Master of Science in Public Health

Assessment of Skin related Quality of Life among University Students of Rawalpindi City

By

(Jazba Tareen)

Al-Shifa School of Public Health, PIO,

Al-Shifa Trust Eye Hospital

Quaid-I-Azam University

Islamabad, Pakistan

(2023)

Assessment of Skin related Quality of Life among University Students of Rawalpindi City

(Jazba Tareen)

(362856-PIO/MSPH-2021)

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

MASTER OF SCIENCE IN PUBLIC HEALTH (2023)

to

Al-Shifa School of Public Health, PIO, Al Shifa Trust Eye Hospital,

Faculty of Medicine

Quaid-i-Azam University, Islamabad

Word Count: 10,760

Declaration

In submitting this dissertation, I certify that I have read and understood the rules and regulations of ASOPH and QAU regarding assessment procedures and offences and formally declare that all work contained within this document is my own apart from properly referenced quotations.

I understand that plagiarism is the use or presentation of any work by others, whether published or not, and can include the work of other candidates. I also understand that any quotation from the published or unpublished works of other persons, including other candidates, must be clearly identified as such by being placed inside quotation marks and a full reference to their source must be provided in proper form.

This dissertation is the result of an independent investigation. Where my work is indebted to others, I have made acknowledgments.

I declare that this work has not been accepted in substance for any other degree, nor is it currently being submitted in candidature for any other degree.

_____ _____

(Ms. Hina Sharif)

Sr. Lecturer Public Health

Al-Shifa School of Public Health,

PIO, Al Shifa Trust Eye Hospital

Date: 15-02-2023

(Jazba Tareen)

(362856-PIO/MSPH-2021)

MSPH (2023)

Date: 15-02-2023

Co-Supervisor:

_____

(Dr. Khizar Nabeel Ali)

Sr. Lecturer Public Health

Dedicated to my dearest father Major Muhammad Yamin Farooq and beloved mother Ms. Fehmida Mir who have been a constant source of encouragement for me in my research work

*I **couldn't** be able to accomplish this task without your **support**…….*

ABSTRACT

Background: Skin diseases being ranked as fourth most common cause of human illness. Skin diseases can affect population of every age group especially adolescents. As, many affected people do not consult a physician and ultimately resulting in an increase among dermatological disorders. Therefore, early detection and treatment can lower the burden of diseases.

Objectives: The present study was conducted to assess skin related quality of life and its association with socio-demographic factors and skin related characteristics among university students studying at public and private institutes of Rawalpindi city.

Methodology: A cross-sectional study was carried out at public and private institutes of Rawalpindi, Pakistan. A total of 330 university students at public and private institutes were selected through multi-stage random sampling. The data was collected through self-administered questionnaire. Assessment of skin related quality of life was done using DLQI (Dermatological life quality index) scale. Pearson Chi-square test of Independence was applied to check the association of socio-demographic factors and skin related questions with DLQI.

Results: Out of 330 respondents, majority were females (n= 172, 52.1%) and were 18-20 years of age (n= 147, 44.5%). Respondents visits to clinic each year were recorded as once a year (n= 67, 20.3%), twice a year (n=66, 20.0%) and who never had a visit to skin clinic were (n=137, 41.5%). DLQI score showing very and extremely large effect on respondent's quality of life were (63.3%), those having moderate effect were (20.3%), those with small and no effect at all were (16.4%). DLQI had a significant association with age of respondent, gender, institute of respondent, pocket money and type of living of respondent ($p \leq 0.05$). DLQI also showed

significant association with respondent's skin problems, family skin issues, perceived respondent confidence level in general, number of visits to skin clinic, reasons for visiting skin clinic, healthy skin diets, use of skin cream, knowledge about harmful skin products and preference for skin products regarding price ($p \leq 0.005$).

Conclusion: The study concluded that skin related QOL of most respondents were very and extremely largely affected. The study revealed more worst quality of life among males than females, mostly of age group 21-23 years and respondents from low-socio-economic background. Mostly respondents were having positive family history of skin diseases. Respondents also reported a lot of problems in daily routine activities due to skin related issues.

Key Words: Assessment, Quality of life, Dermatological Life Quality Index, University students.

ACKNOWLEDGMENTS

In the name of Allah, the most Merciful and Beneficent

First of all, I am thankful to Allah Almighty, the most merciful and beneficent, for making the journey of my life till this point, including the completion of my thesis, which is a blessing indeed.

My utmost gratitude to my thesis supervisor**, Ms. Hina Sharif**, without her expertise and guidance this would not have been possible. In spite of her busiest and tiring routine, she had always provided me with her adroit guidance and worthy suggestions throughout this time.

I would like to thank all my teachers who furthered my early and professional development during my education life respectable HOD **Dr. Ayesha Babar Kawish** for her guidance throughout this journey.

I would also like to pay my gratitude to the university administration and staff of all universities for providing the necessary help during the data collection phase. My deepest gratitude to the students who had spared their precious time and provided me required information for the completion of my study.

I owe my supreme gratitude towards my parents for their unconditional love and support for me. My father Major Muhammad Yamin Farooq, my mother Fehmida Mir, my brother M. Faseeh, my sisters Ajla and Malaika have always supported me in each and every phase of the life. Whatever I am and wherever I am, is just because of the selfless love of my parents. Their prayers and best wishes have made me strong enough to face every problem and difficulty of the life. They have and they still do fulfill each and every of my wishes.

I would also like to extend my gratitude to my dearest friends, who owe me a big time for their support throughout my research work. I humbly thanks to all the persons who have supported me in this regard.

Table of Content

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AAD	American Academy of Dermatology
AD	Atopic Dermatitis
CADI	Cardiff acne disability index
DLQI	Dermatological Life Quality Index
FJWU	Fatima Jinnah Women University
GBD	Global Burden of Diseases
GAGS	Global acne grading system
HRQOL	Health related quality of Life
IRB	Institutional Review Board
PIO	Pakistan Institute of Ophthalmology
QOL	Quality of Life
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

We live in a society where most importance is given to physical appearance and looks. There are multiple forces like internet, social media, and cosmetic industries which through advertisements have conspired to focus on good appearance and produced an unprecedent level of dissatisfaction, anxiety and worry among different parts of the population. To a greater extent we internalize to reduce the difference between our appearance and those ideals with a believe that it will enhance our relationships, social life and occupational accomplishments (Rumsey, 2018).

Different global cultures and societies places an importance to physical appearance, esthetics and pigmentation. Any condition that can affect appearance and outer look can result in demoralization, low self-esteem, lesser opportunities and often less upward societal mobility (Grimes & Miller, 2018). The lower self-esteem and feeling of being ugly has been described in patients of cutaneous diseases that ranges from acne to alopecia areata to vitiligo. Skin related issues can have a greater impact on quality of life effecting an individual personal life, career and social relations.

World Health Organization adopted the quality of life as it is not purely the absence of disease but the capacity of a person to lead a productive and pleasing life. Lesions in visible areas of skin can cause emotional discomfort, embarrassment, low self-confidence, sorrow and social isolation. These alterations can also lead to different psychiatric disorders like depression, anxiety and even suicidal thoughts affecting patient health state and quality of life. Skin can be affected by different diseases of idiopathic and genetic origins that can be severe or disabling (Cortés et al., 2022). According to a biological perspective skin and brain are interrelated as they originate from same

germ layer. Therefore, it is possible to speculate that excessive damage to the skin could be related to occurrence of mental disturbance.

Skin being the largest organ of the body. It is a protective layer which helps to maintain the body temperature and serves as a natural filtrate. Skin is affected at every age group of life. Skin infection rank fourth among ten most prevalent diseases. Individuals mostly affected by skin diseases are acne, warts, scars and pigment changes and almost every individual experience it at least once in a lifetime. Environmental factors such as dust, unhygienic conditions and overcrowding usually result in different cutaneous disorders. The occurrence and pattern of different dermatological diseases varies according to geography, between countries and even in different parts of the same country (Rahamathulla, 2019).

Skin diseases are common and had a significant impact on quality of life, productivity and mental health. Global burden of diseases (GBD) found skin diseases on rank four as major (non-fatal) cause of disability. Though, the impact of skin diseases is even more considerable in lower socioeconomic populations with limited access and availability of health care and an agriculture economy (Wootton et al., 2018).

An individual observation of his or her quality of life is influenced by the person's physical health, psychological conditions, independency, social relationships, personal beliefs and relationship to his or her environment(Farage et al., 2012). Quality of life is simple but complex paradigm among philosophers, sociologists, psychologists, economists and clinicians all having different perception of it. Skin changes vary from adults to older age group i.e., acne to thin and dry skin, age spots, wrinkles and prominent veins etc. Such changes are categorized as age related changes or photoaging.

Skin diseases and especially acne affect almost 80% of the adolescent's population. Epidemiological studies are helpful tools to identify risk factors in the community that affect social and psychological functioning and in order to quantify skin related disorders and its affect upon the quality of life of individuals. Measurement of quality of life is also essential when evaluating new therapies in audit for clinical services. Assessment of the impact on quality of life, risk factors and preferences for the selection of treatment agents may help to design more targeted interventions. The relationship between skin related quality of life and emotional distress are poorly understood and rather controversial (Tasoula et al., 2012).

Aman et al conducted a study that there has been a rise in dermatological disorders in South East Asian Region As skin diseases are dominant in developing regions ranges from mild acne to severe skin disorders like Stevenson Johnson syndrome, toxic epidermal necrolysis and purpura fulminans. However, skin diseases vary according to demography of the countries. Skin diseases usually result in upper morbidity but less mortality. Early treatment of skin diseases is important as it results not only in better outcome but also helps in prevention of communicable diseases. However, improved sanitation, educating the public and good awareness, cleanliness of environment and a good diet can obviously play a greater role in reducing the burden of skin disorders (Aman et al., 2017).

Skin diseases such as alopecia which is most common type of hair loss. As hair is a social construct strongly related to a person identity. Alopecia occurs due to multiple genetic factors. It is characterized by continuous recession of the frontal hairline followed extremely thin hairs or baldness in men while in females it can be recognized by diffuse hair thinning in the vertex scalp (Library, 2021). It is more common among the European American men and United States and has mild effect among women and Asian individuals.

Skin disorder can have an impact on quality of life. Acne vulgaris also known as simply acne is eighth most common diseases in the world effecting 9.4% of the population. It can affect people of all age groups but mostly on peak in between 16-20 years of age group. There are multiple causes of acne that are due to increase sebum, bacterial colonization of the follicles and genetic as well as non-genetic factors can contribute to it (Duru & Örsal, 2021). As acne being one of the most common cutaneous disorders affect the physical appearance and psychological conditions. Self-management is often the first step taken by individuals using facial cleaners, peeling agents and different creams. Others measure include intake of more water, apply other topical ointments and squeezing of acne lesions (M. et al., 2015).

Melasma another chronic skin disease is the most common cause of hyperpigmentation, is characterized by light to dark and irregular patches on face mainly occurring on cheeks, forehead, chin, upper lip and nose. It occurs mostly due to sun exposure and majority of melasma patients are women. It can occur due to multiple factors like ultraviolet rays, hormonal therapy, genetic background, pregnancy, thyroid infections or cosmetics and medications containing phototoxic substances. It is more common among Hispanic, Asian and Latin Americans due to receiving high intensity of UV radiations (Ikino et al., 2015).

Acne being a chronic inflammatory skin diseases effect the face and scrutinized body part and mostly occur in phase of life where a person is utmost body conscious and sensible about their appearance and here moderate to severe acne can lead to mental instability. Psychological comorbidity can be measured only using perceptible tools like various life quality catalogues. Measurement of QOL changes gives insight into the impact of acne from a patient's perspective and can also be a measure of treatment success (Chowdary et al., 2018). Acne is a chronic dermatological disease characterized by inflammatory changes in the pilosebaceous glands of skin

resulting in the formation of comedones, pustules, papules, nodules and cysts. The bacterium mostly associated with it is Cutibacterium acnes (formerly Propionibacterium acnes) and its prevalence is around 5% in Pakistan. A comparison between both genders revealed a greater psychological impact on females than males. It can also result in permanent facial scars (Babar & Mobeen, 2019).

Adolescence is a transitional phase of life resulting in endocrinal changes and mental growth resulting in emotional changes among young people. Approaching towards puberty, young people become more conscious about their looks, physical appearance and afraid of being judged resulting in lack of self confidence and self-esteem. At this age group mostly their personality and attitudes are transferred to their own imaginary world and mental thinking (Haroon et al., 2019). Acne has a greater social impact on quality of life that is approximately equal to patients with other chronic diseases like diabetes, asthma, epilepsy, back pain or arthritis. Mild form of skin related issues can have a devastating effect on psychological health. However, studies have suggested that effective acne treatment can result in better quality of life and reduced depression.

