Health Communication in the Digital Era: New Media Influence on Knowledge, Attitudes, and Practices of University Students in Khyber Pakhtunkhwa Province of Pakistan.

Abstract

The proliferation of digital media has transformed how health information is accessed, interpreted, and applied, yet the impact of these platforms on youth cognition and behaviour remains underexplored in developing countries. This study investigates the relationship between new media usage and health-related knowledge, attitudes, and behavioural changes among university students in Khyber Pakhtunkhwa province of Pakistan. By integrating interdisciplinary perspectives from media studies, public health, and behavioural sciences, this study addresses a critical gap in health communication scholarship.

A cross-sectional survey of 636 students across five public universities of the province was conducted using a rigorously designed questionnaire covering five dimensions: information-seeking patterns, knowledge and cultural influence, attitudes and behaviouraloutcomes, new media usage, and socio-demographic characteristics. Reliability and validity were confirmed through Cronbach's Alpha analysis. Qualitative interviews with healthcare professionals and media scholars working in the province were incorporated to triangulate findings and enrich interpretation.

Results reveal that while youth are active users of social and online media, their engagement with these platforms for health information is limited, with a strong preference for guidance from licensed practitioners. Nonetheless, the Knowledge-Attitude-Behaviour (KAB) model effectively predicts the translation of health knowledge into attitudes and behaviour, independent of socio-demographic differences. These findings highlight both the underutilization of digital media for health communication and the potential for targeted interventions to enhance knowledge dissemination and behaviour modification.

This study provides a methodological and theoretical framework for future research on digital health communication in similar socio-cultural contexts. It underscores the value of integrating interdisciplinary approaches, including digital ethnography and discourse analysis, to capture nuanced information-seeking behaviours. Insights from this research can inform evidence-based media strategies, government-funded health campaigns, and the development of mobile health applications to optimize health literacy and outcomes among youth globally.

Keywords: Health Communication, Digital Media, KAB Model, Youth Health Literacy, Interdisciplinary Research, KPK Pakistan

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1. Introduction

As developing country with a population exceeding 240 million, Pakistan faces persistent challenges in numerous critical sectors, including education and healthcare. Since its independence in 1947, the country's healthcare system has continued to struggle over the past 78 years. In 2020, the World health Organization ranked Pakistan 122nd our of 190 countries, a position that underscores the poor state of healthcare quality in the nation.

According to the data from the Pakistan Bureau of Statistics and World bank's Development and Reforms 2023 report, Pakistan's per capita income ranges between approximately 1,890 and 2,000 US dollars. In contrast, health expenditure per capita stands at only about 45 to 50 US dollars, which constitutes roughly 3 to 3.2 percent of the country's Gross Domestic Product (GDP).

According to official provincial data from Khyber Pakhtunkhwa for the year 2023, the region had an estimated population of around 40 million, served by approximately 45,000 to 46,000 registered physician and between 3,500 and 3,700 health facilities. This corresponds to a physician density of roughly 0.9 per 1,000 persons.

The health communication landscape in Khyber Pakhtunkhwa is characterized by a diverse array of traditional, digital, and community-based channels, each of which plays a significant role in the dissemination of health-related information. In urban areas, populations increasingly rely on digital platforms and mobile phones as primary sources of health information. Government-let communication campaigns, frequently supported by international organizations such as the world Health Organization (WHO) and the United Nations Children's Fund (UNICEF), have been instrumental in addressing public health priorities, including polio eradication, maternal health, and vaccination initiatives. Nevertheless, persistent challenges related to disparities in literacy rates, linguistic diversity, and unequal access to technological infrastructure continue to limit both the reach and the effectiveness of these health communication efforts.

Pakistan's media after having been liberalized in 2002, the youth and professionals were equally attracted to this industry and hence the country experienced a media boom. Although the professional journalistic activity in every sector of media such as radio, TV, private news channels and newspaper showed exponential growth where people associated with different types of media progressively develop a free working environment (Siraj & Hussain, 2017). Public opinion gradually turned the significance of media activity in Pakistan very high and considered very important sources of information. Similarly, equal recognition is received for progressive media and social media in KPK from all sections of society.

