4% of the variance in the outcome variable.

Conclusion:

This study highlighted the effect of age, gender, income, education, marital status and the dental health condition on the daily lives of geriatric population. The significance of oral hygiene and preventive care influence daily lives. The findings emphasize the need of targeted interventions and support to mitigate the impact of dental health issues on overall quality of life.

Keywords:

Dental health, daily living, Oral health related quality of life, Decayed missing filled teeth, Geriatric population.

Chapter 1

INTRODUCTION

Chapter 1: Introduction

World Health Organization in 1948 stated health as “complete physical, mental, and social well-being and not merely the absence of disease or infirmity”, despite the definition of health by WHO, universal health has routinely been considered a unidimensional concept with focus on disease identification and treatment. Oral health refers to the overall health of the mouth, teeth, gums and entire orofacial system (Huang and Chang 2022). According to World Dental Federation, Oral health is multidimensional that includes not only the health of teeth and gums but also encompasses the ability to speak, smile, smell, taste, swallow, show emotions through facial expressions without any pain, discomfort or medical condition related to craniofacial complex (Lee et al. 2017). It is part of an individual's general health and well-being, with dental caries and periodontitis being the most prevalent condition affecting dental health worldwide (Peres et al. 2019). Good dental health is important for maintaining healthy teeth, preventing dental problems such as dental caries and tooth decay, and promoting the overall health and well-being of an individual. Unfortunately, oral health is not explicitly targeted in the development agenda for Sustainable Developmental Goal SDG3. According to a popular Chinese saying “The illness comes from the mouth”, emphasizes the critical role of dental health in the overall well-being of an individual.so, The authors in a study suggested that oral health should be considered as the initial step towards achieving SG3 (Huang & Chang, 2022b). So, oral health is not just limited to dental epidemiology focused on teeth. It has a significant impact on systemic health conditions. The interplay between oral health, overall health, and well-being cannot be disregarded. It is crucial to raise global awareness about oral health care, promotion, and universal coverage in dentistry and related oral sciences. Good oral health is not only beneficial for teeth, but also for the

general health and well-being of the entire body. In conclusion, oral health is a fundamental aspect of good health and well-being, and a crucial first step towards achieving SDG 3.

With the change of the medical model to a social model in the health care system, the traditional biomedical endpoints of clinical studies have been extended to include patient-centered measurements, such as quality of life (Liu et al., 2021). Dental health is part of general health and is recognized as a vital component of quality of life (Spanemberg et al. 2019). According to Inglehart and Bagramian, quality of life for oral health (OHRQoL) is assessed when factors are focused on oral and facial problems (Inglehart et al., 2002). Quality of life addresses the indicator variables and determinants with subjective and an objection approach. OHRQoL is a multi-dimensional concept which includes a subjective assessment of oral health, functional well-being, emotional well-being, expectations and satisfaction with care and self-worth (Sischo and Broder 2011) . The dental impact on daily living (DIDL) scale emerges as a promising measure to evaluate oral health-related quality of life (OHRQoL). This socio-dental scale encompasses five dimensions that assess various aspects of an individual`s well-being (Ganesh et al., 2013). The objective approach focuses on measurable external life conditions like family income, educational level, and access to healthcare facilities. The subjective approach focuses on patient`s self-evaluation of life conditions like the extent of the problem, satisfaction, happiness, sorrow (Matza et al., 2004). Despite its relatively recent emergence in recent decades, quality of life linked to oral health (OHRQoL) has significant implications for the clinical practice of dentistry and dental research. The goal of health is to provide complete coverage of health-related subjects and analyze patterns in factors that impact health such as healthcare usage, healthcare resources, health expenses and healthcare

providers. Additionally, it aims to explore the determinants of health and assess changes in health status over time (National Center for Health Statistics (US), 2023).

Aging is a naturally occurring process and one must consider old age as a natural and unavoidable biological phenomenon. Although some older people have physical and psychological problems which need special attention, we cannot assume that all seniors share these conditions. Noncommunicable diseases are rapidly becoming the principal causes of disability and mortality in old age. The oral health of an individual is related to the individual`s overall physical well-being and quality of life and this measure assesses people's oral health and the influence of the dental condition on aspects of people`s daily activity (Almutairi, Scambler, and Bernabé 2023). Measures of oral quality of life should take into account the underlying morbid process, dental functional status, lifestyle, oral health practices, and the person's competing priorities in everyday life (Sheiham 2005). Chronic conditions and most dental conditions share common risk factors. The geriatric population faces several challenges as they age, and one of the most important factors affecting their daily living is oral health. Despite the Affordable Care Act introducing measures to improve access to preventive health services, it did not extend coverage for oral health prevention in older age individuals (de Sam Lazaro et al., 2023). Studies around the world have utilized various methods to explore the prevalence of dental caries and various factors influencing it. The most important risk factors mentioned for tooth decay were age, gender, educational status, oral hygiene measures, oral health literacy and economic conditions of the individual (Moradi et al. 2019) .

The oral health of the geriatric population is often associated with functional limitations, which can impact their ability to perform daily activities. This can be due to pain or discomfort, difficulty eating or speaking, or other factors related to poor oral

health. For years, oral health was determined only by the clinic, which did not permit an assessment of the real impact of oral disease on the daily lives of patients. The concept of "dental health and associated functional limitation" includes four categories: functional factors, psychological factors, social factors, and the presence of discomfort or pain. Problems caused by dental health in people's lives include problems with chewing, lower dietary intake with consequent weight loss, insomnia, irritability, and low self-esteem (Sood et al. 2014). In older adults, compromised dental health can lead to a decline in overall health, and difficulty to obtain adequate nutrition and maintaining good oral hygiene which can lead to additional problems and further reduce the overall quality of life. Functional limitations such as difficulty eating, speaking, smiling, and chewing and their psychosocial effects can affect a person`s life satisfaction as well as daily living.

Oral Health-Related Quality of Life is a diverse construct including personal assessment of the patient's dental health, physical health, psychological well-being, social well-being, expectations, and satisfaction, self-worth that is considered in the survey and medical research on a macroscale and forms an important part of overall health and well-being which was recognized by the World Health Organization (WHO) as an integral component of the Global Oral Health Program since 2003 (Sischo and Broder 2011) .

The negative impact of poor oral health on the quality of life of older people is an important public health issue that needs to be addressed by decision-makers. In the coming decades, health policy decision-makers will face huge challenges due to the rapidly changing burden of chronic disease on the elderly. The population aged 60 years and above was 7% in 2022, showing a growth in the average annual rate of 0.51%. There is only one dental surgeon for every 42,000 people in the country's urban areas

(Khan, Manohar, and Bilal 2012). Pakistan is a developing country, having multiple challenges. So, a rise in the ratio of aged people and their declining health pose a burden on the healthcare system. This research will focus on the impact of dental health on the daily living of old age individuals. Dental health status of children and older age individuals has been well-studied in many countries as they are high risk groups for tooth decay (Moradi et al. 2019).In developing countries dental caries have been a major problem for adult population (Namal et al., 2008), very limited research has been carried out to measure dental health status and its impact on daily activities of old age individuals. It is therefore important to study this complex and multi-faceted issue that has far-reaching implications for the overall health and well-being of an individual and to address and recognize these issues to improve the daily living of older adults.

Oral health disparities are becoming more profound and are influenced by various social, political, and economic factors. It is crucial for countries to invest more financial resources towards improving healthcare systems and promoting healthy lifestyles. Additionally, adopting a patient-centered approach to oral care that addresses the impact of social, economic, physical, and mental factors is necessary to enhance oral health and overall well-being. There is also a significant need for the development of the healthcare workforce in terms of quality education and training worldwide. Under the competency of narrative medicine, primary care workers can focus more on eliminating oral health inequities in vulnerable groups (Listl et al. 2015) . Social determinants can significantly affect oral health. Oral diseases are more prevalent among poorer and marginalized populations (Marmot and Bell 2011). It is imperative to reduce oral health inequities and strengthen oral health services for universal health coverage (Huang and Chang 2022) . Decision-makers must prioritize essential healthcare, including oral care services. Routine oral health examinations should be

integrated into conventional physical examinations. Cost-effective approaches to delivering oral care services for all include promoting sugar-free products, fluoridation, providing oral hygiene instruction, and offering dental prophylaxis so that the daily living of the population can be improved.

1.1 Rationale:

With increasing advancement in medical science, life expectancy of individuals of Pakistan in 2022 was 67.64 years, an increase of 0.23% from 2021.According to population pyramid of Pakistan, population aged 60 years and above was 7% in 2022, showing a growth in average annual rate of 0.51%. There is only one dental surgeon for every 42,000 people in the country's urban areas. Pakistan is a developing country, having multiple challenges. So, a rise in the ratio of aged people and their declining health pose a burden on healthcare system. This research will focus on the impact of Oral health associated functional limitations on daily living of old age individuals. Although this has been well-studied in many countries, but very limited research is carried out in Pakistan in the field of oral health and geriatrics.

In older adults, Compromised Oral health can lead to a decline in overall health, difficult to obtain adequate nutrition and maintain good oral hygiene which can lead to additional problems and further reduce the overall quality of life. Functional limitations such as difficulty eating, speaking, smiling, chewing and its psychosocial effects can affect a person`s life satisfaction as well as daily living. It is therefore important to study this complex and multi-faceted issue that has far reaching implications for the overall health and well-being of an individual and to address and recognize these issues to improve the daily living of older adults.

1.2 Objectives:

- To determine the frequency of dental health and associated functional limitation in geriatric population visiting dental hospitals of Rawalpindi.
- To assess the impact of dental health on the daily lives of geriatric population.
- To determine the factors that influence the relationship between dental health and daily living of geriatric population.

Chapter 2

LITERATURE REVIEW

Chapter 2: Literature Review

2.1 Background:

The concept of quality of life is intricate and multidimensional, encompassing various mental and physical aspects of life. It is subjective and individualistic perception that reflects a person`s beliefs, emotions, and overall well-being (Azami-Aghdash et al. 2021).Over the past few decades, dental health has emerged as an important aspect of person`s health and well-being with important implications in dental research and field of clinical and preventive dentistry. Dental health related quality of life is a multidimensional concept that focuses on physical, psychological, emotional, spiritual and social aspects of a person`s daily living (Sischo and Broder 2011).

2.2 Aging and dental health:

Aging, a complex phenomenon, is often associated with the development of chronic illnesses that can lead to physical and cognitive decline as well as frailty and limited mobility. One of the primary concerns among older individuals is maintaining good general health and proper nutrition to support overall well-being. Older individuals are more susceptible to various complications, particularly chronic diseases, oral and dental disorders are among the most common issues and complaints in this demographic group (Karki, Monaghan, and Morgan 2015).Declined dental health in elderly individuals is mainly represented in increased rate of tooth loss , tooth decay or dental caries ,periodontal diseases ,dry mouth also known as xerostomia and other conditions resulting from maintaining poor dental hygiene. The impact of disability on dental health care is significant, particularly when it comes to treating functionally dependent elders. They face challenges with performing dental hygiene on their own and often

require multiple medications, which can create an environment in the mouth that leads to quick tooth decay (Hoogendijk et al. 2019).

2.3 Oral diseases and impact on daily living:

Oral diseases are often an unnoticed problem that has a greater impact on the lives of older adults. Dental caries and periodontal diseases are the most prevalent chronic conditions and pose a greater risk to dental health, ultimately leading to tooth loss (Benjamin 2010).Tooth loss has the potential to impact their functional dependence ,particularly in relation to maintaining proper nutrition. The World Health Organization (WHO) recommends a minimum of 20 teeth for adequate oral function and nutrition(WHO Expert Committee on Recent Advances in Oral Health and Organization 1992)

2.4 Global statistics of geriatric population and their dental health:

Globally, there are currently about 750 million people aged 65 and above. Poor oral health amongst geriatric population worldwide was particularly evident in the elevated rates of tooth loss, dental caries experience, and the prevalence rates of periodontal disease, xerostomia, and oral precancer/cancer. Evidence from the literature indicates that up to 78% of older adults suffer from edentulism, which can affect the health of other organs (Janto et al. 2022). According to the Centers for Disease Control and Prevention, 25% of people aged 65 and over are toothless. Almost one-third of elders experience untreated dental caries. Severe gum disease is associated with chronic diseases and serious health issues such as diabetes, heart disease, stroke and respiratory disease. Around 68% of older adults in the United States are affected by preventable and reversible conditions such as tooth decay and periodontal diseases.