Etiology and causes of skin diseases had a close connection between individual's health and socio-culture environment. Skin ailments and infectious dermatological diseases are particularly present in tropical areas of the world. Skin diseases attributes 34% of all the ailments and most common disease among rural areas. Skin diseases have also gained attention in recent years due to its association with HIV/AIDS. Majority of HIV patients are reported with mucosal or skin problems at certain phase of the disease. Skin ailments such as boils, ringworms, skin disorders, leprosy, eczema, scabies, skin allergy etc. are caused by different microorganisms. However, most of plants used for treatment of skin disorders also have other additional properties i.e., anti-inflammatory, anti-microbial, anti-viral and analgesic effects that requires pharmacological verification. As in

Pakistan the number of people affecting by skin disorders increasing every year. As modern medicines are quite expensive along with treatment therefore mostly people prefer self-management or herbal approached at the initial phase. Currently the ministry of public health of Pakistan is also promoting the use of therapeutical herbs in health system. Awareness and health education regarding uses of different herb and botanical medications are needed as about 80% of population in Pakistan has an easy access to medicinal plants but the use of appropriate herbs is essential as there is diversity of therapeutic flora used for treatment of skin diseases by people (Malik et al., 2019).

1.1. Rationale:

Skin is the largest organ of the body. Skin diseases are common and can affect people of every age group. Skin diseases are increasing day by day in today's world and vary geographical vise. Environment can also have an effect on the different types of skin disorders i.e., hygiene, sanitation and crowding. Presence of bruises on visible area of the skin may cause emotional damage, stress, social discomfort, low self-esteem and embarrassment (Cortés et al., 2022). As in today era people are more conscious about their physical appearance and especially young people. Therefore, any kind of skin disorder can ultimately have an impact on psychological well-being. As, this is the future workforce therefore, their mental stability and self-confidence is of greater concern.

Globally, many studies are conducted concerning skin related quality of life among students. In Pakistan studies are conducting regarding specific skin issue or among patients but there is a paucity of literature regarding skin related quality of life and among youngsters. Therefore, this study aims at identifying the quality of life effected due to skin related issues among university students. Present study will also help to evaluate the skin related quality of life and its association with various socio-demographic factors.

1.2. Objectives:

1. To assess skin related quality of life among university students in Rawalpindi city.
2. To find out association of demographics with skin related quality of life.
3. To find out association of skin related quality of life with skin related characteristics.

CHAPTER 2: LITERATURE REVIEW

Skin diseases are increasing to a greater extent in today's world and is the major factor associated with physical appearance. It can impact both physical and mental health but if managed timely can lessen the effect of such diseases. Many studies have been conducted worldwide, to find out its causative factors, complications related to skin diseases as well as awareness level among people regarding skin care. A review of related international as well as national literature has been conducted to highlight major findings in previous studies.

2.1. Quality of life in individuals with skin related issues:

Henry W. Lim et al carried out a study in 2016 to assess burden of skin diseases in the United States. American academy of dermatology (AAD) develops a burden of skin diseases (BSD) report according to which skin diseases were classified into 24 groups. These diseases included acne, actinic damage, atopic dermatitis, non-cancerous skin growths, bullous diseases, congenital abnormalities, connective tissue disorders, contact dermatitis, cutaneous infections, cutaneous lymphoma, drug eruptions, hair and nail disorders, HPV/warts/molluscum, melanoma, non-melanoma skin cancer, pruritis, psoriasis, rosacea, seborrheic dermatitis, ulcers, urticaria, viral and fungal diseases, vitiligo, wounds and burns. Prevalence in this report refers to portion of population having at least one of these disease on health insurance claim. Nearly, 85 million Americans i.e., (27%) of population (1 in 4 individuals) were checked out for skin disorders. The average of overall affected individuals was 1.6 for skin diseases. Skin diseases were (34%) in age group between 18 to 44 years and prevalence increased by (49.4%) for age group 65 and older. It was estimated that skin diseases caused 22,953 deaths (0.9% of total deaths) (Hodge et al., 2017).

Andac Salman et al carried out a cross-sectional controlled study to evaluate the social anxiety level with severity of disease and quality of life in vitiligo and acne patients in 2016 in Switzerland. Patients were selected from dermatology department and included 37 vitiligo, 37 acne patients and 74 age and gender matched healthy controls having age group above 18 years. The questionnaires used were Liebowitz Social Anxiety Scale (LSAS), Hospital anxiety and depression scale (HADS) and Dermatology life quality index (DLQI). Kolmogorov-Smirnov test was used to assess normality of distribution for variables. Pearson's correlation was used for finding association between variables while chi-square test and student t-test were used to analyze differences between independent samples. This study showed that anxiety and depression in vitiligo and acne patients were significantly higher than healthy control groups ($p < 0.05$) (Salman et al., 2016).

Tetiana Pochnok et al conducted a study to assess health related quality of life (HRQOL) among school and university students with acne at Ukraine in 2017. It included 159 students from university and 99 students from schools. Quality of life with acne was assessed using Cardiff Acne Disability Index (CADI). The score ranges from 0-15 in the questionnaire. The higher the score indicates more impaired quality of life. T-test and correlation were used to analyze the data. Findings showed that impact of acne on QOL among university students were significantly higher (3.33 ± 2.26 and 2.76 ± 2.42, $p < 0.05$). However its also revealed that the impact was much higher in females students (3.59 ± 2.20 in females and 2.55 ± 2.31 in males, $p < 0.01$) which indicates that young female university students had greater effect on QOL due to acne than males (Pochynok et al., 2018).

Jerome Kaikati et al carried out an observational prospective study in 2020 to find out impact of acne treatment on quality of life and self-esteem. A total of 62 respondents were included in the study. The tools used in study were Cardiff acne disability index (CADI), Dermatology life quality

index (DLQI) and Rosenberg self-esteem scale. Among the respondents 79% were female and 61.3% had moderate acne. Scores were compared using independent t-test. Study demonstrated the equivalence between acne treatments in improving QOL and identified the social obstacle created by acne and is on peak in the subgroup of women of child bearing age (Kaikati et al., 2021).

Kamilla Koszoro et al conducted a cross-sectional survey between 2018 to 2021 to evaluate the general and specific health related quality of life among individuals with atopic dermatitis (AD) during the pandemic at Hungary. A total sample of 218 adults were included. General and specific HRQOL among atopic dermatitis individuals were measured using Dermatology life quality index (DLQI) and DLQI-Relevant (DLQI-R). Independent t-test and Mann-Whitney U test, Fischer exact test, multivariant linear regression and ordinal logit regression were performed for analyzing the data. Results indicate that individuals with atopic dermatitis experienced significantly more problem in some areas of HRQOL (Koszorú et al., 2022).

L.Lukaviciute et al carried out a study on quality of life, anxiety prevalence, depression symptomology and suicidal Ideation among acne patients in Lithuania. It included a sample of 255 patients. Mental health with acne was assessed using anxiety and depression scale, DLQI and questions about characteristics of acne. Discrete variables were compared using chi-square test of significance while normally distributed continuous variables were compared using student's t-test and abnormal distribution was compared using Mann-Whitney-Wilcoxon rank sum test. The findings revealed that (38.4%) patients had anxiety symptoms, (23.1%) had depression symptoms and (12.9%) had suicidal thoughts. Overall, (96.5%) of respondents had reduced quality of life (Life et al., n.d.).

2.2. Prevalence of Different Skin Diseases:

Kholoud Tayel et al carried out a cross-sectional study on acne vulagris prevalence, severity and impact on quality of life and self-esteem among Egyptian adolescents in 2020. A total of 787 students were included in this study. Multistage stratified random sampling was used. Data was collected through Global acne grading system (GAGS), Cardiff acne disability index (CADI), Coopersmith self-esteem scale and also through clinical examination. Chi-square test ad Pearson correlation were used for data analysis. Prevalence of self-reported acne was (34.7%) and significantly higher in females than males (39.1% vs 30.3% p=0.009). Prevalence of clinically confirmed acne was (24.4%) with high rates among females (28.6%). Majority of students had mild acne (75.5%) and (11.4%) had severe disability. Low self-esteem was also reported more among females (p= 0.004) (Tayel et al., 2020).

Ayesha Omalara Akinkugbe et al conducted a cross-sectional survey at rural community in Lagos State, Nigeria. Data was obtained through self-reported questionnaire administered by face-to-face interview. It included 263 respondents among them 156 were adults and 107 were children. Chi-square test was used for categorical variables while mean ± standard deviation (SD) was used for continuous variables. The skin disorders founded among adults were infection (7.6%), disorders of sebaceous glands (3.2%), pigmentary disorders (1.2%) and pruritis (0.6%). While in children it was reported as skin infections (19.6%), eczema (1.8%) and sebaceous gland disorder. Majority of skin disorder among children were due to fungal causes (Akinkugbe et al., n.d.).

Chandana S. Thatikonda et al carried a study in order to compare the skin disorders of elder age group and those of middle age group in India. It included 1300 i.e., 650 elderly and 650 middle age group respondents. Non-probability consecutive sampling was used. The findings revealed that pruritis was main complaint among both elderly (63.7%) and middle age group (61.8%).

Among elderly most common skin disorders were infections (26.6%), eczema (21.3%), xerosis (17%), papulosquamous disorders (15.1%) and allergic dermatitis (7.5%). While those in middle age group most common skin disorders were infections (26.3%), papulosquamous disorders (20.2%), eczema (17.7%), urticaria (11.2%), xerosis (10.3%) and allergic dermatitis (9.7%) (Thatikonda et al., 2021).

2.3. Risk factors associated with Skin Disorders:

Kyung Eun Kim et all carried out a study to find adverse effects of airborne particulate matter on different cutaneous disorders. It focused on to find association between particulate matters (PM) and skin diseases. Recent epidemiological studies showed the effect of particulate matters on skin growth and exacerbation. According to this study, PM persuades oxidative stress via production of reactive oxygen species and secretion of pro-inflammatory cytokines such as TNF-α, IL-1α and IL-8. PM exposure also results in degradation of collagen. Cigarette smoke associated with androgenetic alopecia while ultrafine particles enhance the risk of skin cancer. Overall, results concluded that PM levels are associated with various skin diseases (Kim et al., 2016).

Williams Agyemang-Duah et al conducted a cross-sectional study to find the prevalence and patterns of skin toning practices and factors which enhance them towards the use of skin toning practices at Ghana. A total of 389 undergraduate female students were included in this study. The questionnaire used was closed ended comprised of two parts i.e., socio-demographics and prevalence and pattern of skin toning practices. Univariant and multivariant regression was used. The study revealed that (40.9%) of respondents had practiced skin toning during the last 12 months. It showed that (51.3%) of respondents were using skin toning products like creams (38.9%) and soap or gel (35.5%). Respondents aged 21 years were more likely to use skin toning products (AOR = 0.400, CI 0.121–1.320), those who had dark skin (AOR = 3.287, CI 1.503–

7.187), attended public school (AOR = 1.9, CI 1.1–3.56) and those who attended girls' school were more likely to use skin toning products (AOR = 10.764, CI 4.2–27.3). Furthermore, those who were in level 400 (AOR = 49.327, CI 8.48–286.9) and those receiving more than 500 cedis were also more likely to use skin toning products (AOR = 2.118, CI 0.419–10.703) (Duah et al., 2019).

Faiz Ali et al carried out a study to find association of various risk factors associated with acne vulgaris infection at Quetta. It included a total of 1000 subjects. Data was analyzed using Minitab, Crosstab, Pearson Chi Square test and analysis of variance. Study determined prevalence of Acne vulgaris according to different variables i.e., age, gender, skin type, marital status and use of food. Results showed that prevalence of acne was significantly higher among females (64%, CI, 59.4-69.8), teenagers (65%, CI, 60.5-70.8), oily skin type (70%, CI, 65.5-75.6), pre-menstrual flare (24%, CI, 19.7-29.8) and unmarried subjects (80%, CI, 75.4-85.8). However, the study also revealed multiple risk factors associated with acne are consumption of spicy food, oily skin type and females having disturbed menstrual cycle (Ali et al., 2019).

2.4. Conceptual Framework:

Based on the previous literature, a conceptual framework of the present study was developed that highlight the different skin disorders and risk factors associated with skin related quality of life.