In developing nations, including Pakistan, the reporting of health communication has historically not been a top priority or a central agenda item for mass media. A persistent gap exists between public needs and media practices, as there is a consistent demand among the population, particularly the youth, for regular media-led education on everyday health issues. However, media in Pakistan tend to cover health communication matters only when such issues escalate into national problems or assume the characteristics of endemic diseases. Consequently, routine health communication receives limited attention, and media engagement remains largely reactive rather than proactive.

Because of the formative and functionalist structure of Media outlets in Pakistan, media can altruistically be presumed of being the capability of setting agenda by presenting an increased quantity of structured information and it might be a surprising consequence to find out the media not involved in framing an issue particularly when it's of worldwide interest. MT Boykoff and J. Timmons Roberts (2007).

The staff working on both federal and provincial levels is lacking constantly in professional and specialized training and unable to form effective policies and implement effective health programs. The training organizations which are in charge for planning these kinds of health training programs themselves suffering from insufficient resources and specialized staff who is able to work efficiently. As per an assessment of the non-technical training section of population welfare ministry, the teaching staff working in population welfare training institutions has never ever attended any latest and advance training in area of communication (Bhatti and Hakim 2000).

In Pakistan, the evaluation of National program of health Education has revealed that health communication must have objectivity and clarity for the sake of bringing about better results. Pakistan is on high ranks within the countries where unsafe and unnecessary injections are used(Simonsen et al 1999). Health Communication scholars and professionals in Pakistan must be able to know what's better in current environment of the country if they borrow the concepts from developed countries and try to conduct communication research on fully methodologically solid grounds with precise assessment.

Health communication professionals in KPK need to apply the international standards and adapt them with the local culture circumstances, assess it thoroughly & then propagate it to masses. After relatively easy access to media by public including TV, radio, newspapers, magazines, and the internet in KPK, the province is rapidly catching up the culture of heavy media usage for numerous purposes. Yet, it is a fact that interpersonal communication is still considered to be an integral channel of awareness campaigns, and its inclusion should be fully highlighted to achieve better results with the community based public campaigns (Korhonen et al 1998).

2. Literature Review

Scholars and researchers working in the field of health communication are using multiple definitions and descriptions for health communication. According to Clift and Freimuth (1995), "Just like health education, health communication is also an approach which tries for behavioural change in a huge targeted population about a specific health issue in a predefined timeframe". The Centre for Disease Control and Prevention (CDC, 2001) explain that "Health Communication is primarily the study & usage of various communication techniques for informing and influencing individuals or group of individuals to change their attitudes and behaviours for healthcare enhancement".

For the academician, (Ratzan, 1994) Health Communication is "the skill & practice to inform, influence, & encourage individuals, communities, institutions, and target population regarding significant health problems" & its capacity includes to prevent various kind of diseases, to promote health, healthcare strategies, & business as well as to work for the better quality of life and health within the targeted population.

There are many interesting and useful ways and sources from where health related information can be obtained. For example, health information is typically sought via interpersonal and media sources (Burkell, Wolfe, Potter, & Jutai, 2006). Initially individuals think that it is more convenient to consult family, friends, and personal sources for health information (Buller, Callister, & Reichert, 1995), though the other sources like Internet, TV, radio, newspapers and magazines are also subsequent and very important sources for health information (Brashers, Goldsmith, & Hseih, 2002).

Digital media is certainly an important and vital health information source, as it defines sickness & being healthy, features & goods that can help people in managing their health condition, and provides a depiction of those people who have symptoms of a particular disease to rest of the people (Cotton &Gupta, 2004).

Piccioni& Sparks' (2007) research found some interesting facts and stated that in terms of health information sources, mostly family members of the patients are significantly more satisfied with the internet and consider it a valuable source, while on other hand in the same research it was revealed that, patients themselves with respect to information seeking source showed more satisfaction with doctors, nurses and other relevant medical staff.

According to Piotrow et al (1997), Impact evaluation can be ignored easily until a project is about to end but it's very hard to carry it out unless it is planned effectively from the beginning. Similar with the process of health communication/education, evaluation process also begins along with the initial analysis and which actually provides baseline data and significant background information.