2.5 Geriatric population of Pakistan:

In Pakistan, with a population of over 235 million people, the sixth most populous country in the world according to official statistics, people older than 60 years constitute 7% (14 million) of the total population. It is a country of extremely diverse environmental, geographic, ethnic, social, religious, and cultural demography. A vast majority of the population of the agriculture-based economy of Pakistan still lives in rural areas (Niaz et al. 2013). During the second half of the 20th century, the age composition of the population changed dramatically, with an increasing number of the aging population (Razak et al. n.d.). With increasing advancement in medical science, the life expectancy of individuals in Pakistan in 2022 was 67.64 years, an increase of 0.23% from 2021. According to the population pyramid of Pakistan, the population aged 60 years and above was 7% in 2022, showing a growth in the average annual rate of 0.51%. According to World Health Organization, 1 in 6 people in the world will be aged 60 years or over by the year 2030 (The World Health Organization (WHO) Approach to Healthy Ageing - PMC, n.d.). The proportion of the world's elderly continues to rise, particularly in developing countries (Petersen et al. 2005).

2.6 Various Studies on Dental Health:

2.6.1 Dental Health of Elderly Population:

A cross sectional study was carried out in 2010, Peshawar Pakistan by Alam et al, to investigate the nutritional and oral health status of the elderly and assessed the relationship between oral health, teeth cleaning and nutritional status. Dental health of every subject was examined by a dental physician and decayed (D), Missing (M), filled (F) teeth were recorded. Patient self-assessment form for bleeding gums and chewing problems was also developed. Based on BMI values, subjects were divided into two

groups, underweight and normal weight group. It was recorded that there was significant difference (p=0.001) in DMFT scores of the two groups. Underweight elderly subjects presented with chewing problems and bleeding gums. Inverse correlation between BMI and DMFT score (r=0.211, p=0.001) was reported. Those who cleaned their teeth regularly, two times a day, had relatively healthier oral health as compared to those who seldom clean their teeth (Alam and Bangash 2010).

2.6.2 Impact of Oral health related Quality of Life:

A cross-sectional study by Kotzer at al in 2012 was conducted on lives of pre-seniors and seniors living in Nova Scotia, Canada, involving 1461 participants aged 45 to more than 65 years to describe the impact of Oral health related quality of life (OHRQoL). Oral Health Impact Profile questionnaire (OHIP-14) was used to measure the oral health related quality of life. The results of logistic regression analysis showed that individuals in rural areas had about twice the likelihood of reporting an impact 'very often" among the community dwelling sample. Individuals with a high school education or lower were 2.3 times more likely to report an impact. One in four seniors reported Oral health related quality of life impact "fairly/very often". Most commonly reported dimensions were "physical pain "and psychological discomfort". Results showed that 12.2% participants residing in long term care facility found it difficult to eat any foods as compared to 7.7% participants residing in the community and 11.6% of long-term care facility residents reported being self-conscious 'very often' in comparison to 8.2% residing in the community. Pre-seniors residing in the community reported significantly more impact (28.8%) but there was no significant difference in oral health related quality of life between seniors (25.3%) and pre-seniors (21.2%) residing in long term care facility. This research has shown that the dental health and

its related quality of life are insignificant among pre-seniors and seniors residing in long term care facility while those residing in community showed greater prevalence of dental issues (Kotzer et al. 2012).

2.6.3 Studies on dental health and daily life activities:

2.6.3.1 Subjective dental issues and their influence on the daily lives:

Oral conditions go beyond their physical effects and have substantial social consequences that impact multiple aspects of everyday life. Several studies have focused on evaluating the social influence of illnesses by examining the limitations they place on individual`s daily activities. Through the conduct of such studies, researchers acquire valuable understanding regarding the wider implications of oral health problems on an individual`s overall well-being and their capacity to effectively participate in society. A household cross-sectional survey was conducted in India (C. V. Deepan Kumar et al. 2015) to evaluate the to evaluate the reliability of the Dental Impact on Daily Living (DIDL) tool in assessing subjective dental issues and their influence on the day-to-day lives of the Indian tribes. DIDL tool, developed by Leao and Sheiham, was translated into Malayalam language and the data was collected. Additional clinical indexes used in the study included DMFT for evaluating caries history. CPI index for assessing periodontal status, and OHI-S index for evaluating the oral hygiene status of the population. To establish a correlation between subjective observations of dental impact and the tool`s validity, the community periodontal indices index was employed. Data analysis was performed using spearman`s correlation. Sample size was 250 with 37.6% participants of age 50 and above and 64% of them were females. The majority of individuals exhibited a suboptimal clinical oral health status, while their perceived impact on daily life was reported as satisfactory. The

findings indicated that the validity of the DIDL tool in relation to the participant`s clinical status and its relevance to their social status was weak. The validity between the DIDL tool and the oral health status of individuals from a low socioeconomic status was found to be insignificant and weak. This variation may be attributed to the fact that individuals from different social classes hold diverse perspectives regarding what is most significant in their lives. Thus, dental problems can be overlooked at the individual level based on personal priorities (C V Deepan Kumar et al. 2015).

2.6.3.2 Impact of dental health on daily life activities:

A population based cross sectional study was conducted in 2016 by Alvis da silva et al to analyze the relationship between dental health status and functional capacity in performing activities of daily living of elderly population residing in Japan. Total 441 Participants of both genders aged 60 years and above were included in the study. Intraoral examination was conducted and assessments were made of the extent of tooth decay using the CPO-D index, the condition of the gums using the CPI and PIP indexes, the necessity and usage of dental prosthesis, and the existence of any oral lesions. Functional capacity was evaluated by assessing the independence in activities of daily living. Structured questionnaire was used to survey the socioeconomic and demographic characteristics. After conducting factor analysis on the variables related to oral health, four indicators were identified. No association between these indicators and the functional capacity of the elderly were reported. The oral health indicators were found to be significantly correlated with various factors, such as gender, age, presence of a caregiver, primary place of residence, duration since last dental check-up, type of treatment sought during the visit, and personal perception about the need for replacement of dental prostheses. It was suggested that the dependence in the elderly may arise at a different time than when the effects of oral issues become apparent, as

the cumulative effects of prior invasive dental treatments may also play a role. Since the impact of functional capacity on oral health of elderly was not determined, it is important to take into account the timing of the events that were examined (Silva et al. 2016).

2.6.3.3 Functional dependence in activities of daily life:

A Quantitative, analytical, cross-sectional research with 280 people aged ≥ 60 in Brazil was conducted by Saintrain et al in 2018 to assess the relationship between Activities of daily life and oral health status in older adults. Data was collected about sociodemographic situation, oral discomfort, general health using community oral health indicator and activities of daily life scale. Results showed that there was significant difference in functional dependence between age groups ($p<0.001$), incomes ($p=0.034$), and levels of education ($p=0.003$).Functional dependence was reported to be more likely in individuals who have experienced tooth loss ((OR = 2.13; $p = 0.025$), difficulty in chewing and swallowing food(OR = 2.56; $p = 0.003$),have problems with taste of food (OR = 2.06; $p = 0.044$),rate their general health as poor (OR = 3.7; $p = 0.001$),have speech problems (OR = 3.15; $p = 0.002$).Dependent individuals reported increased potential for caries ($p=0.013$) and remained associated with dependence in activities of daily life in logistic regression model. Thereby concluding that oral health status of older individuals can be affected by functional dependence in activities of daily living (Saintrain et al. 2018).

2.6.4 Oral health related Quality of life and its associated factors:

A cross-sectional study was conducted in 2020 by Koistinen et al to describe and analyze the oral health related Quality of life among older people in short-term care and

its associated factors. The author stated that oral health is associated with individuals' well-being and the way of living as it includes the ability to smile, speak, chew, swallow and express emotions by facial expressions with any pain or discomfort. As individuals grow older, they may experience a decline in abilities such as vision, mobility, cognition, and functioning in activities of daily living (ADL), which can make maintaining good dental hygiene more difficult, consequently, older people who require care may have inadequate dental health and require assistance with their daily oral care routine. Traditionally, the evaluation and measurement of oral health have focused solely on the biomedical perspective. However, taking a holistic approach to oral health assessment is essential since an individual may have clinical signs of caries or periodontal disease despite experiencing good oral health and vice versa. So, to assess oral health, it was crucial to consider both objective measures such as clinical evaluation and subjective measures such as self-rated experiences. Individuals receiving end-of-life care were not included in this study. Out of 931 individuals who were evaluated for eligibility ,477 of them, which accounts for 51% did not fulfill the eligibility criteria. Data was collected from 391 old age individuals by clinical dental assessments, questions were asked regarding perceived oral and general health, Katz index of daily living (Katz-ADL) and the Revised Oral Assessment Guide (ROAG). The Oral Health Related Quality of Life was evaluated using the Oral Health Impact Profile (OHIP-14). To analyze the data, Multivariate logistic regression models were used. The study included 209 (53%) females and 182 (47%) males. Of these, 214 (55%) were 65-84 years old and 177 (45%) were 85-100 years old (mean age = 82.9). Poor Oral health related quality of life was reported by 34% of the study participants. Associated factors reported were female gender, swallowing problems, poor self-perceived physical and oral health. The results of the study indicated a significant association between self-

perceived health among old age individuals and the Oral health related quality of life (Koistinen et al. 2020).

2.6.5 Perceived and Clinical Oral Health Status:

A cross-sectional study was conducted from in 2022, in ten dental hospitals of Pakistan by Fahim et al to explore the association of perceived oral health status (PSR-OHS) with clinically determined Oral health status and to identify demographic, socio-economic, and clinical factors that influence perceived oral health status. Single stage cluster sampling was done and Participants were divided into three age groups: young adults (15–29 years), adults (30–54 years) and older adults (55–70 years of age). Participants were assessed using a structured pre-validated tool having subjective and objective determinants, including gender, education, and family income, household income, dental visits, and type of health facility visited. Oral health status was measured using DMFT index. Periodontal health was measured using periodontal index. One-way ANOVA test was used to analyze patient`s demographic distribution with perceived oral health status and oral functions. Two tailed complex linear model was used to determine association with clinical oral health and perceived oral health status. Results showed significant gender difference of perceived oral health status in young adults and adults, where females reported higher rate of poor self-perception. However, no significant gender difference was reported in older adults. Rate of poor self-perception decreased with higher education, more income and a greater number of preventive dental visits. Individuals with more DMFT score had poorer perceived oral health status than their colleagues (Fahim et al. 2022).