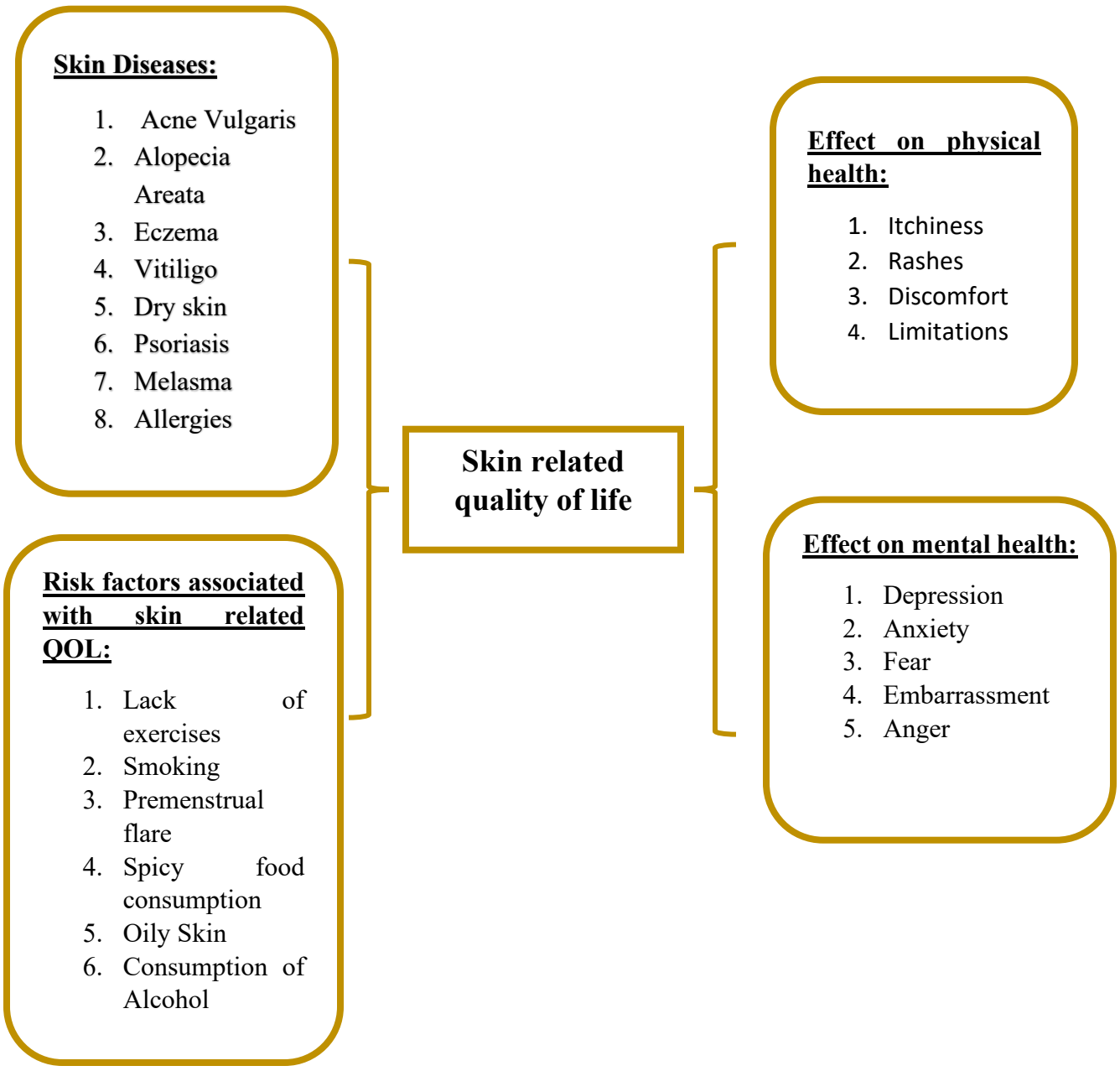


Figure 1: Conceptual Framework of Skin Related Quality of Life

2.5. Operational Definitions:

1. **Assessment:**

   It is the act or an instance of evaluating and making a judgement about something

2. **Quality of life:**

   WHO has defined QOL as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (Eltaher & Araby, 2015).

3. **Dermatological Life Quality Index:**

   It is a validated health related quality of life instrument which is used to study different dermatological skin disorders. It compromised of 10 items measuring QOL from perspective of dermatological disorders. Responses are recorded on a scale of 0 (not at all) to 3 (very much) with higher scores reflecting greater perceived impairment (Rhee et al., 2004).

4. **University Students:**

   University students are defined as individuals between 18 to 25 years of age.

CHAPTER III: METHODOLOGY

3.1. Research Design:

A quantitative research approach using cross-sectional study design was used for the current study.

3.2. Research Duration:

Study period for current research was six months (September to February 2023).

3.3. Study Setting:

The study was carried out at public and private universities of Rawalpindi City. The universities included Fatima Jinnah Women University (FJWU), Arid Agriculture University, Pakistan Institute of Ophthalmology (PIO), Fauji Foundation University.

3.4. Research Participants:

Study subjects were university students selected on the basis of inclusion and exclusion criteria.

3.4.1. Inclusion Criteria:

1. Bachelor's students (Both hostilities and day-scholars).
2. Both male and female.
3. Students having age group 18-26 years.

3.4.2. Exclusion Criteria:

1. Students who were having co-morbidities.
2. Students who did not experience any skin issue.

3.5. Sample Size Calculation:

Sample size was calculated using proportion formula for sample size calculation in Open Epi Menu, Version 3.01 software. Previous prevalence of low effect on skin related quality of life among students was taken as 30% as reported by a study conducted on female undergraduate medical students at Rawalpindi and Islamabad (Babar & Mobeen, 2019). Calculated sample size was 330 with 95% confidence interval (C.I) and 5% margin of error.

3.6. Sampling Strategy:

Desired sample size was collected using probability multistage random sampling.

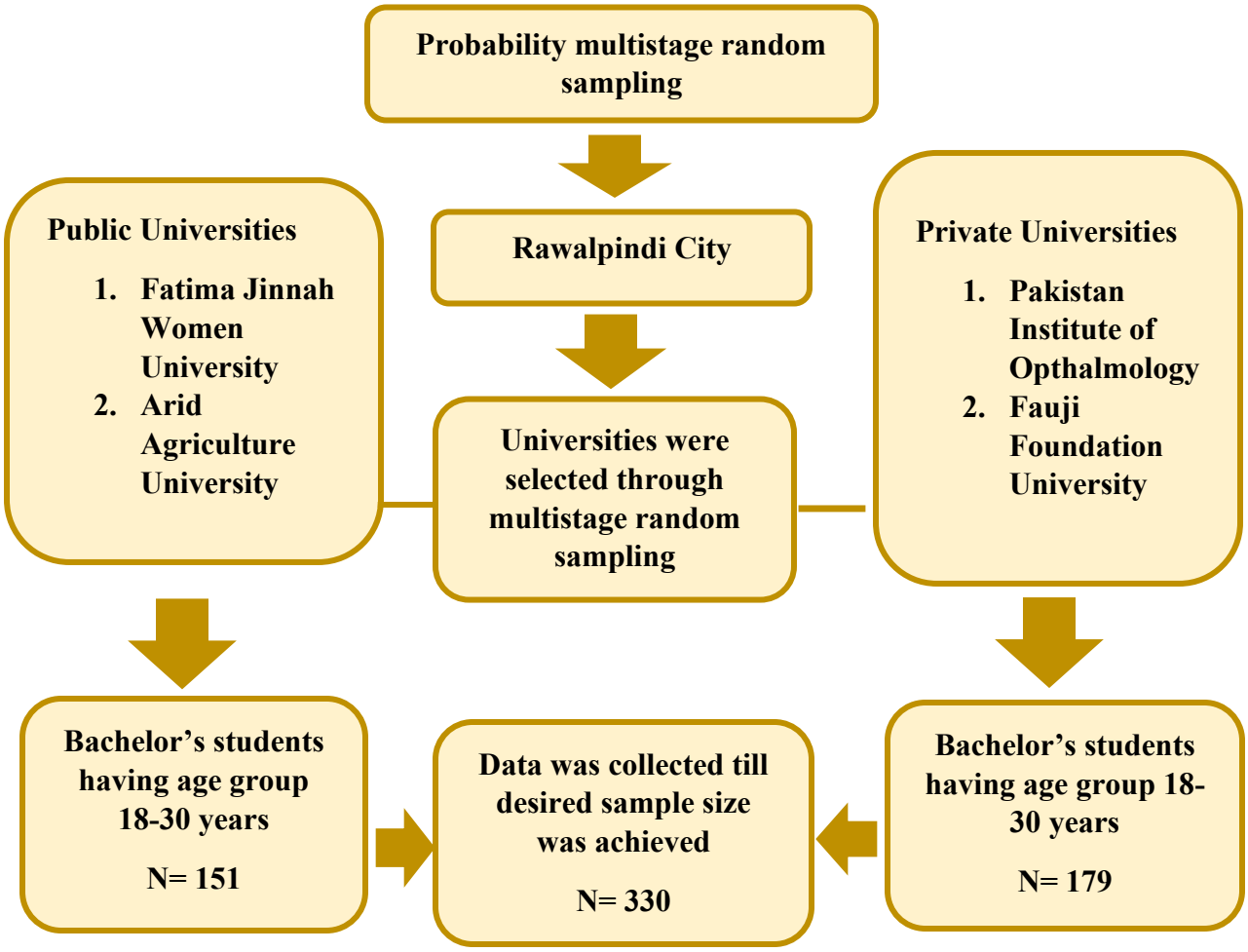


Figure 2: Probability Multistage Random Sampling

3.7. Data Collection Instrument:

3.7.1. Questionnaire Design:

Data was collected through a self-reported questionnaire. A Performa was developed to collect data regarding socio-demographic characters of students, skin related questions and skin related quality of life**.** Questionnaire is attached in Annexure-I.

3.7.2. Content of the questionnaire:

The questionnaire contained three major sections:

1. **First part** included questions related to socio-demographic data, including, age group, gender, residency, family type, pocket money, type of living, monthly income and number of siblings etc.
2. **Second part** included skin related characteristics. It comprised of 14 items.
3. **Third part** included assessment of skin related quality of life which was calculated using Dermatological life Quality index. It is a broad, self-administered, dermatology specific questionnaire that measures the impact of skin diseases on health-related quality of life in patients. It covers six domains (symptoms, feelings, routine daily activities, sports activities, work and school, personal relationships, and treatment). It included a total of 10 items.

3.7.3. Study Variables:

3.7.3.1. Outcome variable:

The major construct of the questionnaire was to assess skin related quality of life among university students. The outcome variable was skin related quality of life which was measured by using a validated tool i.e., DLQI. It consists of 10-items graded on a five-

point Likert scale from 0= not at all and not relevant, 1= a little, 2= A lot and 3= very much. DLQI is calculated by summing the score of each question resulting in a maximum of 30 and a minimum of 0. The meaning of DLQI scores is interpreted as 0 to 5 (no and small effect at all), 6 to 10 (moderate effect), 11 to 30 (very and extremely large effect). The higher the score, the more quality of life is impaired.

3.7.3.2. Independent variables:

Data on independent variables was collected through a structured Performa that is constructed after international and national literature review. The Performa included socio-demographic variables such as age, gender, residency, family type, pocket money and number of siblings etc. In addition to these it also included questions like type of living i.e., days scholars or hostilities and the type of institute in which they are studying.

3.8. Data Collection Process:

3.8.1. Pilot Testing:

Pilot testing was performed before starting the formal data collection procedure by including 10% of the actual sample size. Performa was tested for any future changes; no major changes were done after pilot testing. Two questions were changed from open ended to close ended in socio demographic section. Data from pilot testing was not included in final analysis. Pilot testing showed the reliability of tool was 0.735 (26 items).

3.8.2. Formal Data Collection:

Data was collected through self-administered questionnaire and no data collectors were hired. Bachelor's students of public and private universities were approached. Consent was taken orally from all participants and only those were selected who agreed to take part in

the research process. After taking the consent, the participants were given self-administered questionnaire and their responses were recorded by the researcher. Data collection was completed in approximately two months. All filled questionnaires were kept protected in plastic files and no one had access to it other than researcher.

3.9. Data Analysis Procedure:

Code book was developed and data was entered in Statistical Package for Social Sciences (SPSS) Version 26. After careful data entry, data was check for any error before proceeding to the 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. A P-value of ≤ 0.05 was considered significant.