In social studies, it is also being theorized that People struggling with economic disparities have Low level of knowledge too. (Choudry, 2014) These deficiencies elicit dependency on media (Ball-Rokeach, 1976) and to fulfill the need a very high rate of consumption of media contents like social issues, current affairs, public and science news, etc., are believed to occur in areas that are specific and associated with individual interests.

In such situations, when people out of their knowledge scarcity are too dependent on the media in their need’s attainment, it also exalts the media with an opportunity to control and frame their cognitions, attitudes and practices by placing planned contents before them. (Patrick Rossler & Michael Schenk, 2000). The news coverage of public interest issues is to have widespread influence and it is not limited to just individuals. A very significant consequence of agenda setting is related to the public opinion and beliefs. (Amye Jasperson,1998).

3. Significance of the Study

Health Communication, health literacy and social media are relatively new and emerging concepts and all these have been greatly emphasized by all the stake-holders especially in developing countries (World Health Organization, 2012). However, the concepts of health communication and health literacy did not get high recognition and were unable to get appreciation in the developing world as the economically under developed or developing countries usually struggling for making sure the accessibility of very primary kind of health-related requirements to its public notes van Rensburg, (2014) and Wilson, (2003).

If people in KPK province are unable to understand the very basic type of healthcare messages and announcements by mainstream and social media, then ultimately it will become hard for every individual to ensure healthy living Epp (1986). In wider perspective, in Pakistan, traditional media has not played its due role with respect to health communication and for the promotion of healthy living standards and this is the reason that people have started to rely on social media for the this purpose. Most of the developing countries like Pakistan has poor literacy ratio till the date and that's why people living in those countries are assumed to have poor health literacy while the mainstream media usually focus on news which are in least interest of the general public notes Tsfati, and Cappella, (2003), McLeod, and Hertog, (1992).

Another very vital aspect of this research is to know that whether a huge portion of the health information disseminated by media in different languages regarding different diseases satisfy the needs of the people or not. This study can prove very much helpful to understand the health information needs and problems of the consumers in KPK, where a huge number of people have poor literacy level and do not understand the exact meaning of different health-related messages.

This study therefore seeks to understand and explain how elements such as production and distribution of health-related news on social media will provide a solid and scientific base for the formulation of provincial policies regarding health and the usage of digital technologies. This research study also aims to provide empirical evidence to understand about the usage of new media and digital technology in heath communication. It has been assumed that the research will provide new perspectives to the study of health communication in KPK by locating it in the era of new media by using the dual lenses of communication actions and logic of connective actions.

4. Purpose of the Study and Rationale

Globally, new media, mobile technologies, and modern digital platforms are playing a vital role in the digitization of various sectors, including health, by enabling stakeholders such as patients and healthcare professionals to communicate about health issues in virtual environments. This study primarily focuses on examining the role of social media in creating health awareness among the youth of Khyber Pakhtunkhwa (KPK) province. It is timely to investigate the disparities in information retention and interpretation among youth regarding health services and related issues.

Furthermore, it is pertinent to learn from practices in developed societies to determine the level of health-related information possessed by youth in those contexts, as such insights could inform practices in developing countries. It is speculated that due to income and standard of living disparities, youth in KPK are the least concerned with health-related matters; conversely, youth with higher levels of education are hypothesized to exhibit greater concern about health issues and better access to information.

It is also speculated that students from health and medical sciences disciplines in various provincial universities are more attentive to healthcare news and information that can promote healthier lifestyles. The study is rationalized on the basis of both academic and applied utility. Academically, it will test the Knowledge, Attitude, and Practice (KAP) model, and the resulting data will serve as a scientific supplement to the KAP model applicability in

any global context. At the applied level, the study will produce a detailed document of significant value for a wide range of stakeholders in KPK province, including physicians, patients, healthcare providers, medical students, researchers, and journalists covering health.

5. Research Questions

RQ1: How effective are the health communication campaigns of Ministry of Health about seasonal diseases among youth of Khyber Pakhtunkhwa?

RQ2: What is the information seeking patterns of youth for health-related issues in Khyber Pakhtunkhwa?

RQ3: What are the cognition patterns of youth link between emerging media and conventional media?

RQ4: Is the KAB (Knowledge, Attitude and Behaviour) model is equally applicable for Youth due to invention of emerging media?