2.7 Conceptual Framework:

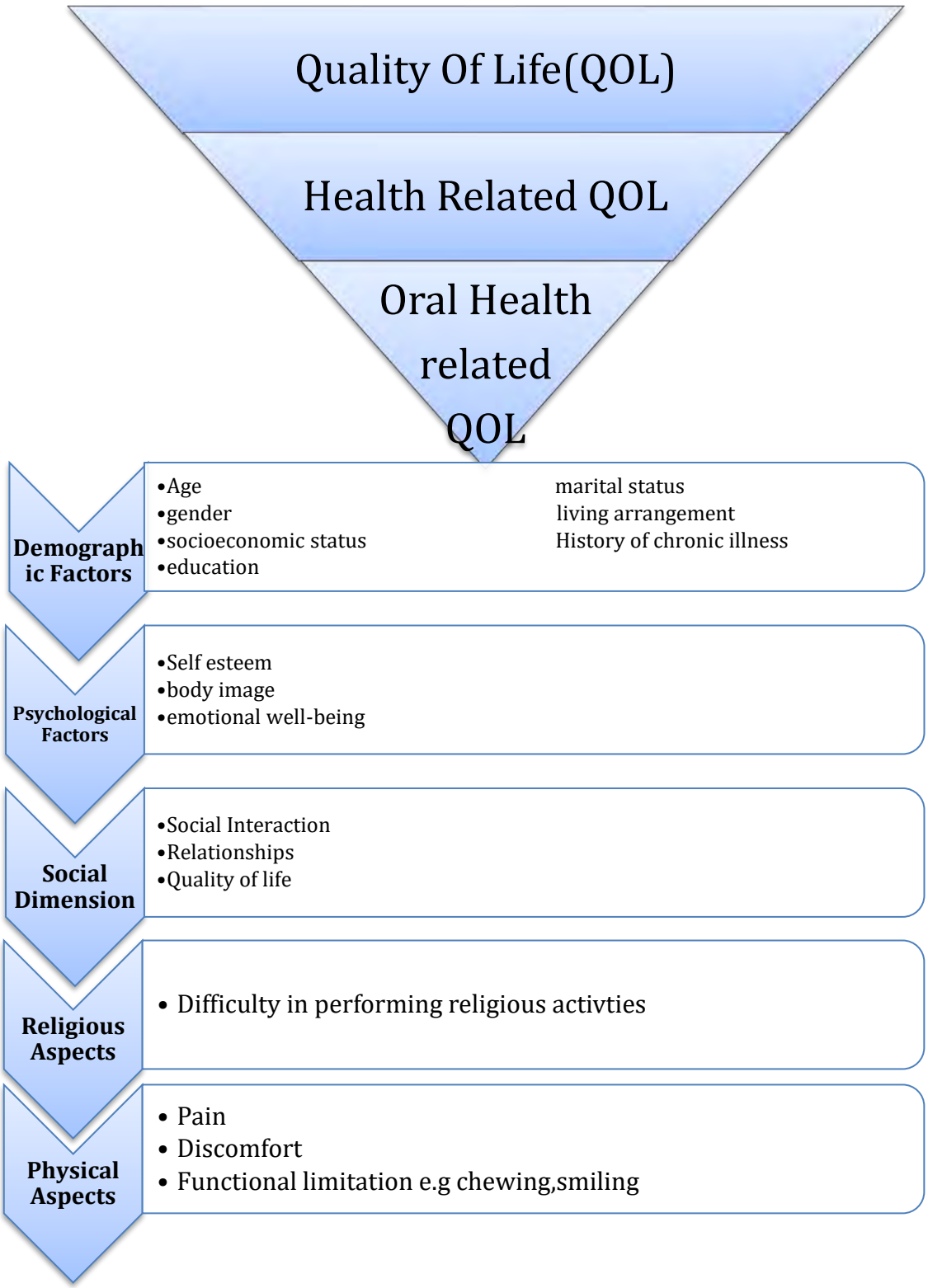

Figure 1: Conceptual Framework of Dental Impact on Daily Living

2.8 Hypothesis:

2.8.1 Null hypothesis:

There is no significant impact of dental health on daily living of geriatric population visiting dental hospitals of Rawalpindi.

2.8.2 Alternate hypothesis:

There is a significant impact of dental health on daily living of geriatric population visiting dental hospitals of Rawalpindi.

2.9 Operational definitions:

2.9.1 Dental Health:

Dental health refers to the health and well-being of the teeth. Good oral health is important for maintaining healthy teeth and gums, preventing dental problems such as tooth decay and gum diseases, and promoting overall health and well-being.

The Decayed, Missing, Filled Teeth (DMFT) index is used to measure the prevalence of dental caries and tooth decay in a population. It is a numerical score that calculates the number of teeth that are decayed(D), missing (M), filled(F) due to caries. The DMFT index is calculated by counting the number of teeth that fall into each category and adding up the scores.

2.9.2 Functional limitation:

Oral health associated functional limitation refers to the negative impact that poor oral health can have on a person`s ability to perform everyday tasks such as eating, speaking, and socializing. When a person encounters missing teeth, tooth decay, or gum disease, it can affect their overall well-being and quality of life. These problems can lead to pain

and discomfort, difficulty eating and speaking and even feelings of embarrassment or self-consciousness. Some older adults can maintain their independence and function well, while others may require support and assistance with daily activities.

2.9.3 Daily living:

Daily living refers to the routine activities and tasks performed by an individual on regular basis to take care of themselves and their households. These activities may include personal hygiene, grooming, preparing and consuming meals, household chores, commuting to work, interacting with others, and engaging in leisure activities. Daily living tasks may vary depending on an individual`s age, health status, cultural background and living situation.

Dental impact on Daily Living (DIDL) tool is used to measure the extent to which dental problems interfere with an individual's ability to perform daily activities such as eating, speaking, and socializing. The scoring is done using 4-point Likert scale, which assigns a value to each response ranging from 0 (no impact on daily living) to 3(severe impact).

2.9.4 Geriatric population:

According to World Health Organization, a person aged 65 years, or more is referred to as "elderly". However, life expectancy of individuals in Pakistan is 67.64 years. So, in this study, group of people who are 60 years of age or older are taken as geriatric population.

Chapter 3

METHODOLOGY

Chapter 3: Methodology

3.1 Study Design:

This is a Descriptive Cross Sectional Study approach because the impact of dental health on the daily living of geriatric patients can be effectively answered using quantitative data. The outcome in numbers can be analyzed accurately. Hence a quantitative approach is finalized to carry the study further. Data will be collected one point in time and it will be primary research.

3.2 Study Duration:

This study was carried out during a period of six months after the approval of the Institutional Review Board i.e from 27th March to 27th August 2023.

3.3 Study Setting:

This study was conducted at public and private dental hospitals of Rawalpindi and Islamabad. Patients visiting the out-patient unit were selected using consecutive sampling technique from Margalla Institute of Health Sciences Rawalpindi.

3.4 Research Participants:

Study participants who were visiting the outpatient department of Dental hospital were selected on the basis of inclusion and exclusion criteria.

3.4.1 Inclusion Criteria:

- Participants of age 60 years and above visiting the outpatient department of Dental hospital were included in the study.
- Male and Female participants were included.

3.4.2 Exclusion Criteria:

- Participants who do not give consent to participate in the study.
- Participants who were sick during the time of study.
- Participants using fixed prosthesis for tooth loss were excluded.

3.5 Sample Size Calculation:

The sample size was calculated by using proportion formula for sample size calculation in Open-Epi Menu version 3.01. Previous prevalence of Oral health and its effect on life quality was taken as 76%(Leghari et al. 2020). Calculated sample size was 281 with 95% confidence interval (CI), 5% margin of error and 80% power of study.

3.6 Sampling Strategy:

A list of dental hospitals in Rawalpindi was obtained which included Fauji Foundation Dental Hospital Rawalpindi, Watim medical and dental college Rawalpindi, Margalla institute of health sciences Rawalpindi, and Armed Forces Institute of Dentistry Rawalpindi. By using simple random sampling technique, each dental hospital was assigned a random number. Using lottery method one dental hospital was selected, Margalla Institute of Health Sciences Rawalpindi. Desired sample from that dental hospital was collected using non-probability consecutive sampling strategy.

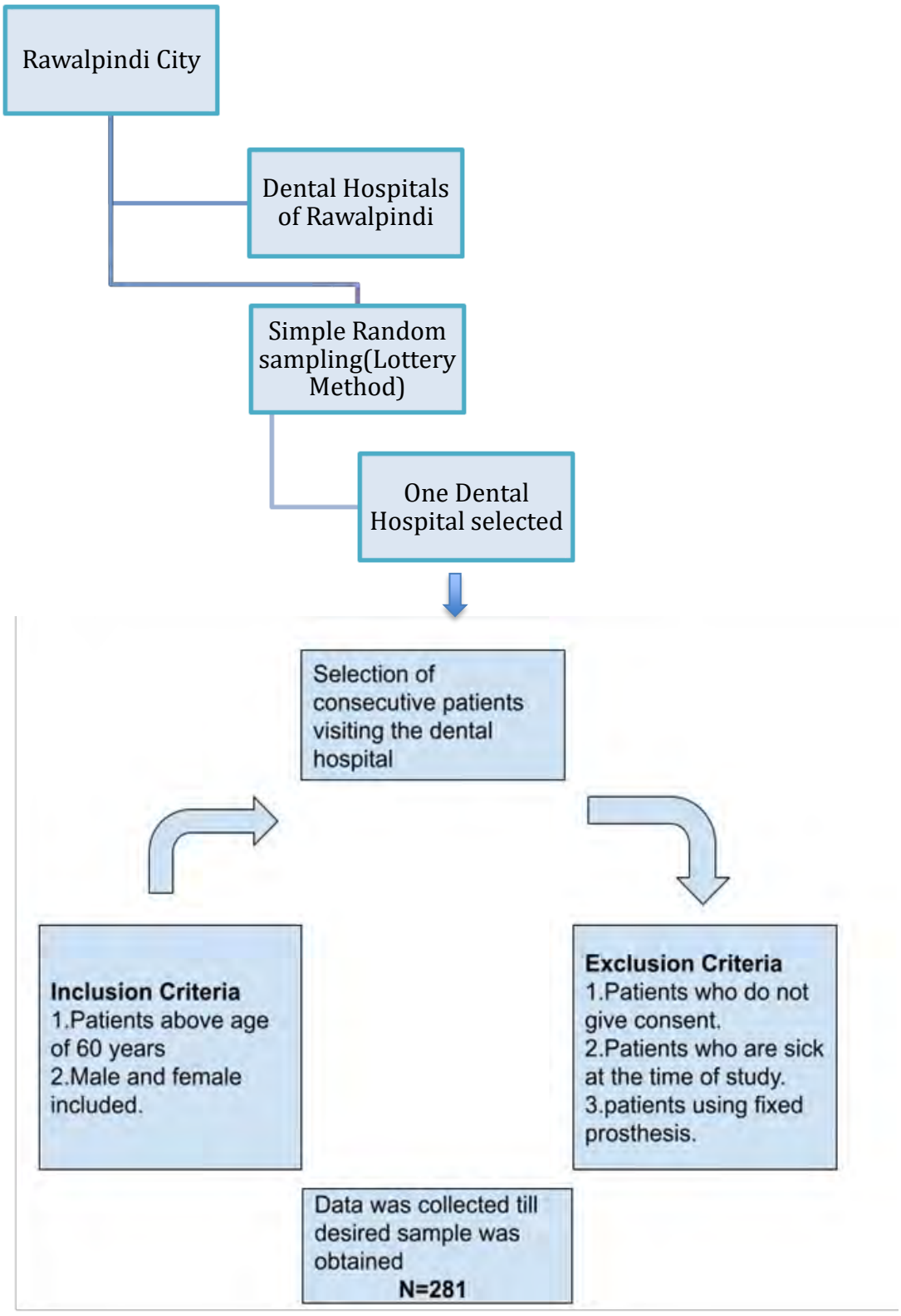

Figure: 2 Sampling Strategy

3.7 Data Collection Instrument:

3.7.1 Questionnaire Design:

Data was collected using interview-based questionnaire in which the researcher asked the questions from the respondents and recorded their responses accordingly. Questionnaire was devised after going through different research papers. A Proforma was developed in English language and later translated in to Urdu language, which is national language of Pakistan to collect data regarding socio-demographic characteristics of the respondents, DMFT (decayed, missing, filled teeth) index and dental impact on daily living (DIDL) among geriatric population visiting the out-patient department of Dental hospital. Validity of questionnaire was checked through public health specialist and public health care providers. Reliability analysis was done and Cronbach`s alpha coefficient was found to be 0.883. Pilot study was carried out and structured questionnaires were filed from 10% of total sample size i.e 28 participants were included and tool was modified after pilot testing accordingly. After finalization of research questionnaire, data was collected. Questionnaire is attached as Annexure - IV.

Reliability Statistics	**Scale**	**Cronbach`s Alpha**	**Number of Items**
	DIDL	0.883	23

3.7.2 Content of the Questionnaire:

The questionnaire contained three major sections.

1. First part included questions about socio-demographic characteristics.
2. Second part of questions included the DMFT index i.e Number of Decayed, Missing and Filled teeth which is used to measure the prevalence of dental caries and tooth decay in a population.
3. Third part included the DIDL tool (dental impact on daily living) which is used to measure the extent to which dental problems interfere with an individual's ability to perform daily activities such as eating, speaking, and socializing.