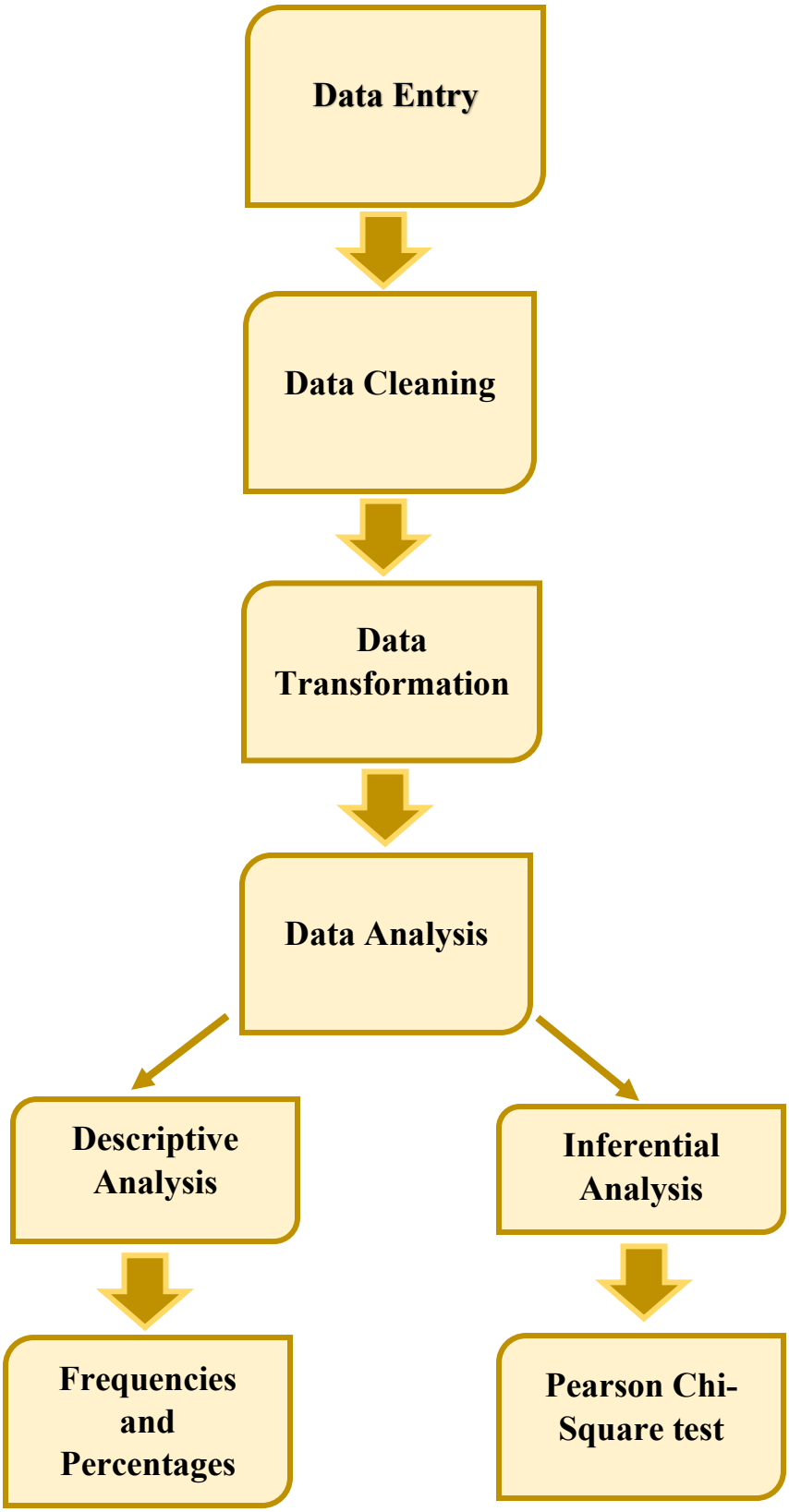


Figure 3: Data Analysis Plan

3.9.1. Data Transformation:

Number of siblings were transformed into categorical variable upon entering in SPSS. DLQI was also computed and was categorized into no and small effect at all (cut-off points 1-5), moderate effect (cut-off points 6-10), large and extremely large effect (cut-off points 11-30) and was compared with socio-demographic variables and respondent's skin related question.

3.9.2. Descriptive Analysis:

Descriptive statistics were generated for socio-demographic characteristics and outcome variables. For categorical variables, data was summarized in the form of frequencies and percentages and presented in the form of tables, bar chart and pie chart. Codes were assigned in the tool. By adding up the scores, respondents were divided into 5 groups using cut off points as already mentioned in the validated tool. Respondents with score greater were having high effect on their life due to skin issues.

Data analysis was divided into 3 stages:

1. Descriptive was run for socio-demographic variables that were gender, age, pocket money, family structure, type of institute, residency, type of living, monthly family income and number of siblings.
2. Descriptive analysis was run for skin related questions.
3. Descriptive analysis was run for Dermatological Life Quality Index (DLQI).

3.9.3. Inferential Analysis:

In Fourth step Pearson Chi-square test of association was run for demographic variables with computed score of Dermatological Life of Quality Index and was also run to find association of skin related quality of life, DLQI with skin related questions. Fischer Exact test was also

used where the cell count was less than 5. A significant value of $p \leq 0.05$ was used for statistical analysis.

3.10. Ethical Considerations:

Before starting formal data collection, approval from Institutional Review Board (IRB) of Al-Shifa School of Public Health Rawalpindi, Pakistan has been taken (Annexure-4). Permission letter from the Head of Department of Al-Shifa School of Public Health was obtained regarding access to different universities. Permission was taken from all the public and private universities of Rawalpindi City for conducting research. Students were explained the purpose of research and oral consent was taken from each participant (Annexure-3). Participants were assured for the confidentiality of their data. Data collected from respondents was kept anonymous and was not shared with anyone. Data was entered in SPSS anonymously. After data entry, hard copies collected were kept at a safe place.

CHAPTER IV: RESULTS

For the current study, data of 330 students, in public and private universities, was collected. A summary of descriptive and inferential analysis is given below.

4.1. Demographic Characteristics:

A total of 330 students were included in the study. Majority of the respondents were female (n=172, 52.1%) and age of respondents varied mostly between 18-20 years (n=147, 44.5%). Majority of the students were from private universities (n=179, 54.2%). A vast number of students were from main city (n=177,53.6%) and having nuclear family system (n=223, 67.6%). Pocket money of majority students were less than 20,000 (n=219, 66.4%) and a large number of students were living in hostels (n=195, 59.1%). Monthly family income of respondents less than 20,000 were (n=31, 9.4%), between 20,000-40,000 were (n=53, 16.1%) and between 40,000-60,000 were (n=129, 39.1%). Students having siblings 0 to 2 were (n=77, 23.3%) and between 3 to 5 were (n=158, 47.9%). Demographic characteristics of respondents are shown in table 1.

Table 1: Descriptive summary of Socio-Demographic Variables

S. No	Variable	Frequency (n)	Percentage (%)
1.	**Age of Respondent**		
	18-20 years	147	44.5
	21-23 years	135	40.9
	24-26 years	48	14.5
2.	**Gender**		
	Male	158	47.9
	Female	172	52.1
3.	**Family structure**		
	Nuclear	223	67.6
	Joint	107	32.4
4.	**Place of Residence**		
	Main City	177	53.6
	Sub Urban Area	153	46.4
5.	**Pocket money of respondent**		
	Less than 20,000	219	66.4
	20,000 to 40,000	111	33.6
6.	**Monthly family income**		
	Less than 20,000	31	9.4
	21,000-40,000	53	16.1
	41,000-60,000	129	39.1
	More than 60,000	117	35.5
7.	**Number of siblings**		
	0 to 2	77	23.3
	3 to 5	158	47.9
	6 to 9	95	28.8

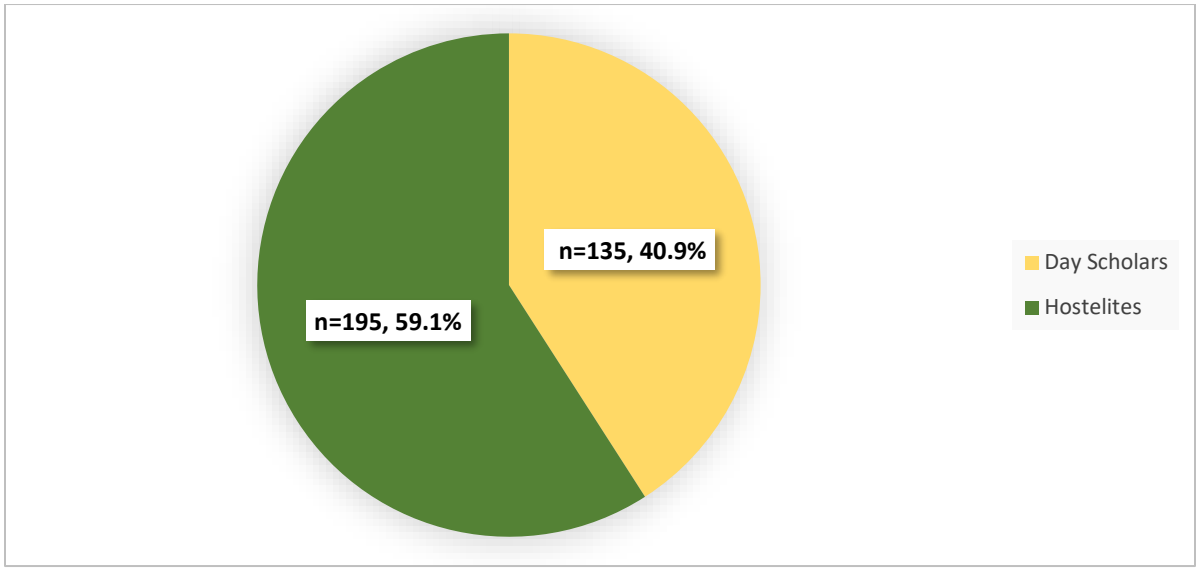


Figure 4: Type of living of the Respondents

Figure showed the percentage and frequency of day scholars (n=135, 40.9%) and that of hostilities were (n=195, 59.1%).

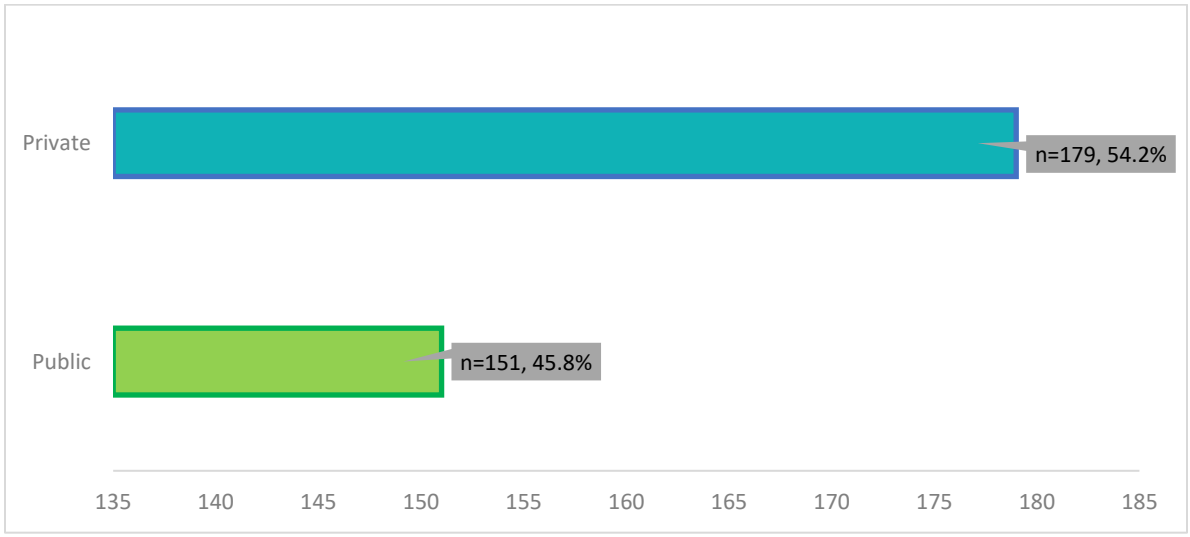


Figure 5: Institute of the Respondents

Figure represents institute of respondents, those studying in private were (n= 179,54.2%) and those studying in public were (n= 151, 45.8%).

4.2. Descriptive Results for Skin related characteristics:

In the current study, results showed that respondent having skin problems were positive among (n=156, 47.3%) and negative among (n=129, 39.1%). Positive family history of skin was (n=161, 48.8%) and negative in (n=169, 51.2%). Respondents having skin knowledge about healthy products were present among (n=212, 64.2%). Reasons for visiting clinic for skin diseases were (n=64, 19.4%), esthetic care (n=53, 16.1%) and laser therapy (n=58, 17.6%). A summary of insight for self-skin of respondents is given below.

Table 2: Frequency and percentage for Skin related characteristics

S. No	Variable	Frequency (n)	Percentage (%)
1.	**Do you think you have skin problems?**		
	No	129	39.1
	Yes	156	47.3
	Don't Know	45	13.6
2.	**Do your family members have skin issue?**		
	No	169	51.2
	Yes	161	48.8
3.	**Do you cover your face when you go outside?**		
	Always	87	26.4
	Sometimes	160	48.5
	Never	83	25.2
4.	**Perceived respondent confidence level in general**		
	High	105	31.8
	Normal	189	57.3
	Low	36	10.9

5.	**Knowledge about healthy skin products**		
	Yes	212	64.2
	No	118	35.8
6.	**Reasons for visiting clinic**		
	Skin Disease	64	19.4
	Esthetic Care	53	16.1
	Laser Therapy	58	17.6
	Others	155	47.0
7.	**Ever concerned about your skin**		
	No	147	44.5
	Yes	83	55.5
8.	**Do you know about healthy skin diet**		
	Yes	204	61.8
	No	126	38.2
9.	**If yes then which one**		
	Fresh Fruits	42	20.6
	Plenty of water	79	38.7
	Vegetables	58	28.4
	Dairy Products	25	12.3
10.	**Knowledge about healthy skin**		
	No	122	37.0
	Yes	208	63.0
11.	**Ever used skin cream**		
	No	180	54.5
	Yes	150	45.5
12.	**Knowledge about harmful skin products**		
	No	160	48.5
	Yes	170	51.5

13.	**Preference for skin products regarding price**		
	No	180	54.5
	Yes	150	45.5
14.	**Preference for skin Products regarding effectiveness**		
	No	152	46.1
	Yes	178	53.9
15.	**Preference for skin products regarding doctor advice**		
	No	140	42.4
	Yes	190	57.6

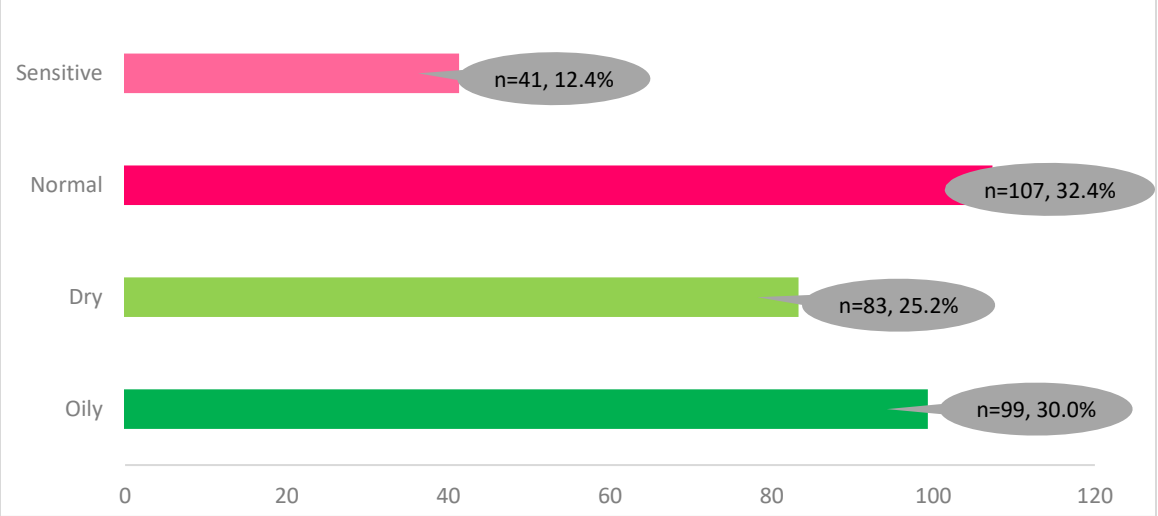


Figure 6: Perceived skin type of Respondents

Figure represents that perceived respondents skin type those who had oily skin were (n=99, 30.0%), with dry skin were (n=83, 25.2%), those having normal skin were (n=107, 32.4%) and the one's with sensitive skin were (n=41, 12.4%).