6. Research Design

The principal methods of research that was used are literature reviews of various academic journals, news articles, previous research studies, interviews and data collections about the topic was carried out through surveys from the consumers of young age group comprising of both males and females. Mixed tools of qualitative research as defined by Kendall, L. (2003) Annette N. Markham (2009, 2013) and Godall H. L. (2003) was used.

The review of the literature has suggested a number of versatile research methodologies but a huge number of researchers working in the field of health communication rely on survey method due to numerous reasons including it seems to be the appropriate one for this kind of studies. This is also considered to be convenient for collection of data and make inferences while using the sophisticated statistical tools. Layder (1993) states that to select a research tool such as questionnaire over other methods of data collection is actually related to a researcher's belief regarding the character of society and epistemological views about how it needs to be researched. Therefore, understanding of the research nature provides a worthy guideline regarding the selection of any research methodology for investigating any particular social phenomena.

The review of relevant literature laid the foundation for most of the conceptual frameworks employed in this study, including the selection of variables, the choice of research methodology, and the development of the theoretical framework. To support the arguments and case building presented in the introduction as well as the sections on evolution and cognition, a comprehensive survey was conducted across five popular public universities in Khyber Pakhtunkhwa (KPK), and data were collected from respondents. Furthermore, the use of qualitative tools afforded greater freedom to construct creative and compelling arguments that engage with larger scholarly conversations both within and beyond the academic community.

7. Population of the Study

The population of this study comprised university-enrolled youth in Khyber Pakhtunkhwa (KPK) province. According to the United Nations Organization (UNO), youth are defined as

individuals between 15 and 25 years of age, a demographic considered a crucial segment of any society as they transition from the family phase to the community phase. For addressing matters of national and international concern, a more flexible age-based definition is often adopted, whereby any person aged 15 to 35 years is categorized as youth.

This definition is most commonly applied in research and survey contexts and is arguably the most effective approach for such strategies, as the age limit also facilitates the description of educational level and employment status. The term youth is used inclusively to refer to both genders (males and females) and is irrespective of gender specificity. The survey for this study was conducted across five public sector universities in KPK, with data collected from approximately 125 students per institution, thereby allowing for relatively generalized inferences.

Students below 18 years of age enrolled in colleges and high schools, as well as youth not enrolled in these universities, were excluded from consideration. Given the limitations regarding respondent numbers, a total of 650 respondents were expected to be surveyed across the province. This approach yielded a more versatile population sample, and the data collected from respondents in KPK produced notably interesting results. A non-probability sampling method and convenience sampling strategy were adopted, in consideration of the scope, requirements, and demands of this research study. These techniques were also deemed appropriate given the theoretical framework, which provided a solid and logical foundation for the study.

8. Sampling Techniques

A convenience sampling technique was employed for the selection of universities and the sampling of respondents. Consequently, after data collection, respondents were distributed into five categories based on their academic disciplines: social sciences, applied sciences, management sciences, health sciences, and humanities. This distribution into five categories does not imply any deficiency in the validity or generalizability of the questionnaire; rather, the data analysis is explained in its totality and applied exclusively to the specified group of respondents. The adoption of this sampling technique was motivated not solely by convenience but also by its utility in drawing inferences about social networks and social interaction among individuals.

The purpose of this research study was never to produce unbiased or truly generalizable results. As Markham (1995) explains, in social sciences research, it is both understandable and acceptable for the researcher's biases to be reflected in their work, and this phenomenon renders the research complete and comprehensive in its totality. Thus, personal reflections of the researcher constitute an integral part of the research, particularly in the social sciences. University students were selected because they were easily accessible and willing to assist during the data collection phase. Therefore, the age group of the respondents does not represent the entirety of youth, but rather the subset of youth who study at the university level.

In Pakistan, the majority of university students are undergraduates, typically between 21 and 26 years of age. The respondents were not equally or systematically distributed according to their educational level, and youth studying below the university level were not included in this study. Consequently, the answers and characteristics revealed from this survey cannot be

generalized to students at the school or college level. Furthermore, these age groups may not fully represent the entire youth population of KPK studying across different cities and educational levels. Therefore, the age and education groups have been clearly delineated to indicate which group exhibit greater inclination toward which tendency, and their complete interrelationship is thoroughly explained in the data analysis chapter of this study.