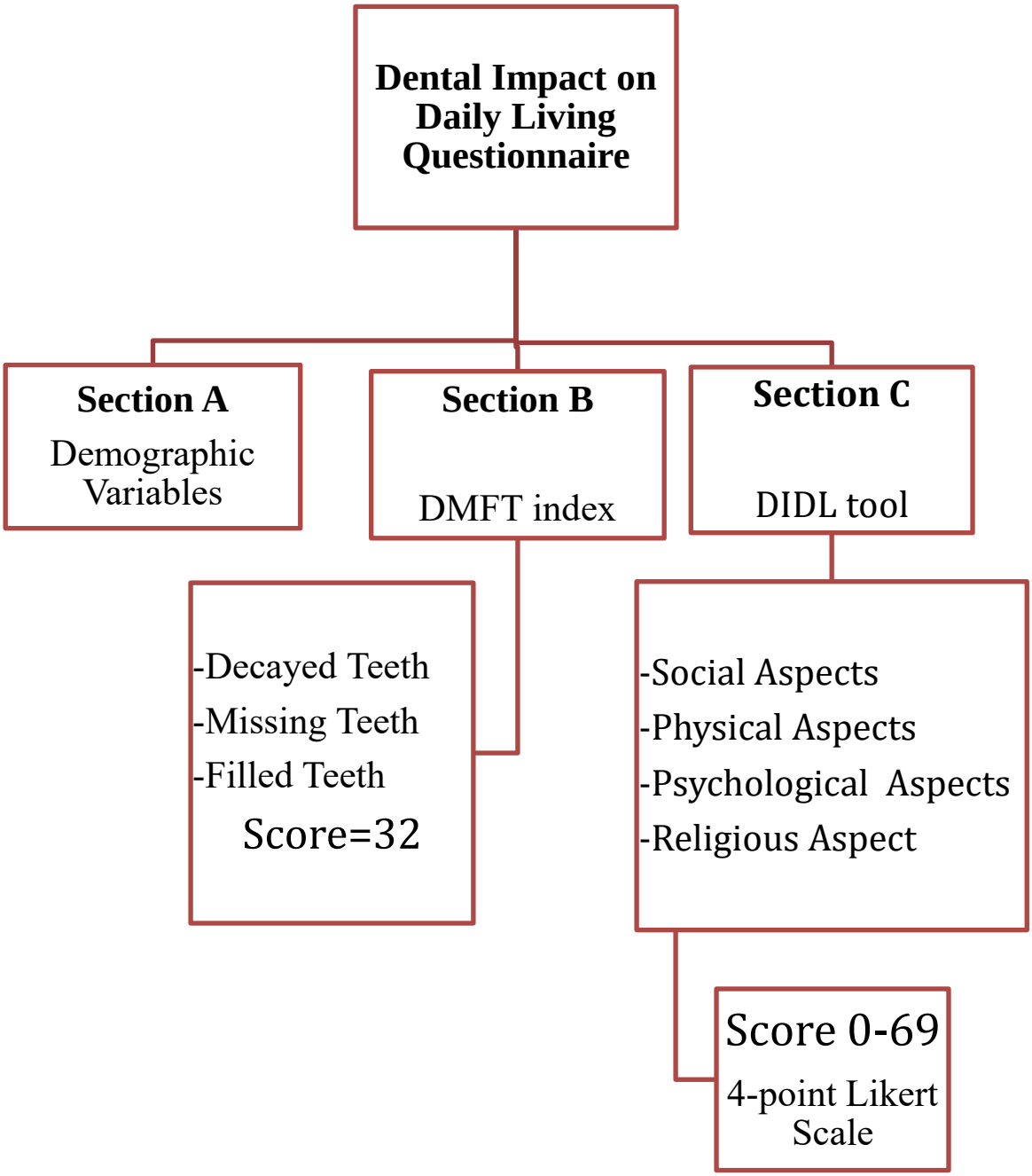

Figure 3: Components of Dental Impact on Daily Living Questionnaire

3.7.3 Study Variables:

The questionnaire has three parts:

1.Socio-demographic Variables

2.DMFT index:

Dental health of the study population will be assessed using Decayed Missing Filled Teeth (DMFT) index which gathers information about an individual`s dental health status. The questions are designed to be completed by dental professionals during dental examination. The DMFT score is obtained by adding up the number of decayed, missing, and filled teeth for each individual. The score can range from 0 to 32. A Higher DMFT score is indicative of poorer Oral health status of the individual.

3.Dental Impact on Daily Living (Outcome Variable):

For this study, Dental impact on Daily Living (DIDL) tool developed by Leao and Sheiham (kumar et al., 2015) will be adapted which measures the extent to which dental problems interfere with an individual's ability to perform daily activities such as eating, speaking, and socializing. The scoring is done using 4-point Likert scale, which assigns a value to each response ranging from 0 (no impact on daily living) to 3(severe impact). Options for questions are "Never", "Rarely", "Sometimes", and "Often", these responses will be assigned values of 0,1,2,3 respectively. After completing the questionnaire which comprises of a total of 23 questions, the scores of each question will be summed up to obtain a total DIDL score which can range from 0 to 69. Higher scores indicate a greater impact of dental problems on daily living.

3.7.3.2 Independent Variable:

Data on independent variables was collected through structured proforma that is constructed after international and national literature review. The proforma included socio-demographic variables such as age, gender, education, income, occupation, marital status, living arrangement, history of medical condition, history of tobacco use, frequency of tobacco use, number of decayed teeth, number of missing teeth and number of filled teeth.

3.8 Data Collection:

All the patients visiting Out-Patient department (OPD) of selected dental hospital were approached. Consent was taken orally from all the participants and only those participants were selected who agreed to take part in the research process and fulfill the inclusion criteria. After taking informed consent, the participants were interviewed and their responses were recorded by the researcher on the proforma.

3.9 Data Analysis Procedure:

Code book was developed and data was entered in Statistical Package for Social Science (SPSS) version 26. Data of qualitative demographic variables were entered in SPSS by using codes that were assigned to each category. Data of quantitative variables were entered in numerical form. After careful data entry, data was checked for any error before proceeding to further analysis. After data cleaning, data transformation was carried out for certain variables. Data analysis was done in two phases; descriptive analysis and inferential analysis.

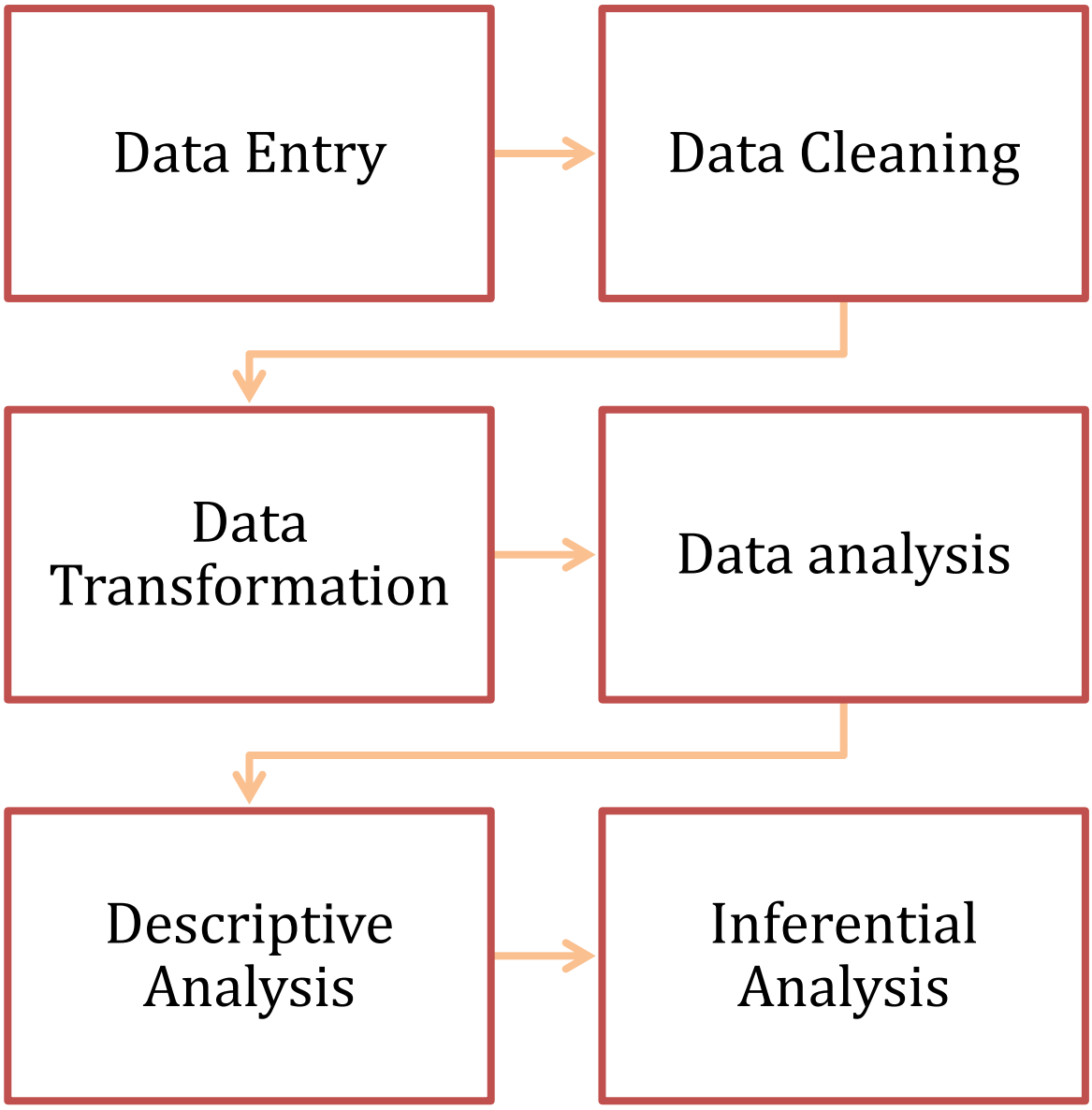

Figure 4: Data Analysis Plan on SPSS Version 26

3.9.1 Descriptive Analysis:

1.Descriptive Statistics were generated for sociodemographic characteristics such as age, gender, education, income, occupation, marital status, living arrangement, history of medical condition, history of tobacco use, frequency of tobacco use, number of decayed teeth, number of missing teeth and number of filled teeth.

2.Descriptive Statistics was run for outcome variable.

For categorical variables, data was summarized in the form of frequencies and percentages in table form. Continuous variables were summarized by mean and standard deviation as the data was normally distributed.

3.9.2 Inferential Analysis:

Chi-Square test was applied to Dental impact on Daily living scores (DIDL) with each sociodemographic variable. Further, Binary Logistic Regression Analysis was applied to get a more detailed insight into the predictors of dental impact on daily lives of geriatric population. A significant value of $p < 0.05$ was used for all statistical analysis.

3.10 Ethical Considerations:

IRB approval was taken from the ethical committee of Al-Shifa School of Public Health Rawalpindi after synopsis approval. Permission letter from the Head of Department of Al-Shifa School of Public Health was obtained regarding access to the dental hospitals of Rawalpindi. Before starting formal data collection, permission was taken from the Principal of dental hospital. Informed consent form was signed from every participant before the collection of data. The participants were assured for the confidentiality of their data and that the information is for study purpose only. All the information collected from the respondents would be kept strictly confidential. There

was no risk involved and no direct benefit to the participants. Data was entered in SPSS anonymously. After data entry, hard copies of collected data were kept at a safe place.

CHAPTER IV

RESULTS

Chapter IV: Results

4.1 Descriptive Results

4.1.1 Demographic characteristics:

A total of 281 respondents were included in this study. The minimum age reported was 60 years and the maximum age was 77 years. The mean age of the respondents was 64.39 ± 4.43. Among those, 154(54.54%) were male and 127(45.2%) were females, 74(26.3%) of the respondents were illiterate,87(31%) had educational level up to matric and 70(24.9%) were graduated. Government sector employees comprised of 50(17.8%) ,125(44.5%) were doing private sector jobs and 106(37.7%) were unemployed. Majority of the respondents (n=92,32.7%) had an income of less than 20,000 and 66(23.5%) respondents had an income of more than 100,000. The number of respondents who reported as non-smokers were 231(82.2%) and none of the respondents reported the intake of paan and betelnut. Among the smokers (n=50, 17.8%), majority (n=19, 6.8%) reported 4 cigarettes per day. History of chronic illness showed that 66(23.5%) respondents were having Diabetes, 48(17.1%) respondents were having heart diseases and 53(18.9%) respondents had multiple diseases at the time of this study.

Table 1: Demographic characteristics

Sociodemographic Variables	Categories	Frequency(n)	Percentage (%)
Gender	Male	154	54.58
	Female	127	45.2
Education	Illiterate	74	26.3
	Matric	87	31.0
	Intermediate	35	12.5
	Graduate	70	24.9
	18 Years or More	15	5.3
Occupation	Government sector	50	17.8
	Private sector	125	44.5
	Unemployed	106	37.7
Income	Less than 20,000	92	32.7
	20,000-50,000	50	17.8
	50,000-100,000	73	26.0
	More than 100,000	66	23.5
Marital Status	Unmarried	4	1.4
	Married	234	83.3
	Separate/Divorced	5	1.8
	Widow	38	13.5
Living Arrangement	Alone	10	3.6
	With spouse	99	35.2
	With children	70	24.9
	Spouse & children	102	36.3

SECTION II

4.1.2 Descriptive results for DMFT index:

A maximum of 6 decayed teeth were reported by the respondents with a mean of 2.12 ± 1.43. A maximum of 8 missing teeth were reported by the respondents with a mean of 2.73 ± 1.92 and a maximum of 5 missing teeth were reported by the respondents with a mean of 1.23 ± 1.21. The DMFT index is calculated by counting the number of teeth that fall into each category and adding up the scores. All decayed, missing, and filled teeth are therefore added up to get the DMFT score. The score can range from 0 to 32. A minimum of 0 DMFT score and a maximum of 12 score was reported. The mean DMFT score was 6.12 ± 2.60. It was divided into categories using SPSS software. The first category ranged from 0 to 3, second ranged from 4 to 8and third category ranged from 9 to 13. A Higher DMFT score is indicative of poorer oral health status of the individual.