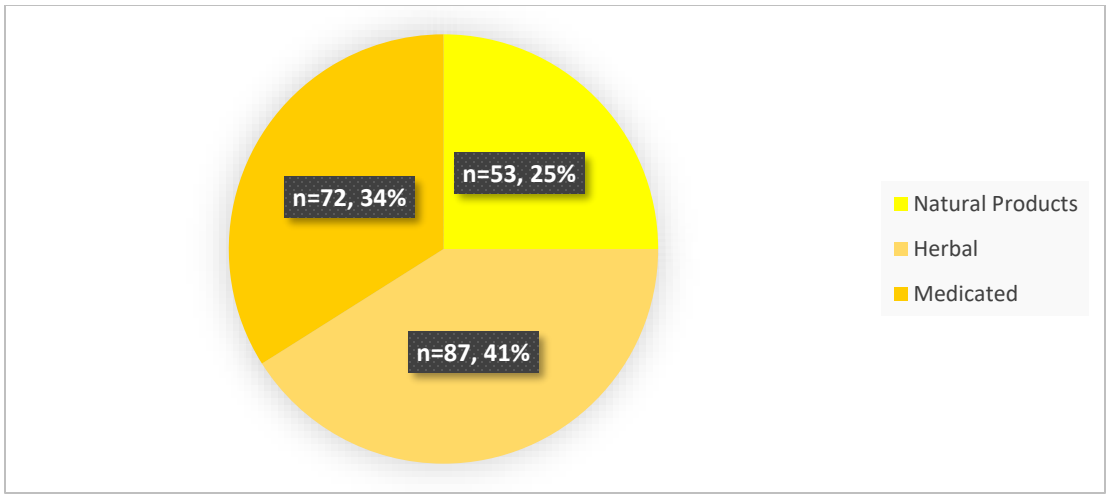


Figure 7: Respondents Knowledge regarding healthy skin products

Figure showed respondents having knowledge regarding natural skin products were (n=53, 25%), knowledge regarding medicated products were (n=72, 34%) and having knowledge about herbal products were (n=87, 41%).

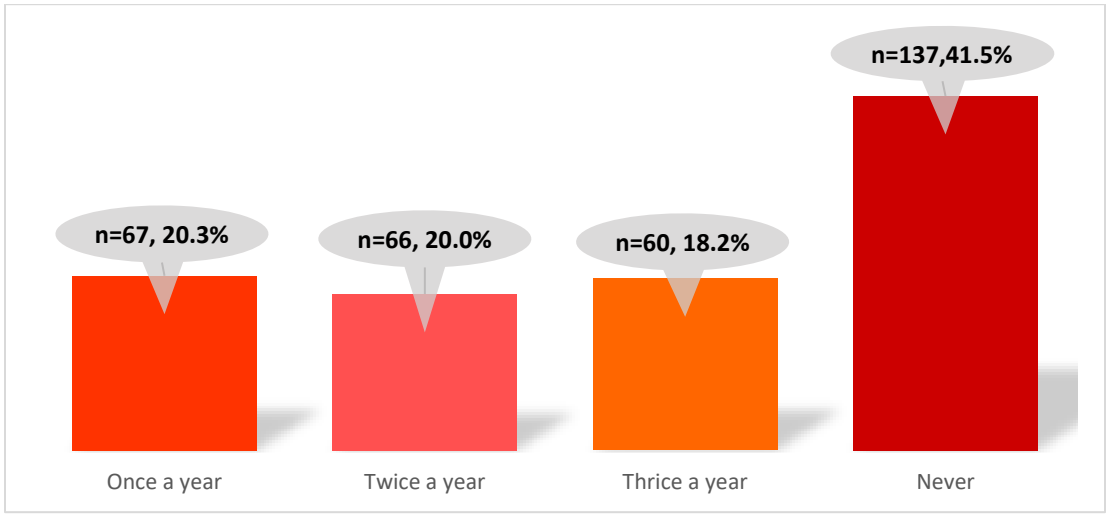


Figure 8: Respondents visits to Skin Clinic

Figure illustrates respondents who had visits to skin clinic once a year were (n=67, 20.3%), twice a year were (n=66, 20.0%), thrice a year were (n=60, 18.2%) and who never had any visit were (n=137, 41.5%).

4.3. Descriptive results for Dermatological Life Quality Index:

In the current study, outcome variable i.e., dermatological life quality index (DLQI) was computed and was further categorized in to no effect at all on respondent's life, small effect on respondent life, moderate effect on respondent life, very large effect on respondent life and extremely large effect on respondent life with options as not relevant, not at all, a little, a lot and very much. A frequency and percentage of Dermatological Life Quality Index is given below.

Table 3: Frequency and Percentage of Dermatological Life Quality Index

S. No	Variables	Frequency (n)	Percentage (%)
1.	**How itchy, sore, painful, stinging has your skin been?**		
	Not at all/Not relevant	122	37.0
	A little	81	24.5
	A lot	69	20.9
	Very much	58	17.6
2.	**How embarrassed or self-conscious have you been because of your skin?**		
	Not at all/Not relevant	119	36.1
	A little	84	25.5
	A lot	75	22.7
	Very much	52	15.8
3.	**How much your skin interfered with you going shopping or looking after your home/garden?**		
		108	32.7
	Not at all/Not relevant	62	18.8
	A little	93	28.2
	A lot	67	20.3
	Very much		

4.	**How much has your skin influenced the clothes you wear?**		
	Not at all/Not relevant	113	34.2
	A little	64	19.4
	A lot	72	21.8
	Very much	81	24.5
5.	**How much has your skin affected any social or leisure activities?**	121	36.7
	Not at all/Not relevant	85	25.8
	A little	56	17.0
	A lot	68	20.6
	Very much		
6.	**How much has your skin made it difficult for you to do any sport?**		
	Not at all/Not relevant	147	44.5
	A little	43	13.0
	A lot	66	20.0
	Very much	74	22.4
7.	**Has your skin prevented you from working or studying?**		
	Not at all/Not relevant	120	36.4
	A little	63	19.1
	A lot	80	24.2
	Very much	67	20.3
8.	**How much of a problem has the treatment for your skin been?**		
	Not at all/Not relevant	108	32.7
	A little	74	22.4
	A lot	76	23.0
	Very much	72	21.8

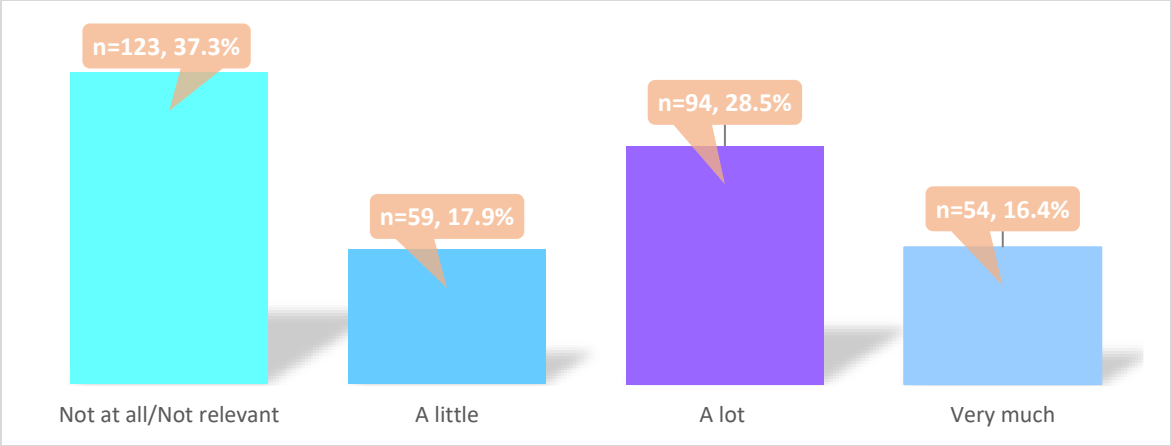


Figure 10: Skin created problems with partner, close friends and relatives

In the DLQI scale, among 330 respondents, those who had not experienced any problem at all due to skin problems with their partner were (n=123, 37.3%), who experience a little were (n=59, 17.9%), who experienced a lot were (n=94, 28.5%) and those with very much were (n=54, 16.4%).

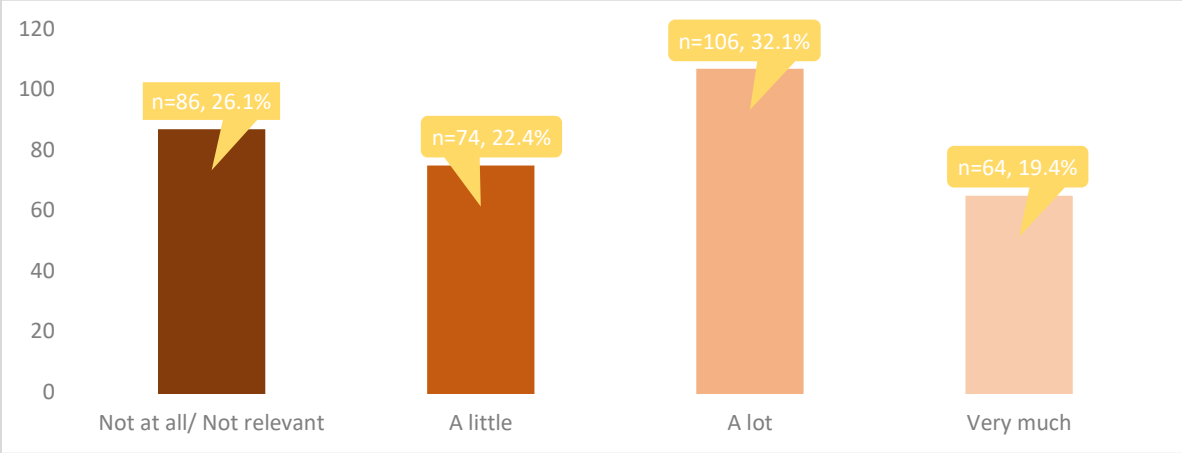


Figure 11: Skin caused problems in daily routine activities

In DLQI scale respondents among whom skin caused problems in their daily routine activities very much were (n=64, 19.4%), a lot (n=106, 32.1%), a little (n=74, 22.4%) and not at all were (n=86, 26.1%).

4.4. Descriptive results for Outcome Variable (DLQI):

In the current study, skin related quality of life was assessed using a tool i.e., Dermatological Life quality index (DLQI). Total score was computed for each type and was further categorized into no and small effect, moderate effect, very and extremely large effect.