9. Analysis of the Respondents

9.1 Gender

As shown in the frequency analysis presented in the table below, a total of 636 respondents were sampled from five universities in Khyber Pakhtunkhwa province. Notably, there were no missing data points with respect to respondent gender. This complete reporting can be attributed to the inclusion of both gender column and a name column in the questionnaire, which allowed for the identification of every respondent's gender.

Gender Group

		Frequency	Percent
Valid	Female	279	43.9
	Male	357	56.1
	Total	636	100

Table1: Gender Group of respondents

The data indicate that male respondents slightly outnumber female respondents. Specifically, males constitute 56.1% of the total sample, while females account for the remaining 43.9%.

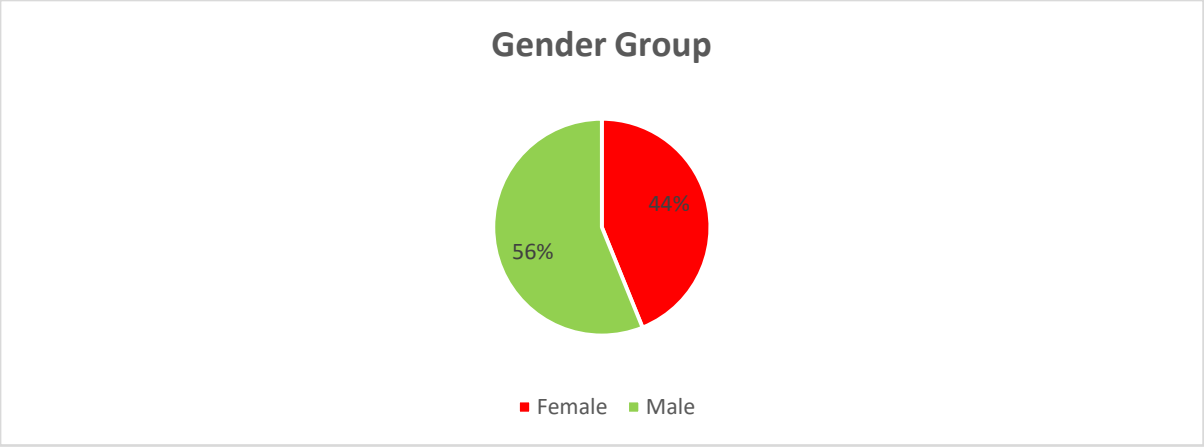

Figure 1: An analysis of Gender Group of respondents

9.2 Age Group of Respondents

Respondents' ages were initially collected in years. To facilitate data processing and enhance analytical manageability, age was subsequently recoded into categorical groups. These groupings were designed to allow for straightforward classification and optimal data presentation. The findings indicate that the majority of respondents fall within the 21-23 age bracket. Furthermore, the age range of 21 to 26 years constitutes the predominant segment of the university population, encompassing students enrolled across various academic programs and levels of study.

Age Groups

		Frequency	Percent
Valid	21-23	324	50.9
	18-20	142	22.3
	24-26	128	20.1
	27-29	42	6.6
	Total	636	100

Table2: Age group of respondents

As presented in the table above, the distribution of respondents across age groups remains consistent. The majority of the sample, specifically, 94% of the total population falls within the 18 to 26 age range. The group is further subdivided into three equally sized categories.