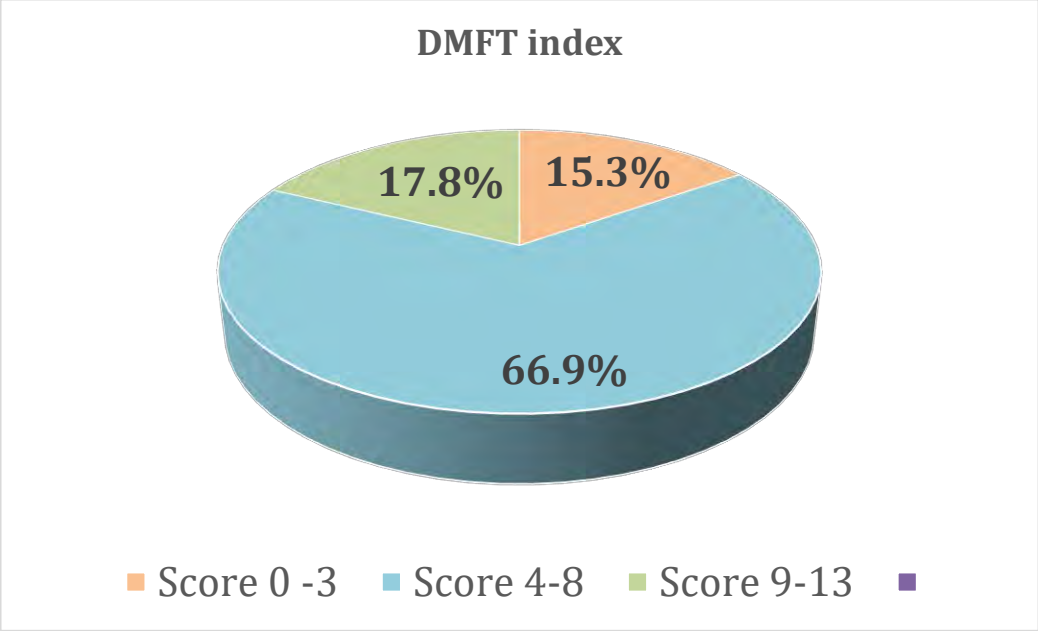

Figure 5: DMFT index

SECTION III

4.1.3 Descriptive Results of Dental Impact on Daily Living:

		Frequency (n)	Percentage (%)
Has your dental condition caused you pain or discomfort in the last month?	Never	21	7.5
	Rarely	81	28.8
	Sometimes	118	42.0
	Often	61	21.7
Has your dental condition caused you difficulty chewing in the last month?	Never	23	8.2
	Rarely	51	18.1
	Sometimes	75	26.7
	Often	132	47.0
Has your dental condition caused you difficulty in swallowing food in the past month?	Never	226	80.4
	Rarely	48	17.1
	Sometimes	7	2.5
	Often	0	0
Has your dental condition caused you difficulty in speaking in the past month?	Never	264	94.0
	Rarely	15	5.3
	Sometimes	2	0.7
	Often	0	0
Has your dental condition caused you difficulty in opening mouth in the past month?	Never	275	97.9
	Rarely	4	1.4
	Sometimes	2	0.7
	Often	0	0
Has your dental condition caused you difficulty in reading in the last month?	Never	268	95.4
	Rarely	8	2.8
	Sometimes	5	1.8
	Often	0	0

		Frequency (n)	Percentage (%)
Has your dental condition affected your sense of taste in the last month?	Never	266	94.7
	Rarely	15	5.3
	Sometimes	0	0
	Often	0	0
Has your dental condition affected your appetite in the last month?	Never	201	71.5
	Rarely	53	18.9
	Sometimes	23	8.2
	Often	4	1.4
Has your dental condition caused you difficulty in cleaning your teeth in the past month?	Never	185	65.8
	Rarely	63	22.4
	Sometimes	31	11.0
	Often	2	0.7
Has your dental condition caused you difficulty in maintaining personal hygiene in the past month?	Never	245	87.2
	Rarely	27	9.6
	Sometimes	9	3.2
	Often	0	0
Has your dental condition affected your socioeconomic status in the past month?	Never	104	37.0
	Rarely	54	19.2
	Sometimes	84	29.9
	Often	39	13.9
Has your dental condition caused you trouble in performing religious activities?	Never	142	50.5
	Rarely	99	35.2
	Sometimes	31	11.0
	Often	9	3.2

		Frequency (n)	Percentage (%)
Has your dental condition caused you difficulty in smiling in the past month?	Never	199	70.8
	Rarely	70	24.9
	Sometimes	2	0.7
	Often	10	3.6
Has your dental condition caused you difficulty in laughing in the past month?	Never	224	79.7
	Rarely	43	15.3
	Sometimes	4	1.4
	Often	10	3.6
Has your dental condition caused you embarrassment in the past month?	Never	189	67.3
	Rarely	78	27.8
	Sometimes	10	3.6
	Often	4	1.4
Has your dental condition caused you difficulty in socializing in the past month?	Never	209	74.4
	Rarely	58	20.6
	Sometimes	10	3.6
	Often	4	1.4
Has your dental condition affected your relationship with family in the past month?	Never	237	84.3
	Rarely	40	14.2
	Sometimes	4	1.4
	Often	0	0
Has your dental condition affected your relationship with friends in the past month?	Never	259	92.2
	Rarely	18	6.4
	Sometimes	4	1.4
	Often	0	0

		Frequency (n)	Percentage (%)
Has your dental condition affected your relationship with colleagues in the past month?	Never	259	92.2
	Rarely	22	7.8
	Sometimes	0	0
	Often	0	0
Has your dental condition caused you difficulty in work in the past month?	Never	145	51.6
	Rarely	80	28.5
	Sometimes	33	11.7
	Often	23	8.2
Has your dental condition caused you little interest or pleasure in doing things?	Never	106	37.7
	Rarely	99	35.2
	Sometimes	51	18.1
	Often	25	8.9
Has your dental condition made you less motivated to do work?	Never	88	31.3
	Rarely	112	39.9
	Sometimes	56	19.9
	Often	25	8.9
Has your dental problem made it difficult for you to perform daily life activities?	Never	89	31.7
	Rarely	103	36.7
	Sometimes	62	22.1
	Often	27	9.6

4.1.3.1 Dental Impact on Daily Living:

The scoring is done using 4-point Likert scale, which assigns a value to each response ranging from 0 (no impact on daily living) to 3(severe impact). Options for questions are “Never”, “Rarely”, “Sometimes”, and “Often”, these responses will be assigned values of 0,1,2,3 respectively. A total of 23 questions are included in this study and the scores of each question will be summed up to obtain a total DIDL score which can range from 0 to 69. A minimum of 0 and a maximum of 44 score was obtained with a mean of 12.85 ± 8.28. Higher scores indicate a greater impact of dental problems on daily living.

4.1.3.2 Transformation of data:

Data was transformed and the DIDL was divided into categories using SPSS. Data was divided into three categories. The first category was low impact on daily living ranging from 0 to 14, moderate impact on daily living ranging from 15 to 29, and high impact on daily living ranging from 30 to 44 as shown in Figure 6.

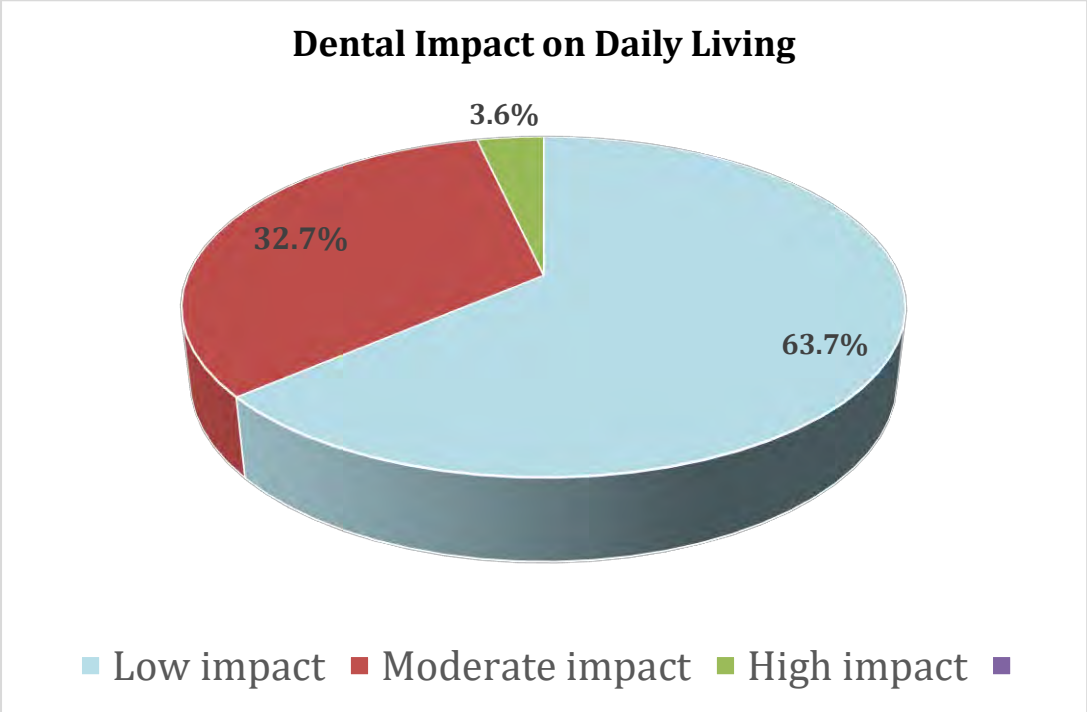

Figure 6: Dental Impact on Daily Living

4.2 Inferential Results:

The chi-square test of independence was applied to examine the association between sociodemographic variables and the Decayed, Missing, and Filled teeth (DMFT) index. Chi-Square test was also applied to Dental impact on Daily living scores (DIDL) with each sociodemographic variable. Association between DMFT index and DIDL index was also recorded. Results for each variable are shown in the following table:

Table 3: Association of Sociodemographic Variables with DMFT

Sociodemographic Factors	**Decayed Missing Filled Teeth (DMFT index)**				
	0-3 (Good Dental Health)	**4-8** (Moderate Dental Health)	**9-13** (Poor Dental Health)	$X^2(df)$	**P-Value**
Age Groups					
60-65 years	31(16.6%)	126(67.4%)	30(16.0%)	25.4 (4)	**0.001**
66-71 years	2(3.0%)	44(66.7%)	20(30.3%)		
72-77 years	10(35.7%)	18(64.3%)	0(0.0%)		
Gender					
Male	22(14.3%)	102(66.2%)	30(19.5%)	0.79 (2)	0.671
Female	21(16.5%)	86(67.7%)	20(15.7%)		
Education					
Illiterate	4(5.4%)	38(51.4%)	32(43.2%)	92.6(8)	**0.001**
Matric	6(6.9%)	75(86.2%)	6(6.9%)		
Intermediate	4(11.4%)	21(60.0%)	10(28.6%)		
Graduate	20(28.6%)	48(68.6%)	2(2.9%)		
18 years or more	9(60.0%)	6(40.0%)	0(0.0%)		

Income					
Less than 20,000	16(17.4%)	48(52.2%)	28(30.4%)	61.2(6)	**0.001**
20,000-50,000	0(0.0%)	50(100%)	0(0.0%)		
50,000-100,000	4(5.5%)	55(75.3%)	14(19.2%)		
More than 100,000	23(34.8%)	35(53.0%)	8(12.1%)		
Occupation					
Government	17(34.0%)	13(26.0%)	20(40.0%)	49.3(4)	**0.001**
Private	10(8.0%)	101(80.8%)	14(11.2%)		
Unemployed	16(15.1%)	74(69.8%)	16(15.1%)		
Marital Status					
Unmarried	0(0.0%)	2(50.0%)	2(50.0%)	22.0(6)	**0.001**
Married	40(17.1%)	156(66.7%)	38(16.2%)		
Divorced/separated	3(60.0%)	0(0.0%)	2(40.0%)		
Widow	0(0.0%)	30(78.9%)	8(21.1%)		
Living Arrangement					
Alone	1(10.0%)	6(60.0%)	3(30.0%)	18.2(6)	**0.006**
With Spouse	22(22.2%)	71(71.7%)	6(6.1%)		
With Children	6(8.6%)	47(67.1%)	17(24.3%)		
Spouse & Children	14(13.7%)	64(62.7%)	24(23.5%)		
History of Tobacco Use					
Smokers	4(8.0%)	40(80.0%)	6(12.0%)	4.8 (2)	0.90
Non-smokers	39(16.9%)	148(64.1%)	44(19.0%)		

History of Chronic Illness					
Diabetes	2(3.0%)	60(90.9%)	4(6.1%)	157.1(8)	**0.001**
Heart Disease	0(0.0%)	28(58.3%)	20(41.7%)		
Others(resp,cancer etc)	18(100%)	0(0.0%)	0(0.0%)		
Multiple Diseases	0(0.0%)	45(84.9%)	8(15.1%)		
None	23(24.0%)	55(57.3%)	18(18.8%)		

Interpretation of Data:

The results of this study showed that there was a significant association between DMFT index and Age (p-value=0.001). Maximum number of respondents reporting to dental hospitals were falling in category 1 age 60-65 years age and reported good to moderate dental health as shown in Table 3. As age increases i.e category 2 (66-71 years), dental health declined to moderate to poor dental health. Very few respondents were falling in category 3(72-77years) age, which can be due to low life expectancy or due to other health issues being prioritized over dental health.