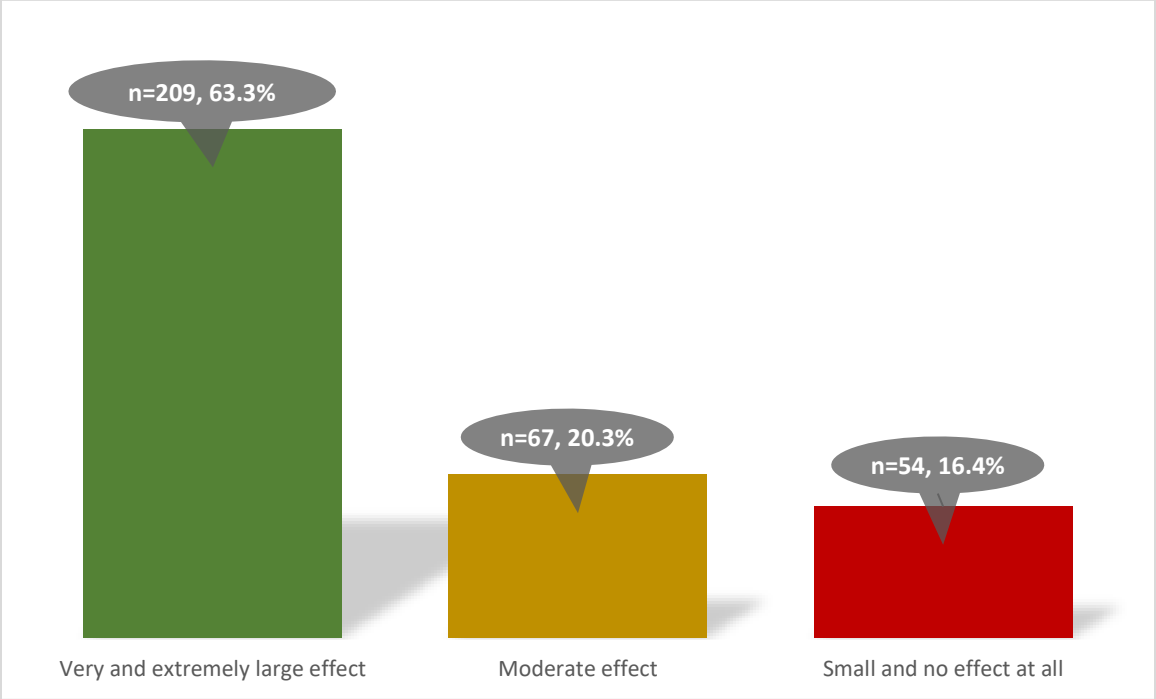


Fig 9: Frequency and Percentage of computed DLQI

Figure illustrates respondents with very and extremely large effect were (n= 209, 63.3%), moderate effect were (n= 67, 20.3%), small and no effect at all were (n=54, 16.4%).

4.5. Inferential Analysis:

4.5.1. Pearson Chi Square Results:

Association of Dermatological life quality index (DLQI) with demographic variables was determined using Pearson Chi Square test of Independence after confirming the assumptions of the test. Association of DLQI was tested independently with socio-demographic variables and respondent insight of self-skin using Chi Square test of Independence. All the p-values below 0.05 were considered statistically significant.

Results of the Chi square test showed that Dermatological life quality index (DLQI) is significantly associated with age of respondent (p=0.001), gender (p=0.001), institute of respondent (p=0.001), pocket money of respondent (p=0.001) and type of living (p=0.001). It was also seen that monthly family income; type of residence and number of siblings also had an effect on DLQI but the results were statistically insignificant (p value> 0.05). A summary of association of socio-demographic characters and DLQI is given in the table below.

Table 4: Association of Dermatological life quality index (DLQI) with Socio-demographic characters

S.No	Variables	No and Small effect at all n (%)	Moderate effect n (%)	Very and Extremely large effect n (%)	Chi-square (df)	P-value
1.	**Age of respondent**					
	18-20 years	25 (18.1)	36 (26.1)	77 (55.8)		
	21-23 years	17 (12.8)	26 (19.5)	90 (67.7)	17.690	**0.001**
	24-26 years	1 (2.1)	5 (10.4)	42 (87.5)	(4)	
2.	**Gender**					
	Male	7 (4.5)	19 (12.1)	131 (83.4)	45.483	**0.001**
	Female	36 (22.2)	48 (29.6)	78 (48.1)	(2)	
3.	**Institute of respondent**					
	Public	16 (10.8)	17 (11.5)	115 (77.7)	19.621	**0.001**
	Private	27 (15.8)	50 (29.2)	94 (55.0)	(2)	
4.	**Family Structure**					
	Nuclear	34 (15.8)	43 (20.0)	138 (64.2)	3.160	0.206
	Joint	9 (8.7)	24 (23.1)	71 (68.3)	(2)	
5.	**Place of Residence**					
	Main City	27 (15.9)	38 (22.4)	105 (61.8)	2.657	0.265
	Sub Urban Area	16 (10.7)	29 (19.5)	104 (69.8)	(2)	
6.	**Pocket money of respondent**					
	Less than 20,000	38 (18.1)	52 (24.8)	120 (57.1)	20.426	**0.001**
	20,000 to 40,000	5 (4.6)	15 (13.8)	89 (81.7)	(2)	

7.	**Type of living**					
	Day scholar	9 (6.8)	17 (12.8)	107 (80.5)	22.730	**0.001**
	Hostilite	34 (18.3)	50 (26.9)	102 (54.8)	(2)	
8.	**Monthly family income**					
	<20,000	3 (9.7)	12 (38.7)	16 (51.6)		
	20,000-40,000	6 (11.3)	13 (24.5)	34 (64.2)	7.530	0.269
	41,000-60,000	18 (14.6)	20 (16.3)	85 (69.1)	(6)	
	>60,000	16 (14.3)	22 (19.6)	74 (66.1)		
9.	**Number of siblings**					
	0 to 2	14 (18.9)	14 (18.9)	50 (67.6)		
	3 to 5	34 (22.7)	34 (22.7)	96 (64.0)	0.511	0.972
	6 to 9	19 (20.0)	19 (20.0)	63 (66.3)	(4)	

Respondents were asked about skin related questions and a number of responses were collected. Results of Chi square analysis showed that Dermatological life quality index (DLQI) is significantly associated with respondent thinking about having skin problem (p= 0.002), family members having skin issue (p= 0.001), perceived respondent confidence level in general (p= 0.010), knowledge about skin product marked as yes (p= 0.001), number of visits to skin clinic (p= 0.001), reasons for visiting skin clinic (p= 0.001), healthy skin diet (p= 0.004), preference for healthy skin diet (0.025), use of skin cream (p= 0.047), knowledge about harmful skin products (p= 0.003) and preference given for skin products regarding price (p= 0.001). DLQI is also associated with skin type, knowledge about healthy skin products, use of healthy skin diet, use of skin creams and preference for doctor's advice but the results are statistically insignificant (p value> 0.05).

Table 5: Association of Dermatological life quality index (DLQI) with Skin related characteristics

S.No	Variables	No and Small effect at all n (%)	Moderate effect n (%)	Very and Extremely large effect n (%)	Chi-square (df)	P-value
1.	**Perceived skin type of respondent**					
	Oily	15 (15.3)	21 (21.4)	62 (63.3)		
	Dry	6 (7.4)	16 (19.8)	59 (72.8)	7.183	0.304
	Normal	14 (14.1)	25 (25.3)	60 (60.6)	(6)	
	Sensitive	8 (19.5)	5 (12.2)	28 (68.3)		
2.	**Do you think you have skin problems?**					
	No	15 (12.4)	33 (27.3)	73 (60.3)		
	Yes	16 (10.4)	23 (14.9)	115 (74.7)	17.299	**0.002**
	Don't Know	12 (27.3)	11 (25.0)	21 (47.7)	(4)	
3.	**Do your family members have skin issue?**					
	No	29 (18.0)	42 (26.1)	90 (55.9)	13.543	**0.001**
	Yes	14 (8.9)	25 (15.8)	119 (75.3)	(2)	
4.	**Do you cover your face when you go outside?**					
	Always	15 (18.1)	12 (14.5)	56 (67.5)		
	Sometimes	20 (12.8)	38 (24.4)	98 (62.5)	4.948	0.293
	Never	8 (10.0)	17 (21.2)	55 (68.8)	(4)	

5.	**Perceived respondent confidence level in general**					
	High	11 (10.7)	20 (19.4)	72 (69.9)		
	Normal	32 (17.8)	42 (23.3)	106 (58.9)	13.215	**0.010**
	Low	0 (0.0)	5 (13.9)	31 (86.1)	(4)	
6.	**Knowledge about healthy skin products**					
	Yes	24 (11.7)	41 (19.9)	141 (68.4)	2.540	0.281
	No	19 (16.8)	26 (23.0)	68 (60.2)	(2)	
7.	**If yes, which one**					
	Natural Products	9 (17.6)	20 (39.2)	22 (43.1)		
	Herbal	12 (14.1)	13 (15.3)	60 (70.6)	24.803	**0.001**
	Medicated	3 (4.3)	8 (11.4)	59 (84.3)	(4)	
8.	**Number of visits to skin clinic**					
	Once a year	3 (4.5)	4 (6.1)	59 (89.4)		
	Twice a year	0 (0.0)	12 (20.0)	48 (80.0)	60.488	**0.001**
	Thrice a year	5 (7.8)	13 (20.3)	46 (71.9)	(6)	
	Never	35 (27.1)	38 (29.5)	56 (43.4)		
9.	**Reasons for visiting clinic**					
	Skin Disease	6 (9.5)	16 (25.4)	41 (65.1)		
	Esthetic Care	1 (1.9)	7 (13.2)	45 (84.9)	24.927	**0.001**
	Laser Therapy	6 (10.5)	7 (12.3)	44 (77.2)	(6)	
	Others	30 (20.5)	37 (25.3)	79 (54.1)		

10.	**Ever concerned about your skin**					
	No	14 (19.8)	26 (18.2)	103 (72.0)	5.277	0.071
	Yes	29 (16.5)	41 (23.3)	106 (60.2)	(2)	
11.	**Do you know about healthy skin diet**					
	Yes	34 (17.1)	48 (24.1)	117 (58.8)	11.200	**0.004**
	No	9 (7.5)	19 (15.8)	92 (76.7)	(2)	
12.	**If yes then which one**					
	Fresh Fruits	10 (24.4)	8 (19.5)	23 (56.1)		
	Plenty of water	17 (22.1)	24 (31.2)	36 (46.8)	14.141	**0.025**
	Vegetables	5 (8.8)	9 (15.8)	43 (75.4)	(6)	
	Dairy Products	2 (8.3)	7 (29.2)	15 (62.5)		
13.	**Knowledge about healthy skin**					
	No	14 (12.2)	27 (23.5)	74 (64.3)	0.790	0.674
	Yes	29 (14.2)	40 (19.6)	135 (66.2)	(2)	
14.	**Ever used skin cream**					
	No	20 (11.6)	45 (26.0)	108 (62.4)	6.098	0.047
	Yes	23 (15.8)	22 (15.1)	101 (69.2)	(2)	
15.	**Knowledge about harmful skin products**					
	No	24 (15.6)	43 (27.9)	87 (56.5)	11.465	**0.003**
	Yes	19 (11.5)	24 (14.5)	122 (73.9)	(2)	

16.	**Preference for skin products regarding price**					
	No	41 (24.3)	46 (27.2)	82 (48.5)	59.801	**0.001**
	Yes	2 (1.3)	21 (14.0)	127 (84.7)	(2)	
17.	**Preference for skin Products regarding effectiveness**					
	No	18 (12.5)	29 (20.1)	97 (67.4)	0.416	0.812
	Yes	25 (14.3)	38 (21.7)	112 (64.0)	(2)	
18.	**Preference for skin products regarding doctor advice**					
	No	25 (18.1)	26 (18.8)	87 (63.0)	4.647	0.098
	Yes	18 (9.9)	41 (22.7)	122 (67.4)	(2)	

CHAPTER V: DISCUSSION

In the present study assessment of skin related quality of life among students at public and private universities was done. Assessment of skin related quality of life among students was done using tools adapted from previous studies. Probability multi stage random sampling was used. Pilot testing was performed before starting the formal data collection procedure by including 10% of actual sample size (330). Reliability was checked after entering data into SPSS. The value of Cronbach's alpha recorded was 0.735. DLQI was tested independently with sociodemographic variables for their association and also with respondent skin related questions.

In the current study different socio-demographic characteristics and skin related quality of life among students were tested. It was found that there was a significant association of Dermatological life quality index with age of respondent (p= 0.001), gender of respondent (p= 0.001), institute of respondent (p= 0.001), pocket money of respondent (p= 0.001) and type of living (p= 0.001). Moreover, skin related quality of life is also associated with number of siblings but the result is statistically insignificant (p value> 0.05).

Overall, the study revealed that there was small and no effect at all due to skin related quality of life among (16.4%) of students, having moderate effect on (20.3%), very and extremely large effect on (63.3%). This revealed that skin related issues had a very large effect on quality of life among adults. Similarly, another study carried out on psychosocial impact of acne vulgaris on quality of life among youth showed that acne vulgaris had moderate (46%) to severe impact (44%) on social life of individuals (Veselaj et al., 2014).

Present study revealed that age group between 21-23 years were having extremely large effect on skin related quality of life as compared to others age group (p= 0.001). On the other hand, males were more effected by skin related quality of life than females (p= 0.001). Another study conducted at Joao Pessoa at Brazil also showed that prevalence of acne vulgaris more among males (91%) than in females (87.8%). Moderate and severe forms were more prevalent in males (ratio of prevalence of 1.47, CI 95%: 1.085- 2.003) and light degree in females. The study also revealed the correlation between severity of acne vulgaris and worse quality of life while self-esteem was not significantly associated with the severity of acne vulgaris (Vilar et al., 2015).