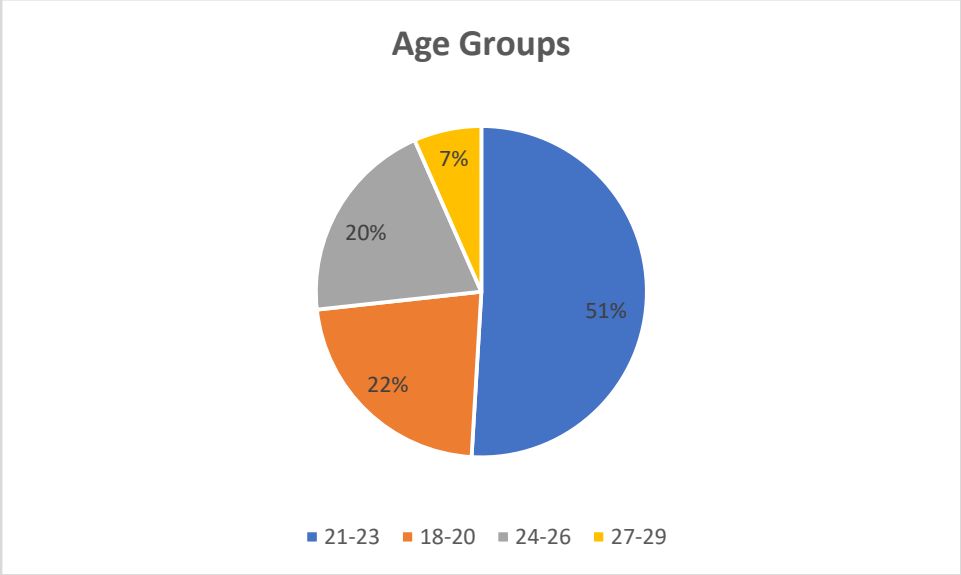

Figure 2: Age group of respondents

As indicated, there is variation in the percentage distribution across age groups. The proportion of respondents in the 21-23 age group is higher than that of all other age groups. In contrast, the remaining age groups exhibit largely similar percentages, reflecting a relatively even distribution within the broader youth population under study.

9.3 Marital Status of the Respondents

In academic research on health communication across diverse global contexts, marital status constitutes a highly significant variable and a critical survey question. Its importance stems from direct association between an individual's marital status and their engagement with, or responsiveness to, health communication efforts.

Marital Status

		Frequency	Percent
Valid	Single	579	91
	Missing	13	2
	Married	44	7
	Total	636	100

Table3: Marital status of the resopndents

As indicated above,91% of the respondents are single, the data from 2% respondents are missing, and very small number of respondents which is 7% were found married.

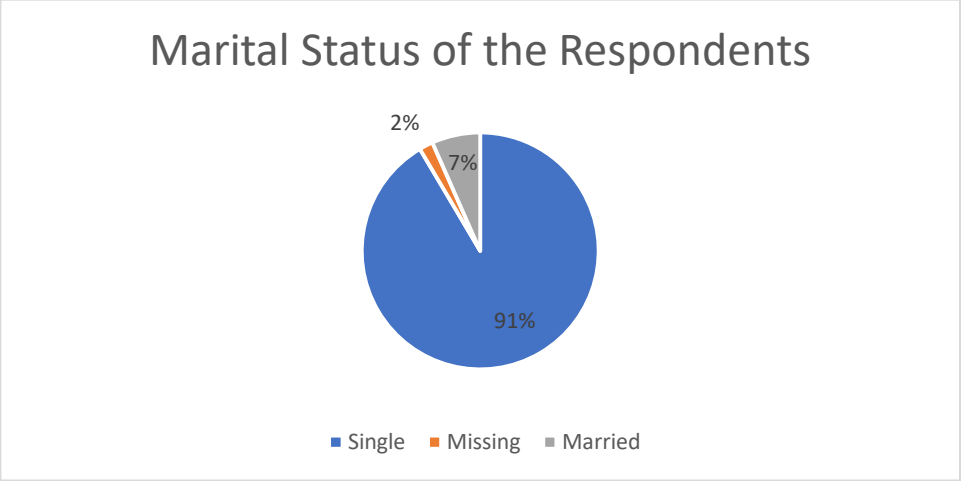

Figure 3: Marital status of the resopndents

The analysis of the data presented in the graph indicates that a majority of the respondents are single. This finding is noteworthy, as it contrasts with the observation that married individuals tend to exhibit greater engagement with health-related news and information. A plausible explanation for this pattern is that married people, owing to their family bonds and mutual caregiving responsibilities, are more likely to be concerned and health issues, not only for themselves but also for their children, both in the immediate and longer-term future.

9.4 Education of the Respondents

Education

		Frequency	Percent
Valid	Undergraduate	588	92.5
	Graduate	48	7.5

Total	636	100

Table4: Education of the respondents

The table above presents the educational status of the respondents. Data were collected based on two categories: graduate and undergraduate. The majority of respondents, approximately 93% were undergraduate students, indicating that the distribution of the sample is slightly skewed toward younger individuals. Consequently, the educational composition of the sample is heavily weighted toward undergraduates. Only 7% of the respondents were enrolled in graduate studies. Data collection was conducted personally by the researcher, without the involvement of research assistant. As a result, no forms were missing with respect to respondents' educational information.