A significant association between DMFT index and Education (p-value=0.001) was also reported. As education level increase towards graduation and 18 years or more, number of respondents reporting to dental hospital decrease and reported good to moderate dental health.

A positive association was seen between DMFT index and Income(p-value=0.001). Respondents with income of less than 20,000 reported with moderate to poor dental health. Respondents who had an income of 100,000 or more reported good (34.8%) and moderate dental health (53.0%) as shown in Table 3. Similarly, a positive association was seen between DMFT index and occupation(p-value=0.001). Maximum number of respondents reporting to the dental hospital were doing private service which can be due to the fact that people working in private jobs often have stable incomes and find it convenient to afford dental care. Many unemployed persons also reported in large number to dental hospital as the study was conducted in teaching hospital where dental services were provided at lower cost. Both groups reported maximum number of respondents in moderate dental health i.e (80.8%) and (69.8%) respectively.

The results of this study showed that there was a significant association between DMFT index and marital status(p-value=0.001). Married respondents reported good to

moderate dental health. Widows reported moderate to poor dental health which could be due to combination of personal, social and economic factors. They may have financial challenges which can affect their ability to afford dental check-ups. Grieving the loss of a spouse can be emotionally overwhelming, causing some individuals to neglect their own self-care. Similarly, that there was a significant association between DMFT index and living arrangement (p-value=0.006). Those living alone reported to dental hospital in minimum number and reported moderate to poor dental health.

A positive association was reported between DMFT index and history of chronic illness (p-value=0.001).Maximum number of patients reporting to the dental hospital had no history of disease and presented with good dental health (24.0%) to moderate dental health (57.3%) .Respondents with diabetes reported with moderate to poor dental health as dental caries increases in diabetics (Latti et al. 2018).

Table 4: Association of Sociodemographic Variables with Daily Living

Sociodemographic Factors	**Dental Impact on Daily Living Score (DIDL score)**				
	0-14 (low impact)	**15-29 (moderate impact)**	**30-44 (high Impact)**	$X^2(df)$	***p*-Value**
Age Groups					
60-65 years	117(62.6%)	64(34.3%)	6(3.2%)	20.7(4)	**0.001**
66-71 years	34(51.5%)	28(30.4%)	4(6.1%)		
72-77 years	28(15.6%)	0(0.0%)	0(0.0%)		
Gender					
Male	119(77.3%)	33(21.4%)	2(1.3%)	28.0(2)	**0.001**
Female	60(47.2%)	59(46.5%)	8(6.3%)		
Education					
Illiterate	26(35.1%)	40(54.1%)	8(10.8%)	78.0 (8)	**0.001**
Matric	48(55.2%)	39(44.8%)	0(0.0%)		
Intermediate	24(68.6%)	11(31.4%)	0(0.0%)		
Graduate	66(94.3%)	2(2.9%)	2(2.9%)		
18 years or more	15(100%)	0(0.0%)	0(0.0%)		

Sociodemographic Factors	**Dental Impact on Daily Living Score (DIDL score)**				
	0-14 (low impact)	**15-29 (moderate impact)**	**30-44 (high Impact)**	***X^2(df)***	***p*-Value**
Income					
Less than 20,000	52(56.5%)	36(39.1%)	4(4.3%)	35.8 (6)	**0.001**
20,000-50,000	40(80.0%)	10(20.0%)	0(0.0%)		
50,000-100,000	31(42.5%)	38(52.1%)	4(5.5%)		
More than 100,000	56(84.8%)	8(12.1%)	2(3.0%)		
Occupation					
Government	35(70.0%)	13(26.0%)	2(4.0%)	10.8 (4)	**0.029**
Private	89(71.2%)	32(25.6%)	4(3.2%)		
Unemployed	55(51.9%)	47(44.3%)	4(3.8%)		
Marital Status					
Unmarried	0(0.0%)	4(100%)	0(0.0%)	25.0 (6)	**0.001**
Married	158(67.5%)	67(28.6%)	9(3.8%)		
Divorced/separated	4(80.0%)	0(0.0%)	1(20.0%)		
Widow	17(44.7%)	21(55.3%)	0(0.0%)		

Sociodemographic Factors	**Dental Impact on Daily Living Score (DIDL score)**				
	0-14 (low impact)	**15-29 (moderate impact)**	**30-44 (high Impact)**	**X^2(*df*)**	***p*-Value**
Living Arrangement					
Alone	2(20.0%)	8(80.0%)	0(0.0%)	31.5 (6)	**0.001**
With Spouse	79(79.8%)	16(16.2%)	4(4.0%)		
With Children	47(67.1%)	21(30.0%)	2(2.9%)		
Spouse & Children	51(50.0%)	47(46.1%)	4(3.9%)		
History of Tobacco Use					
Smokers	34(68.0%)	14(28.0%)	2(4.0%)	0.62 (2)	**0.731**
Non-Smokers	145(62.8%)	78(33.8%)	8(3.5%)		
History of Chronic Illness					
Diabetes	38(57.6%)	26(39.4%)	2(3.0%)	50.7 (8)	**0.001**
Heart Disease	16(33.3%)	28(58.3%)	4(8.3%)		
Others(resp,cancer etc)	18(100%)	0(0.0%)	0(0.0%)		
Multiple Diseases	49(92.5%)	4(7.5%)	0(0.0%)		
None	58(60.4%)	34(35.4%)	4(4.2%)		

Interpretation of data:

The results of association between the dental impact on daily living (DIDL) and sociodemographic variables showed that there was a significant association between DIDL index and Age (p-value=0.001). Respondents in age group 60-65 years had the least impact on their daily lives due to dental health (62.6%). Participants in age group 72-77 years reported to dental hospital in lesser number and reported least impact on their lives due to their dental health as most of them were using prosthesis to replace their lost teeth and had other issues in daily lives that were given priority over dental health.

A positive association was reported between the dental impact on daily living (DIDL) and Gender (p-value=0.001). Male participants reported lower impact on daily lives (n=119) while females reported lower to moderate impact on daily lives (n=219) and (n=8 , 6.3%) reported high impact on daily lives due to dental health as shown in Table 4.

A positive association was reported between the dental impact on daily living (DIDL) and Education (p-value=0.001). The higher the education, the lesser impact dental health had on daily living of geriatric population i.e 94.3% of respondents were graduated and had low impact of dental health on daily living and 100% of the respondents with 18 years of education had low impact of dental health on daily living. Similarly, dental impact on daily living (DIDL) had statistically significant association with Income(p-value=0.001). Respondents with income of more than 100,000 reported low impact of dental health on daily living. Also statistically significant association was found between the dental impact on daily living (DIDL) and occupation(p-value=0.029). Maximum respondents were private employees with lower impact of

dental health on daily lives which could be due to convenience in affordability of dental services.

The results of association between the dental impact on daily living (DIDL) and marital status(p-value=0.001) also showed statistically significant results. Married individuals reporting to dental hospitals reported low impact of dental health on daily living which could be due to emotional support provided by the spouse, making it easier to cope with dental issues or seek necessary dental care. Similar results were obtained with living arrangement (p-value=0.001) as shown in table 4.

The results of association of the dental impact on daily living (DIDL) with history of chronic illness (p-value=0.001) were also statistically significant. Individuals with multiple diseases reported low impact on their daily lives due to dental health. This could be due to the fact that dental health was not a priority for them who are already undergoing multiple issues in life. Individuals with no disease reported low to moderate impact on daily lives due to dental health as only dental health was affecting their functional abilities.

In this study, the results of association between the DMFT index and dental impact on daily living (DIDL) showed statistically significant results **(p-Value=0.001).** Good and moderate dental health was reported by the individuals who had low impact on daily living. The individuals with poor dental health reported moderate to high impact of dental health on daily living as shown in Table 5.

Table 5: Association between DMFT index and DIDL index

DMFT index	Dental Impact on Daily Living Score (DIDL score)				
	0-14 (low impact)	**15-29 (moderate impact)**	**30-44 (high Impact)**	**X^2(*df*)**	***p*-Value**
0-3 (Good Dental Health	39(90.7%)	4(9.3%)	0(0.0%)	76.8 (4)	**0.001**
4-8(Moderate Dental Health)	127(67.6%)	61(32.4%)	0(0.0%)		
9-13(Poor Dental Health)	13(26.0%)	27(54.0%)	10(20.0%)		

Binary Logistic Regression Analysis:

The chi-square test of association was followed by Binary Logistic Regression Analysis using SPSS to understand the relationship between one or more predictor variables and the binary outcome variable. For this purpose, the categories of significant variables are converted into dichotomous variables. The independent variables were also converted in to dichotomous variables. The main goal of this analysis is to model the probability of occurrence of one of the two categories based on the predictor variable as shown in table 6.

The model`s overall significance was tested using Wald Chi-Square statistic. The result was significant (X^2=51.24, p-value=0.000), indicating that the model is statistically significant which shows that there is a significant improvement in fit with predictor variables as compared to the null model, hence a good fit model. The Hosmer-Lemeshow statistic test reported a significant value of 0.097 which is greater than 0.05, indicating a good fit and showing no difference in the observed and predicted model. The Nagelkerke R Sqaure value of (0.324) indicates that approximately 32.4% of the variance in the outcome variable can be explained by the predictor variables included in the model.

Table 6: Binary Logistic Regression Results for predicting Outcome Variable

Predictor Variables	**B (SE)**	**P-Value**	**O R**	**CI 95% (LL,UL)**
Gender Male=0 Female=1	1.94(0.69)	**0.005**	6.98	1.7,27.2
Education(years) Less than 12=0 More than 12=1	0.42(0.66)	0.522	1.52	0.4,5.6
Occupation Employed=0 Unemployed=1	0.90(0.55)	0.102	2.46	0.8,7.2
Living Arrangement Alone=0 Family=1	-3.07(1.05)	0.004	0.04	0.0,0.3
Marital Status Single=0 Married=1	0.21(0.56)	0.706	1.23	0.4,3.7
DMFT(Dental health) Score 0-21(good)=0 Score 22-44(poor)=1	1.86(0.49)	**0.0001**	6.43	2.4,16.9

Results of Logistic Regression Analysis indicated a substantial association between gender and the level of impact experienced in daily life activities (p-value=0.005). The odds of females (category 1) are approximately 6.98 times higher for moving to a higher category of the outcome variable which is the impact on daily living as compared to male individuals (reference category 0) while keeping all other variables constant. The other significant predictor variable is the dental health of the individual obtained using decayed, missing, filled teeth. The relationship of dental health with the impact on daily living is highly statistically significant (p-value < 0.001). With each unit increase in decayed, missing, filled teeth (DMFT) score, the odds of moving to a higher category of the outcome variable is increased by 6.43 times.