Students studying in private universities were also more effected as compared public universities (p= 0.001). Students having more pocket money were also more effected regarding skin related quality of life (p= 0.001). This may be due to use of different skin toning products, parlor's visit and use of different whitening agents for face. Another study conducted in Quetta Pakistan also revealed that DLQI was significantly associated with education level and income of respondent ($p < 0.05$) (Ghafoor et al., 2018). Similarly, another study also showed that whose pocket money was increased were likely using more skin toning products (AOR = 2.118, CI 0.419–10.703) (Duah et al., 2019).

Results showed that students living in boarding were having good health related quality of life than as compared to day scholars (p= 0.001). The reason for these may be due to consumption of unhealthy food by day scholars and skipping of healthy meals and diet plan. Such negligence can result in deteriorated skin related quality of life.

Respondents with dry skin were much largely affected due to skin related quality of life as compared to others (n= 59, 72.8%) and statistically insignificant ($p >0.05$). The results are in

contrast with a study conducted at Ayub Teaching Hospital Abbottabad showed a large number of respondent's reporting with oily skin (64.9%) and depression was also predominant in females (77.6%) than males (52%) and the difference was statistically significant (p= 0.023) (Haroon et al., 2019). Previous literature also revealed that high prevalence of acne vulgaris was observed in oily skin (70%, CI, 65.5-75.6), followed by normal skin (15%, CI, 10.6-20.9), the semi oily skin (9%, CI, 4.5-14.3) and dry skin type of the skin (6%, CI, 1.8-11.2) (Ali et al., 2019).

Most of the respondents were aware of their skin issues (n= 115, 74.7%). Similarly, another study conducted in Lao community also revealed that (n= 124, 71%) of people had also previous skin problems and were mostly reported in nuclear families (57%). This may be due to lack of awareness and social distancing (Wootton et al., 2018). Majority of the respondent's family had skin related issues (n= 40, 24.8%). A study conducted in Saudia Arabia also had similar findings that poor QOL was reported among respondents having positive family history of the same lesions (t= 2.88, p= 0.004) (Press, 2012).

Also, the study revealed perceived normal level confidence among students in general (p= 0.010) and does not face any difficulty while doing sports (44.5%) and studying and working (36.4%). Similarly, another study conducted on undergraduate female students in Rawalpindi and Islamabad also revealed that more than half of the participants (53.3%) were not worried while doing shopping, in playing sports (67.3%) and while studying and working (73.9%) (Babar & Mobeen, 2019).

Study showed that mostly students were aware of the healthy skin products (68.4%). The skin products mostly preferred by respondent's were medicated (p= 0.001). According to another study conducted in Pakistan showed that (59%) of women uses whitening creams in order to

enhance the looks and fair complexion (Khan et al., 2021). Majority of the respondents with very and extremely large effect had clinical visits for skin at least a year (p= 0.001) and the reasons for visiting skin clinic mostly was esthetic care (p= 0.001).

Results revealed that mostly students were not concerned about the skin (p > 0.005). The results are in contrast with a study conducted in Ghana where respondent's mostly above 21 years of age were 0.4 times more likely to use skin products (AOR = 0.400, CI 0.121– 1.320). Also, respondent's with dark skin were 3.3 times more likely using toning products (AOR = 3.287, CI 1.503–7.187) (Duah et al., 2019).

Additionally, most of the students didn't know about healthy skin diet (p= 0.004) and according to them the highly effective diet was use of vegetables (p= 0.025). As, good food results into good health. Another study was conducted which revealed that food has direct effect on the occurrence of acne vulgaris. Overall, (72%) people had no aggravating effect while highest prevalence (21%, CI, 16.7-14.6) reported in spicy food consumers as compare to (9%, CI, 4.5-14.6) $\chi 2 = 8.05$, P = 0.014) normal food consumers (Ali et al., 2019).

Another important point is that preference was given by the students for the price of products and students were having good knowledge regarding harmful skin products (p= 0.003) and preference for skin products regarding doctor advise but the results are statistically insignificant (p> 0.05). Similarly, another study conducted in Quetta also showed that higher income was positively associated with QOL. Low-income people face huge stress related to healthcare expenses and are worried about the impact of diseases and the consequential development of co-morbidities. Income was significantly associated with Dermatological Life Quality Index (DLQI). Mean DLQI score for the current study was 4.21± 0.9 out of 6 followed by daily activities and leisure (3.9 ± 1.1 and 3.8 ± 0.9 respectively) (Ghafoor et al., 2018).

5.1. Strengths:

The current study has used a validated and internationally accepted tool i.e., Dermatological Life Quality Index (DLQI). This tool is widely used for the assessment of skin related quality of life. This tool helps in the evaluation of different aspects (symptoms, feelings, routine daily activities, sports activities, work and school, personal relationships, and treatment). Moreover, the current study is somehow successful in assessing skin related quality of life as a representative sample was calculated for this study. The present study was conducted at public and private universities and respondents from different socio-economic groups were included. However, this study was unique in sense as less literature is available regarding skin related quality of life among university students. The findings of the current study can be generalized to students from other parts of Pakistan due to similar contextual factors. We anticipate that the results of this research might impact skin related quality of life among students.

5.2. Limitations:

Despite the sincere efforts of the researcher, few limitations were still present in the current study. Firstly, it was a cross-sectional study and hence no causal relationship can be established in this study. Secondly, it was a time bond study. Thirdly, the research was limited to Rawalpindi city. Fourthly, budget and time duration were also less i.e., six months. As the study focused on skin related quality of life so detailed analysis of the psychosocial management and its effect on improving dysfunction due to various skin diseases was beyond the scope of this research and needs further investigations.

5.3. Conclusion:

The current study demonstrated that most of the respondents were very and largely effected due to skin related quality of life. The study revealed more worst quality of life among males than females and mostly age group varying between 21-23 years. The study also reported worse skin related quality of life among respondents having higher pocket money. The use of medicated products was more by the students as compared to herbal and natural products and mostly students were having positive family history of skin diseases. Majority of respondents also reported a lot of problems in daily routine activities due to skin related issues.

5.4. Recommendations:

Based on the current findings, following recommendations are put forward for the health authorities and future researcher to address this untapped public health issue.

- Lack of knowledge regarding skin related quality of life should be improved among students especially males as they are less concerned related to skin.
- Awareness should be given to students especially in the young age group and providing information on the use of different skin creams and its harmful effect on skin.
- School, colleges and universities should have support group and access for students should be at ease to such mental health professionals in order to prevent psychosocial distress related to the physical appearance.
- This study might be useful for future research at different universities to investigate how young people place significance on skin related health in comparison to the environment in which they were raised.
- This study should also be carried out on different age groups in order to find out in depth analysis of self-rated confidence among people at different periods of life.
- Qualitative study should be carried out in order to identify the root causes of very and extremely large effect on skin related quality of life among university students.
- Future studies should include a large sample size and risk factors in order to identify the causes and its effect on skin related QOL.
- The study should be carried out on large scale in order to identify the influence of skin related problems on students.

References

Akinkugbe, A. O., Amira, O. C., Ozoh, O. B., & Bandele, E. (n.d.). *Pattern of skin disorders… Akinkugbe et al - ISSN 1597-4292*. *16*(2).

Ali, F., Hasni, M. S., Ali, S. Z., Khan, A., & Mehak, T. (2019). *Determination of various risk factors associated with acne vulgaris infection in Quetta , Pakistan*. *8*(3), 1919–1924.

Aman, S., Nadeem, M., Mahmood, K., & Ghafoor, M. B. (2017). Pattern of skin diseases among patients attending a tertiary care hospital in Lahore, Pakistan. *Journal of Taibah University Medical Sciences*, *12*(5), 392–396. https://doi.org/10.1016/j.jtumed.2017.04.007

Babar, O., & Mobeen, A. (2019). *Prevalence and Psychological Impact of Acne Vulgaris in Female Undergraduate Medical Students of Rawalpindi and Islamabad , Pakistan*. *11*(9), 5–11. https://doi.org/10.7759/cureus.5722

Chowdary, N. K., Shenoi, S. D., Nayak, S. U. K., & Prabhu, S. S. (2018). Quality of life in acne patients: A clinical and dermatology life quality index (DLQI) based cross-sectional study. *Journal of Pakistan Association of Dermatologists*, *28*(4), 415–419.

Cortés, H., Rojas-Márquez, M., Del Prado-Audelo, M. L., Reyes-Hernández, O. D., González-Del Carmen, M., & Leyva-Gómez, G. (2022). Alterations in mental health and quality of life in patients with skin disorders: a narrative review. *International Journal of Dermatology*, *61*(7), 783–791. https://doi.org/10.1111/ijd.15852

Duah, W. A., Mensah, C. M., Anokye, R., Dadzie, E., Gyimah, A. A., Holmes, F. A., Peprah, P., Yawson, F., & Baah, E. A. (2019). Prevalence and patterns of skin toning practices among female students in Ghana : a cross - sectional university - based survey. *BMC Research Notes*, 1–7. https://doi.org/10.1186/s13104-019-4327-8

Duru, P., & Örsal, Ö. (2021). The effect of acne on quality of life, social appearance anxiety, and use of conventional, complementary, and alternative treatments. *Complementary Therapies in Medicine*, *56*. https://doi.org/10.1016/j.ctim.2020.102614

Ejaz, A., Rao, S. E., Manzoor, A., & Niaz, A. (2015). *Original Article Quality of life assessment in chronic skin disorders*. *25*(2), 86–89.

Eltaher, S. M., & Araby, E. M. (2015). *Health Related Quality Of Life In Patients With Vitiligo Objective of the work : 33*(2).

Farage, M. A., Miller, K. W., Sherman, S. N., & Tsevat, J. (2012). Assessing quality of life in older adult patients with skin disorders. *Global Journal of Health Science*, *4*(2), 119–131. https://doi.org/10.5539/gjhs.v4n2p119

Ghafoor, R., Saleem, F., Iqbal, Q., Hassali, M. A., Hashmi, F. K., Haider, S., Anwar, M., Uddin, Z., & Salman, M. (2018). Quality of Life in Patients with Skin Diseases Attending a Public Healthcare Institute of Quetta City, Pakistan. *Journal of Pharmacy Practice and Community Medicine*, *4*(1), 16–20. https://doi.org/10.5530/jppcm.2018.1.5

Grimes, P. E., & Miller, M. M. (2018). Vitiligo: Patient stories, self-esteem, and the psychological burden of disease. *International Journal of Women's Dermatology*, *4*(1), 32–37. https://doi.org/10.1016/j.ijwd.2017.11.005

Haroon, M. Z., Alam, A., Ullah, I., Ali, R., Taimur, F., & Raza, K. (2019). *Original article Quality of Life and depression among young patients suffering from acne*. *July*.

Hodge, J. A., Rohrer, T. A., Beek, M. J. Van, Margolis, D. J., Sober, A. J., & Weinstock, M. A. (2017). The burden of skin disease in the United States. *Journal of American Dermatology*. https://doi.org/10.1016/j.jaad.2016.12.043

Ikino, J. K., Priscilla, V., & Fröde, T. S. (2015). *Melasma and assessment of the quality of life in Brazilian women *. 90*(2), 196–200.

Kaikati, J., Zoghaib, S., Kechichian, E., Stephan, F., Helou, J., Sleilaty, G., & Tomb, R. (2021). The impact of acne treatment on quality of life and self-esteem: A prospective cohort study from Lebanon. *International Journal of Women's Dermatology*, *7*(4), 415–421. https://doi.org/10.1016/j.ijwd.2021.03.005

Khan, N. H., Ullah, F., Khan, T. A., Zafar, U., Khan, M. F. A., Mustaqeem, M., Shah, S. S., Wu, D. D., & Ji, X. Y. (2021). Personal-care cosmetic practices in pakistan: Current perspectives and management. *Clinical, Cosmetic and Investigational Dermatology*, *14*, 9–21. https://doi.org/10.2147/CCID.S270667

Kim, K. E., Cho, D., & Park, H. J. (2016). NU SC. *Life Sciences*.

https://doi.org/10.1016/j.lfs.2016.03.039

Koszorú, K., Hajdu, K., Brodszky, V., Szabó, Á., & Borza, J. (2022). *General and Skin-Specific Health-Related Quality of Life in Patients With Atopic Dermatitis Before and During the COVID-19 Pandemic*. *33*(December). https://doi.org/10.1097/DER.0000000000000908

Library, C. (2021). *Health-Related Quality of Life, Depression, and Self-esteem in Patients With Androgenetic Alopecia A Systematic Review and Meta-analysis*. *157*(8), 963–970. https://doi.org/10.1001/jamadermatol.2021.2196

Life, Q., Prevalence, A., Symptomatology, D., & Ideation, S. (n.d.). *Quality of Life, Anxiety Prevalence, Depression Symptomatology and Suicidal Ideation among Acne Patients in Lithuania*. https://doi.org/10.1111/ijlh.12426

M., L., C., T. A. N. H., D., P. J. W., M., A., E., S. A., & F., M. N. (2015). Acne Disability, Self Management and Help-Seeking Behaviour among Medical Students. *Medicine & Health (Universiti Kebangsaan Malaysia)*, *10*(1), 1. http://search.ebscohost.com/login.aspx?direct=true&amp%0Adb=jlh&amp%0AAN=117754992&amp%0Asite=ehost-live

Malik, K., Ahmad, M., Zafar, M., Ullah, R., Mahmood, H. M., & Parveen, B. (2019). *An ethnobotanical study of medicinal plants used to treat skin diseases in northern Pakistan*. *6*, 1–38.