Living arrangement shows a negative association with the increase in impact on daily living(p-value=0.004). Living with family significantly decreases the odds of impact on daily living occurring. Education(p-value=0.52), occupation(p-value=0.102), and marital status(p-value=0.706) showed a statistically insignificant impact on daily living. The odds ratio however suggests that an increase in one unit of education increased 1.52 times increase of falling in the higher category of impact on daily living, unemployed individuals had 2.46 times more odds of falling in higher category of impact on daily living. While the odds ratio implies a potential effect, the high p-value suggests that this could me due to change. Further investigation and replication of this finding are required to draw firm conclusions.

CHAPTER V

DISCUSSION

Discussion:

This cross-sectional study assessed the impact of dental health on the daily living of geriatric population visiting dental hospitals of Rawalpindi. Association between the dental impact on daily living (DIDL) and sociodemographic variables showed that there was a statistically significant association between DIDL index and Age (p-value=0.001), Gender (p-value=0.001), Education (p-value=0.001), Income(p-value=0.001), occupation(p-value=0.029), marital status(p-value=0.001), living arrangement (p-value=0.001), and history of chronic illness (p-value=0.001) and DMFT (p-Value=0.001). Binary Logistic Regression Analysis indicated gender [OR= 6.98, p-value=0.005] and dental health of the individual obtained using decayed, missing, filled teeth [OR= 6.43, p-value=0.001] are the strongest predictors of the level of impact experienced in daily life activities.

A cross sectional study was conducted in Nova Scotia in 2012 for prevalence of impact on Oral Health related quality of life which reported that the individuals who lived in rural area, were females, have less education, make less money per year, visit the dentist very rarely were having fair or poor quality of life scores and were dissatisfied with their teeth. Logistic Regression models was used to assess the prevalence of impacts for community and long-term care residents separately. For community dwelling individuals, those living in rural areas, having oral pain, poor perceived dental health and dissatisfaction with teeth were 2.0 times more likely to report and impact 'fairly/very often'. Among those living in long term care facilities, those with less education were 2.3 times more likely to report an impact 'fairly/very often'. Individuals with poor perceived dental health were 10 times more likely to report impact. A similar study conducted in Sweden in 2022, evaluated the oral health-related quality of life and its associated factors among older people in short term care. The study reported poor

OHRQoL in 34% of the old age individuals. Associated factors were swallowing issues according to Revised Oral Assessment Guide ROAG Other factors reported were poor oral health, poor self-perceived oral health, physical and psychological health. Female gender was associated with more severe impact on quality of life. So, it was concluded that there is a positive association between OHRQoL and self- perceived dental health of older individuals.

In the present study respondents with income of more than 100,000 (n=56,84.8%) reported low impact of dental health on daily living which could be due to stable incomes, they find it more convenient to afford dental care compared to those with unstable or lower incomes. Also, statistically significant association was found between the dental impact on daily living (DIDL) and occupation(p-value=0.029). Maximum respondents were private employees with lower impact of dental health on daily lives which could be due to convenience in affordability of dental services, flexible working hours to visit the dentist, accessibility to dental hospital, employee benefits including health insurance that may cover dental care. A study was conducted in Iran to assess the impact of oral health on the daily activities of individuals. The study found that 82.6% of the participants had experienced one or more oral impacts on their daily life activities. These impacts could be due to various oral health issues affecting their ability to perform daily tasks comfortably. Nearly half of the impacts reported (49.5%) were considered severe or very severe, indicating that oral health problems had a substantial negative effect on participant`s ability to carry out their daily activities. The oral impact on daily performance was higher in participants with a lower wealth index. This suggests that individuals with lower socioeconomic status were more significantly affected by oral health issues (Mohebbi et al. 2014).It was suggested in another study that among subject from lower social class, there appeared to be a weak correlation

between dental impact on daily living and their oral health status, because they prioritized different aspects of life rather than dental health (Ganesh and John 2013).

A study conducted in 2019 evaluated oral health status of population based on Decayed, Missing, and filled teeth (DMFT) index. The results of the study showed that DMFT was significantly associated with age (p=0.001), marital status (p=0.001), education (p=0.001), socioeconomic status (p=0.001).Poor DMFT scores were achieved in people with age 35-45 years of age (DMFT=7.83),widows (DMFT=9.05), people with low literacy rate (DMFT=8.1) and people belonging to low socio-economic class (DMFT=8.9).As individuals grow older, the study revealed a notable trend; the DMFT index tends to become increasingly unfavorable (Moradi et al. 2019). This can be attributed to a higher prevalence of decayed, missing and filled teeth with advancing age. Consequently, the World Health Organization (WHO) establishes a higher DMFT Index benchmark for older age groups(Organization 2013).These results were similar to the results obtained in present study.

A Study was conducted in 2020 to assess the association between caries and Oral Health Related Quality of Life (OHRQoL) to understand its impact on daily living of people. The results of the study showed that 87.6% of the people visiting the hospital had one or more decayed teeth. Among various dimensions assessed by DIDL scale, two of the most frequently reported impacts on daily living were difficulty eating and disturbances in relaxation and sleeping patterns. In the present study most frequently reported impact on daily living was ability to chew. A total of 132(47.0%) of the individuals reported difficulty in chewing “Often”. Adults with caries demonstrated increased odds of reporting higher oral impacts in comparison to those without caries. The presence of caries in individuals was associated with a higher likelihood of reporting more frequent and severe oral impacts that had tangible effects on their daily lives. As the exposure to

caries increased, there was a linear rise in the oral impact on daily performance (OIDP)score, signifying a direct correlation between caries and the negative impact on oral- health related quality of life (Bin Shahzad et al. 2020) .

A study was conducted in 2022 in Kosovo to evaluate the impact of dental on daily living and oral health-related quality of life. The results of this study showed that while comparing the independent variables, gender was significantly different when total scores of DIDL were compared. Female patients reported a higher satisfaction with their quality of life as compared to male patients. Linear Regression Analysis also confirmed the impact of gender on DIDL scores (Haliti et al. 2022).Some other studies also confirmed that females are more concerned about their dental and physical appearance as compared to males(a et al. 2021). Another study also reported that females act more positively towards dental health as compared to males (Hamasha et al. 2018).These findings are in contrast to my study in which male participants reported lower impact on daily lives (n=119) while females reported lower to moderate impact on daily lives (n=219) and (n=8,6.3%) reported high impact on daily lives due to dental health.). The odds of females are approximately 6.98 times higher for transitioning in to high impact on daily living as compared to male individuals. A study conducted in turkey in 2008 reported mean DMFT index of 11.4 and Significant caries index of 14.00 increasing with increasing age of the participants. Logistic Regression analysis reported that older age, females were significant risk factors for high caries index (Namal et al. 2008).

The present study reported association between the dental impact on daily living (DIDL) and marital status(p-value=0.001) also showed statistically significant results. Married individuals reporting to dental hospitals reported low impact of dental health on daily living which could be due to emotional support provided by the spouse, making

it easier to cope with dental issues or seek necessary dental care. Similar results were obtained with living arrangement (p-value=0.001). Another study conducted by in India reported that female`s dental health is significantly affected by social, economic and psychological factors (Shah, N. et al 2003). Similarly, a study conducted in Korea in 2014, assessed the quality of life of single, married, separated and divorced females and reported that married woman had better scores. Among married men ages 40-69 years of age, highest quality of life scores were reported. Women ages 40-69 years of age ad single had lower scores as compared to married women. Thus it was concluded that significant positive association was found between marital status and quality of life in older ages (Han et al. 2014).

Chapter VI: Conclusion, Strengths and Limitations

Conclusion:

The cross-sectional study highlighted the effect of age, gender, income, education, marital status and the dental health condition on the daily lives of geriatric population. The findings of this study highlight the importance of addressing dental health issues and providing adequate dental care, especially in vulnerable populations. Improving access to dental services at affordable cost and promoting preventive oral health measures to help reduce the negative impact of oral health problems on daily living and the overall wellbeing of an individual. Dental health should be prioritized by individuals of all ages, gender, social class, marital relations, and educational level. Regular dental check-ups and treatments should be taken to maintain good oral health that will have a positive impact on overall well-being. Good oral hygiene practices and preventive care are essential for everyone as it can have an impact on the daily living of the individuals.

Strengths:

- Very limited research is done on the impact of dental health on daily living of geriatric population.
- Validated data collection tool was used for this study.
- The use DIDL questionnaire allows for more comprehensive assessment of the impact of oral health on various aspects of daily life, providing a holistic understanding of participant`s experience.
- Data for DMFT were filled by the researcher herself, and data was collected by each individual through interview-based questions.
- The study was conducted in a teaching dental hospital were individuals from all social class visit for their dental checkup especially those from lower social

class as the treatment is provided at affordable cost, thus providing valuable insights into oral health challenges faced by marginalized communities.

- This study may contribute to filling gaps in existing literature on oral health`s impact on life functioning.

Limitations:

- It is a study of cross-sectional design, so it can provide only a snapshot of the relationship between the impact on daily living and dental health status at a specific point in time. Longitudinal studies would be more appropriate for establishing causal relationships and changes over time.
- Only one instrument DIDL was used to assess the impact on daily lives. Further qualitative studies can be done to more accurately assess the dimensions of quality of life and how they influence the dental health and daily living of an individual.
- Subjects from different social class may have different priorities in life that may influence their oral behaviors and decisions.
- The findings may not be representative of the broader population as it was conducted in one of the dental hospitals, so it may be challenging to generalize the results to individuals from different social, economic and educational backgrounds.

Chapter VII: Recommendations and Way Forward

This study emphasizes the critical role of dental health in the overall well-being of an individual. The oral health of the geriatric population is often associated with functional limitations, which can impact their ability to perform daily activities. It is therefore important to study this complex and multi-faceted issue that has far-reaching implications for the overall health and well-being of an individual and to address and recognize these issues to improve the daily living of older adults.

Based on the findings of this study, the following recommendations seem relevant and important:

6. 1 For the individual:

- The elderly population should be encouraged to get regular dental check-ups. Early Diagnosis and prompt treatment of oral health issues can prevent the individual from severe issues and financial burdens.
- One should maintain daily oral hygiene practices including brushing twice daily with fluoride toothpaste to minimize chances of dental caries.
- Talk to your partner and children with issues that you are facing including personal, social, emotional, financial issues that can affect the quality of life of an individual.
- Maintaining sound psychological health at this age is also very important for daily life functioning.
- Regular communication with your family and your doctor can ensure a comprehensive approach to dental care in old age.

6.2 For the community:

- Organize community-based oral health education programs to raise awareness about the importance of good oral hygiene practices and regular dental check-ups.
- Organize dental camps in the community, especially in marginalized areas to provide free or low-cost dental check-ups and treatments to those who may have limited access to dental care.
- Work with local authorities and healthcare providers to improve access to affordable and quality dental care services particularly in vulnerable populations.
- Engage community leaders, religious organizations, and local influencers to advocate for oral health and encourage the people to prioritize oral health.
- Organize regular oral health screening events in community centers and other public spaces for early identification and detection of oral health issues.

6.3 For the policy makers:

- Develop gender-specific interventions or support systems to address the identified gender differences in daily life impact. It would be valuable to investigate the reasons behind this gender difference in impact on daily living.
- Promote oral health education and access to dental care, particularly for those at higher risk. The results of this study underscore the importance of oral health and its impact on overall well-being.
- Encourage and strengthen family support systems to reduce the impact on daily living.
- Oral health education programs at all levels should be implemented.

- Continuously assess the impact of oral health programs and interventions through data collection and analysis. Use the findings to improve and refine future initiatives, contributing to evidence-based policy making.
- Engage in international cooperation and learn from successful oral health policies implemented in other countries to improve oral health on a global scale.

6.4 Way Forward:

Oral health disparities are increasingly significant and influenced by social, economic, educational and many other factors. A patient-centered approach to oral care, considering social, economic, physical and psychological factors is vital for enhancing oral health and overall well-being. Comprehensive oral health policies that prioritize prevention and address oral health disparities are needed to integrate oral health into overall healthcare initiatives. We can work towards a future where oral health disparities are reduced, access to dental care is improved, and individuals and communities are empowered to take charge of their oral health. The way forward requires collaboration, innovation, and a commitment to promoting oral health as an integral part of a healthy and thriving society.

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ANNEXURE I

Gantt Chart

ACTIVITIES	March 2023	April 2023	May 2023	June 2023	July 2023	August 2023
Topic Selection Literature Search						
Synopsis and IRB approval						
Pilot Testing						
Data Collection						
Data Analysis						
Thesis Writeup						
Thesis submission and Thesis Defense						

ANNEXURE II

Proposed Budget

Budget item	Transport	Stationery and Internet	Printing
Pilot Testing	5000 Rs/-	1000 Rs/-	2000 Rs/-
Data Collection	5,000 Rs/-	5,000 Rs/-	-
Thesis write- up	2,000 Rs/-	2,000 Rs/-	4,000 Rs/-
Total Expenditure	12,000 Rs/-	8,000 Rs/-	6,000 Rs/-
Grand Total	26,000 Rs/-		

ANNEXURE III

Informed Consent Form

Title of study:

Impact of oral health associated functional limitation on daily living of geriatric population in Rawalpindi city.