Pochynok, T., Chernyshov, I. P., Asayevich, N., Sushko, S., Kopylova, V., & Chernyshov, P. V. (2018). Quality of life of school and university students with acne. *Acta Dermatovenerologica Croatica*, *26*(2), 139–145.

Press, D. (2012). *Quality of life in patients with skin diseases in central Saudi Arabia*. 633–642.

Rahamathulla, M. P. (2019). *Prevalence of skin disorders and associated socio-economic factors among primary school children in the Eastern region of Saudi Arabia*. *December 2016*, 1175–1180.

Rhee, J. S., Matthews, B. A., Neuburg, M., Smith, T. L., Burzynski, M., & Nattinger, A. B. (2004). Skin Cancer and Quality of Life: Assessment with the Dermatology Life Quality Index. *Dermatologic Surgery*, *30*(4 I), 525–529. https://doi.org/10.1111/j.1524-

4725.2004.30169.x

Rumsey, N. (2018). Psychosocial adjustment to skin conditions resulting in visible difference (disfigurement): What do we know? Why don't we know more? How shall we move forward? *International Journal of Women's Dermatology*, *4*(1), 2–7. https://doi.org/10.1016/j.ijwd.2017.09.005

Salman, A., Kurt, E., Topcuoglu, V., & Demircay, Z. (2016). Social Anxiety and Quality of Life in Vitiligo and Acne Patients with Facial Involvement : A Cross-Sectional Controlled Study. *American Journal of Clinical Dermatology*. https://doi.org/10.1007/s40257-016-0172-x

Tasoula, E., Gregoriou, S., Chalikias, J., Lazarou, D., Danopoulou, I., Katsambas, A., & Rigopoulos, D. (2012). The impact of acne vulgaris on quality of life and psychic health in young adolescents in Greece: results of a population survey. *Anais Brasileiros de Dermatologia*, *87*(6), 862–869. https://doi.org/10.1590/s0365-05962012000600007

Tayel, K., Attia, M., Agamia, N., & Fadl, N. (2020). *Acne vulgaris : prevalence , severity , and impact on quality of life and self-esteem among Egyptian adolescents*. *9*.

Thatikonda, C. S., Panda, S., & Penmetcha, C. L. (2021). *Pattern of skin disorders among geriatric and middle aged patients : A comparative study*. *8*(1), 21–26.

Veselaj, F., Manxhuka-kerliu, S., Shahini, L., & Selmani, L. (2014). *HealthMED*. *November*.

Vilar, G. N., Dos Santos, L. A., & Filho, J. F. S. (2015). Quality of life, self-esteem and psychosocial factors in adolescents with acne vulgaris. *Anais Brasileiros de Dermatologia*, *90*(5), 622–629. https://doi.org/10.1590/abd1806-4841.201533726

Wootton, C. I., Bell, S., Philavanh, A., Phommachack, K., Soukavong, M., Kidoikhammouan, S., Walker, S. L., & Mayxay, M. (2018). Assessing skin disease and associated health-related quality of life in a rural Lao community. *BMC Dermatology*, *18*(1), 1–10. https://doi.org/10.1186/s12895-018-0079-8

Annexure 1

Data Collection Tool

Assessment of Skin Related Quality of Life Among University Students in Rawalpindi City

Section – A

Demographics

1) Age a. 18 – 20 Years b. 21 – 23 Years c. 24 – 26 Years d. 27 – 30 Years	**2) Gender** a. Male b. Female
3) Institute a. Public b. Private	**4) Family type** a. Nuclear b. Joint
5) Residence a. Main City b. Sub-Urban Area	**6) Your pocket money** a. Less than 20,000 b. 20,000 – 40,000
7) Type of living? a. Day scholar b. Hostelite	**8) Monthly family income** a. Less than 20,000 b. 40,000- 60,000 c. 20,000-40,000 d. 60,000 and above
9) Number of siblings _____	

Section-B

1. What is your skin type?

    a. Oily

    b. Normal

    c. Dry

    d. Sensitive

2. Do you think you have skin problems?

    a. No

    b. Yes

    c. Don’t know

3. Do your family members have any skin related issue?

    a. No

    b. Yes

4. Do you cover your face when go outside?

    a. Always

    b. Sometimes

    c. Never

5. How do you rate your confidence level in general?

a. High

b. Normal

c. Low

6. Do you have any knowledge about healthy skin products

a. No

b. Yes

if yes, please specify which ones?

a. Natural products

b. Herbal products

c. Medicated products

7. How many times do you visit a skin clinic in the last year?

a. Once a year

b. Twice a year

c. Thrice a year

d. Never

8. What are your reasons for visiting skin clinic?

a. Skin disease

b. Esthetic Care

c. Laser therapy

d. Other

9. Have you ever concerned about your skin?

a. No

b. Yes

10. Do you know about some healthy diets for skin?

a. No

b. Yes

If yes, please specify which one

a. Fresh fruits

b. Vegetables

c. Plenty of water

d. Dairy product

11. Do you have any knowledge about healthy skin?

a. No

b. Yes

12. Have you ever used skin creams?

a. No

b. Yes

13. Do you have any knowledge about harmful skin products?

a. No

b. Yes

14. What are your preference for skin products? (Tick as many as possible)

a. Price

b. Doctor advice

c. Effectiveness

Section – C

(Dermatology Life Quality Index)

Below is list of questions to measure how much your skin problems has affected your life over the last week.

1) Over the last week, how itchy, sore, painful or stinging has your skin been?
    - Very much
    - A lot
    - A lttle
    - Not at all
2) Over the last week, how embarrassed or self-conscious have you been because of your skin?
    - Very much
    - A lot
    - A little
    - Not at all
3) Over the last week, how much has your skin interfered with you going shopping or looking after your home or garden?
    - Very much
    - A lot
    - A little
    - Not at all

4) Over the last week, how much has your skin influenced the clothes you wear?

- Very much
- A lot
- A little
- Not at all

5) Over the last week, how much has your skin affected any social or leisure activities?

- Very much
- A lot
- A little
- Not at all

6) Over the last week, how much has your skin made it difficult for you to do any sport?

- Very much
- A lot
- A little
- Not at all

7) Over the last week, has your skin prevented you from working or studying?

- Very much
- A lot
- A little
- Not at all

8) Over the last week, how much has your skin created problems with your partner or any of your close friends or relatives?

- Very much
- A lot
- A little
- Not at all

9) Over the last week, how much has your skin caused problems in daily routine activities?

- Very much
- A lot
- A little
- Not at all

10) Over the last week, how much of a problem has the treatment for your skin been, for example by making your home messy, or by taking up time?

- Very much
- A lot
- A little
- Not at all

Thank you for your participation

Annexure 2

Scale Reliability

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.736	.735	26

Fig 12. Reliability of Scale

ANNEXURE 3

Informed Consent Form

I am Jazba Tareen, student of MSPH- Final Semester, Alshifa School of Public Health, Alshifa Eye Hospital, Rawalpindi. I am doing research on Assessment of Skin related Quality of Life among university students of Rawalpindi city.

PURPOSE OF THE RESEARCH

The purpose of this study is to assess skin related quality of life among students at public and private institutes in Rawalpindi city.

PARTICIPATION

I do not anticipate that taking this study will contain any risk or inconvenience to you. Your participation is strictly voluntary and you may withdraw your participation at any time without penalty. I request you to answer the questions as honestly as possible. It will take no longer than 20 minutes to complete a questionnaire. All information collected will be used only for research purpose and will be kept highly confidential. Your identity and your responses will not be identifiable; all data will be stored anonymously. As this is solely a student project no incentive will be provided. Once study is completed, I would be happy to share the results with you if you desire.

Thank you for agreeing to participate in this study. Your feedback is important.

Consent

I have read and understand the information sheet and agree to take part in the study.

Signature_____ Date_____

ANNEXURE 4

IRB Letter

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

MSPH-IRB/14-11
27th Sep, 2022

TO WHOM IT MAY CONCERN

This is to certify that **Jazba Tareen** D/O **Major Muhammad Yamin Farooq** 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 **"Assessment of skin related quality of life among university students in Rawalpindi city".**

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

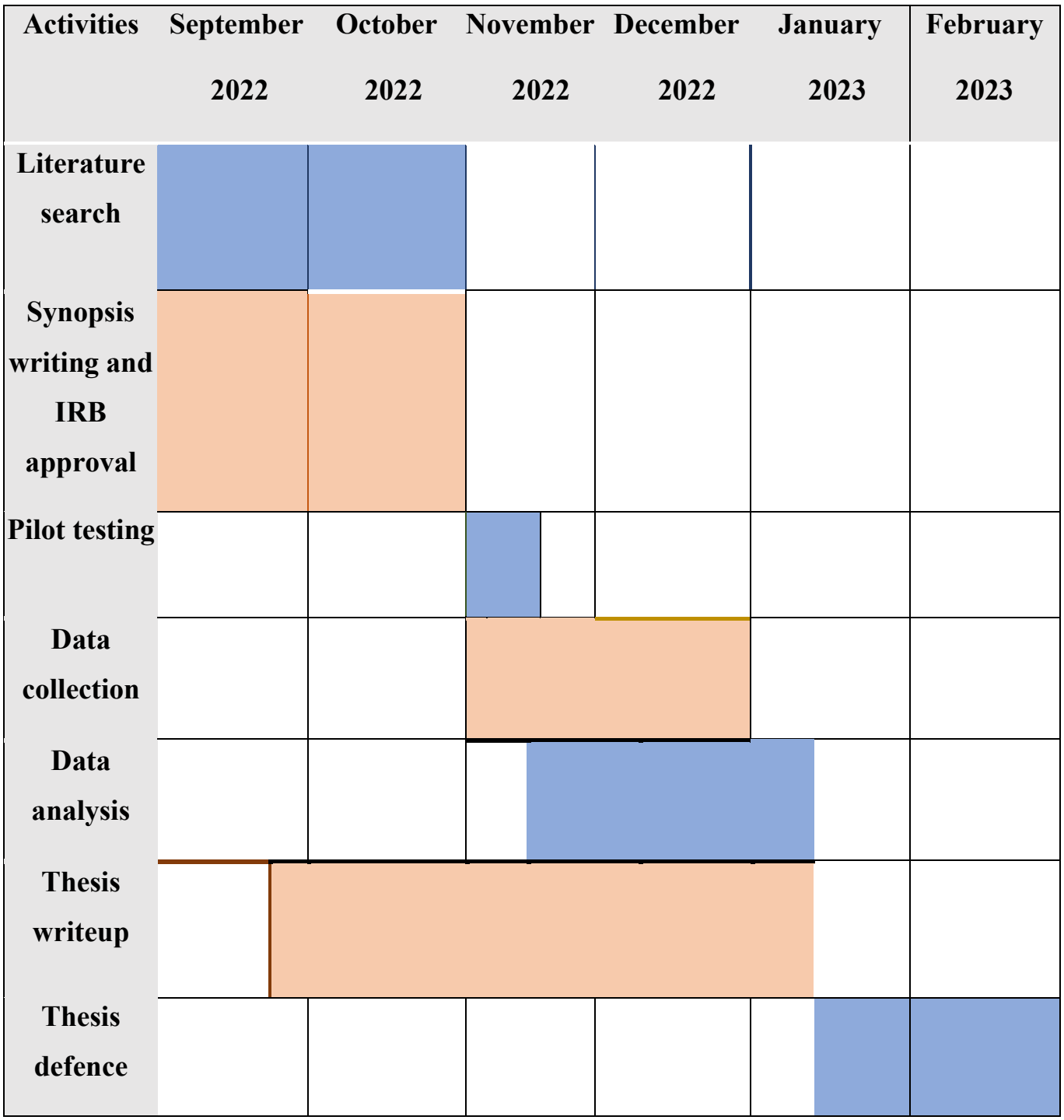
Sincerely,

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

AL-SHIFA TRUST, JEHLUM ROAD, RAWALPINDI – PAKISTAN
Tel: +92-51-5487820-472 Fax: +92-51-5487827
Email: info@alshifaeye.org, Web Site: www.alshifeye.org

ANNEXURE 5

Gantt Chart



ANNEXURE 6

Budget

Budget item	Transport	Stationery and Internet	Printing	Publishing
Pilot Testing	2000 Rs/-	3000 Rs/-	5000 Rs/-	-
Data collection	15,000 Rs/-	15,000 Rs/-	-	-
Thesis write-up	5,000 Rs/-	7,000 Rs/-	10,000 Rs/-	15,000 Rs/-
Total Expenditure	22,000 Rs/-	25,000 Rs/-	15,000 Rs/-	15,000 Rs/-
Grand total	77,000 Rs/-			