Principal investigator:

Saadia Ayub

MSPH student, Al-Shifa School of public health Rawalpindi.

Purpose of this study:

Pakistan is a developing country, having multiple challenges. So, a rise in the ratio of aged people and their declining health pose a burden on healthcare system. This research will focus on the impact of Oral health associated functional limitations on daily living of old age individuals. Functional limitations such as difficulty eating, speaking, smiling, chewing and its psychosocial effects can affect a person`s life satisfaction as well as daily living. It is therefore important to study this complex and multi-faceted issue that has far reaching implications for the overall health and well-being of an individual and to address and recognize these issues to improve the daily living of older adults.

Subject participation:

Your participation will help the researcher to assess the impact of oral health associated functional limitation on the daily living of geriatric population and to determine the

factors that influence the relationship between oral health associated functional limitations and daily living of geriatric population.

Procedure:

Data will be collected from individuals of 60 years and above using an interview-based questionnaire to collect demographic information, oral health associated functional limitation and impact on daily living of old age population.

Time required:

It is anticipated that it will take approximately 5 to 10 minutes to complete the questionnaires.

Voluntary participation:

Your participation in this study is voluntary. It is up to you to decide whether to take part in this study or not. If you decide to take part in this study, you will be asked to sign a consent form.

Right to Withdraw:

After you sign the consent form, you are still free to withdraw at any time and without giving a reason. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

Confidentiality:

Data will be completely anonymous and reported in aggregate form. Your name will not be collected at any time.

Risks:

While answering the questions, you will be asked some personal information that you might not feel comfortable with. If you do not feel comfortable, you can refuse to take part in this survey. However, it is important to note that there are no significant risks associated with this study.

Benefits:

There are no direct benefits associated with participation in this study, but your participation will help the researcher to find out the impact of oral health associated functional limitation on the daily living of geriatric population. It will help the other researchers to carry out more work on this topic to highlight main issues.

Payment:

You will receive no payment for participating in the study.

Contact information:

If you have questions about the study, please contact the following individual:

Saadia Ayub
xyz_xyz@gmail.com
Contact # 03231234567

Consent:

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Name of Participant_____

Signature of Participant _____

Date _____ (DD/MM/YY)

Statement by the researcher/person taking consent:

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that. I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily. A copy of this Informed Consent Form (ICF) has been provided to the participant.

Name of Researcher/person taking the consent_____

Signature of Researcher /person taking the consent_____

Date _____ (DD/MM/YY)

ANNEXURE IV

QUESTIONAIRRE

SECTION I

	سوالنامہ
1. Age ----------	1. عمر
2. Gender	2.جنس
i. Male	مرد
ii. Female	عورت
3.Education	3.تعلیم
i. Illiterate	ناخواندہ
ii. Matric	میٹرک
iii. Intermediate	انٹرمیڈیٹ
iv. Graduate	گریجویٹ
v. 18 years or more	18 سال
4.Income	4.آمدنی
i. Less than 20,000	20,000سے کم
ii. 20,000 - 50,000	20,000-50,000
iii. 50,000-100,000	50,000-100,000
iv. More than 100,000	100,000سے زیادہ
5.Occupation	5.پیشہ
i. Government service	سروس سرکاری
ii. Private Service	سروس نجی
iii. Unemployed	بے روزگار
iv. Housewife	گھریلو خاتون
6.Marital Status	6. ازدواجی حیثیت
i. Unmarried	غیر شادی شدہ
ii. Married	شادی شدہ
iii. Separated/divorced	علیحدگی/ طلاق شدہ
iv. Widow	بیوہ
7.Living Arrangement	7. رہنے کاانتظام
i. Alone	تنہا
ii. With spouse	شریک حیات کےساتھ
iii. With children	بچوں کےساتھ
iv. With spouse and children	بچوں + شریک حیات کےساتھ
8. History of tobacco use	8. تمباکوکااستعمال
i. Cigarrete	سگریٹ
ii. Paan	پان
iii. Betelnut	سپاری
iv. Gutka	گھٹکا
v. None	کوئی نہیں

9. History of chronic illness

i. Diabetes
ii. Heart disease
iii. Gastrointestinal disease
iv. Others(respiratory disease,cancer etc)
v. Multiple
vi. None

9. دائمی بیماری

ذیابیطس ☐
دل☐ کی بیماری
معدے کی☐بیماریاں
(کینسر ، سانس کی بیماری وغیرہ)
دیگر
کوئی نہیں ☐

SECTION II

10.Number of Decayed teeth ?----------

10- دانت بوسیدہ کتنے ہیں ----------

11. Number of missing/extracted teeth?--------

11-غائب یا نکالے گئے دانت کتنے ہیں؟ ---------

12. Number of filled teeth?----------

12- دانت بھرے کتنے کے ہیں؟

SECTION III

1.Has your dental condition or treatment caused you pain or discomfort in the past one month ?

0-Never
1-Rarely
2-Sometimes
3-Often

1. کیا آپ کے دانتوں کی حالت یا علاج کی وجہ سے آپ کو پچھلے مہینے درد یا تکلیف ہوئی؟

0- کبھی-نہیں-
1- شاذ و نادرہی-
2 - کبھی کبھی
3- اکثر

2-Has your dental condition or treatment caused you difficulty in chewing food in the past one month ?

1-Never
3-Rarely
4-Sometimes
3-Often

2. کیا آپ کے دانتوں کی حالت یا علاج کی وجہ سے آپ کو پچھلے مہینے کھانا چباتے میں د شواری ہوئی؟

0- کبھی-نہیں-
1- شاذ و نادرہی-
2 - کبھی کبھی
3- اکثر

3-Has your dental condition or treatment caused you difficulty in swallowing food in the past one month ?

0-Never
1-Rarely
2-Sometimes
3-Often

3. کیا آپ کے دانتوں کی حالت یا علاج کی وجہ سے آپ کو پچھلے مہینے کھانا نگلنے میں د شواری ہوئی؟

0- کبھی-نہیں-
1- شاذ و نادرہی-
2 - کبھی کبھی
3- اکثر

iii. Betelnut
iv. Gutka
v. None

سپاری ☐
گھٹکا☐
کوئی نہیں ☐

9-Has your dental condition or treatment caused you difficulty in smiling in the past one month ?

0-Never
1-Rarely
2-Sometimes
3-Often

9. کیا آپ کے دانتوں کی حالت یا علاج کی وجہ سے آپ کو پچھلے مہینے مسکرانے میں د شواری ہوئی؟

0- کبھی-نہیں۔
1- شاذ و نادرہی۔
2 - کبھی کبھی
3- اکثر

10.Has your dental condition or treatment caused you difficulty in laughing in the past one month ?

0-Never
1-Rarely
2-Sometimes
3-Often

10. کیا آپ کے دانتوں کی حالت یا علاج کی وجہ سے آپ کو پچھلے مہینے ہنسنے میں د شواری ہوئی؟

0- کبھی-نہیں۔
1- شاذ و نادرہی۔
2 - کبھی کبھی
3- اکثر

11.Has your dental condition or treatment caused you embarrassment in the past one month ?

0-Never
1-Rarely
2-Sometimes
3-Often

11. کیا آپ کے دانتوں کی حالت یا علاج کی وجہ سے آپ کو پچھلے مہینے شرمندگی کا سامنا کرنا پڑا ؟

0- کبھی-نہیں۔
1- شاذ و نادرہی۔
2 - کبھی کبھی
3- اکثر

12. Has your dental condition or treatment caused you difficulty with socializing in the past one month ?

0-Never
1-Rarely
2-Sometimes
3-Often

12.دانتوں کی حالت کی وجہ سے پچھلے مہینے آپ کو سماجی ہونے میں د شواری ہوئی؟

0- کبھی-نہیں۔
1- شاذ و نادرہی۔
2 - کبھی کبھی
3- اکثر

13. Has your dental condition or treatment affected your relationship with your family in the past one month ?

0-Never
1-Rarely
2-Sometimes
3-Often

13.کیا آپ کے دانتوں کے علاج یا حالت نے پچھلے مہینے آپ کے خاندان کے ساتھ تعلقات کو متاثر کیا ؟

0- کبھی-نہیں۔
1- شاذ و نادرہی۔
2 - کبھی کبھی
3- اکثر

18.Has your dental condition or treatment affected your socioeconomic status in the past one month ?

0-Never
1-Rarely
2-Sometimes
3-Often

18. کیا آپ کے دانتوں کی حالت یا علاج کی وجہ سے آپ کی پچھلے مہینے سماجی و اقتصادی حیثیت متاثر ہوئی؟

0- کبھی نہیں۔
1- شاذ و نادر ہی۔
2 - کبھی کبھی
3- اکثر

19.Has your dental condition or treatment caused you difficulty in performing religious activities in the past one month ?

0-Never
1-Rarely
2-Sometimes
3-Often

19. کیا آپ کے دانتوں کی حالت یا علاج وجہ سے آپ کو پچھلے مہینے مذہبی سرگرمیاں کرنے میں پریشانی ہوئی؟

0- کبھی نہیں۔
1- شاذ و نادر ہی۔
2 - کبھی کبھی
3- اکثر

20.Has your dental condition or treatment caused you difficulty with work in the past one month ?

0-Never
1-Rarely
2-Sometimes
3-Often

20. کیا آپ کے دانتوں کی حالت یا علاج کی وجہ سے آپ کو پچھلے مہینے کام کرنے میں دشواری ہوئی؟

0- کبھی نہیں۔
1- شاذ و نادر ہی۔
2 - کبھی کبھی
3- اکثر

21.Has your dental condition or treatment caused you little interest or pleasure in doing things ?

0-Never
1-Rarely
2-Sometimes
3-Often

21. کیا آپ کے دانتوں کی حالت یا علاج کی وجہ سے آپ کو پچھلے مہینے کام کرنے میں کم دلچسپی محسوس ہوئی؟

0- کبھی نہیں۔
1- شاذ و نادر ہی۔
2 - کبھی کبھی
3- اکثر

22.Has your dental condition or treatment made you less motivated to do work in the past one month ?

0-Never
1-Rarely
2-Sometimes
3-Often

22. کیا آپ کے دانتوں کی حالت یا علاج کی وجہ سے آپ کو پچھلے مہینے کام کرنے کے لئے کم حوصلہ افزائی محسوس ہوئی؟

0- کبھی-نہیں۔
1- شاذ و نادرہی۔
2 - کبھی کبھی
3- اکثر

23.If you have checked any of the problems above,Has your dental condition made it difficult for you to perform daily life activities in the past one month?

0-Never
1-Rarely
2-Sometimes
3-Often

23. اگر آپ نے کسی بھی مسئلے کی شناخت کی ہے، تو کیا آپ کے دانتوں کے مسئلہ نے آپ کے لیے روزمرہ کی زندگی کی سرگرمیاں انجام دینا مشکل بنا دیا ہے۔

0- کبھی-نہیں۔
1- شاذ و نادرہی۔
2 - کبھی کبھی
3- اکثر

ANNEXURE VI

IRB Letter

AL-SHIFA SCHOOL OF PUBLIC HEALTH
PAKISTAN INSTITUTE OF OPHTHALMOLOGY
AL-SHIFA TRUST, RAWALPINDI

MSPH-IRB/15-10
27th Mar, 2023

TO WHOM IT MAY CONCERN

This is to certify that **Saadia Ayub** D/O **Muhammad Ayub Khan** is a student of Master of Science in Public Health (MSPH) final semester at Al-Shifa School of Public Health, PIO, Al-Shifa Trust Rawalpindi. He/she has to conduct a research project as part of curriculum & compulsory requirement for the award of degree by the Quaid-i-Azam University, Islamabad. His/her research topic, which has already been approved by the Institutional Review Board (IRB), is **"Impact of dental health on the daily living of geriatric population in dental hospitals of Rawalpindi".**

Please provide his/her necessary help and support in completion of the research project. Thank you.

Sincerely,

Dr. Ayesha Babar Kawish
Head
Al-Shifa School of Public Health, PIO
Al-Shifa Trust, Rawalpindi

Brig. Abdur Rehman
I/C OPD
01/6/23

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