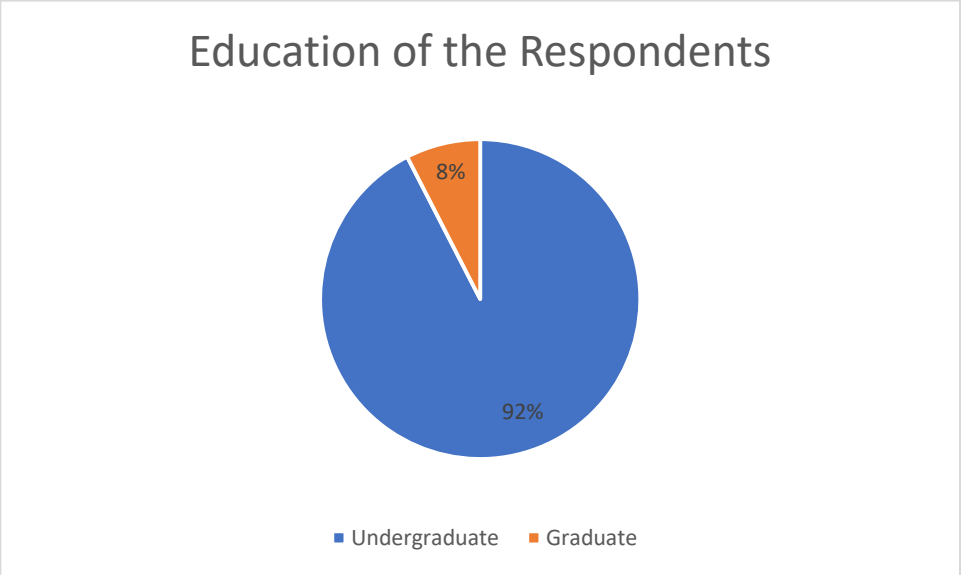

Figure 4: Education of the respondents

Education exhibits a direct link and correlation with health communication information. Within this research, education conceptualized as knowledge, served as a well-considered indicator for health communication-related information. It is a fundamental assumption of the research hypothesis that higher levels of education (understood as possessing knowledge and recognized standards) correspond to greater knowledge, thereby contributing to change in respondents' attitudes and behaviours.

Consistent with the theoretical tradition and guided by various related considerations, this question was emphasized and deliberately included in the survey instrument. Initially, data on respondents' education were collected on an interval scale based on the years of schooling. Respondents reported educational attainment in terms of 12, 14, or 16 years, allowing for precise measurement. Subsequently, education was categorized into two main groups, graduate and undergraduate to construct a standardized questionnaire.

Regarding the data trends, the findings indicate that the majority of respondents are undergraduate students. Consequently, the data are broadly and generally applicable to the general youth population sharing similar age and educational levels.

9.5 Fathers' Education of Respondents

Fathers' education is a well-considered and contextually relevant variable, demonstrating a direct link with respondents' educational attainment. It is also directly associated with the premise, historically acknowledged in research that a higher level of paternal education tends to correspond with greater household organization and systemic functioning. Within familial structures, health has traditionally been regarded as a paternal responsibility.

This variable has been recognized as important in past studies conducted in various regions of the word. Accordingly, respondents were asked about their fathers' education as part of the socio-demographic section of the questionnaire.

The educational levels of fathers were measured using the same scale as that used for respondents, ensuring comparability between the two standards. The data indicate that the majority of responses are concentrated among fathers whose educational attainment falls within the undergraduate category.

Father's Education

		Frequency	Percent
Valid	Graduate	97	15.25
	Undergraduate	465	73.11
	Missing	30	4.72
	Others	44	6.92
	Total	636	100

Table5: Father's Education of the respondents

The data collected from respondents indicate that a substantial majority of fathers possessed an undergraduate education. Specifically, 73% of respondents reported that their fathers held an undergraduate degree. Following this, 15% of respondents indicated that their fathers had attained a graduate level of education. Approximately 11% of the responses were either missing or did not conform to the standardized criteria established for paternal education namely, the graduate and undergraduate categories applied to respondents.

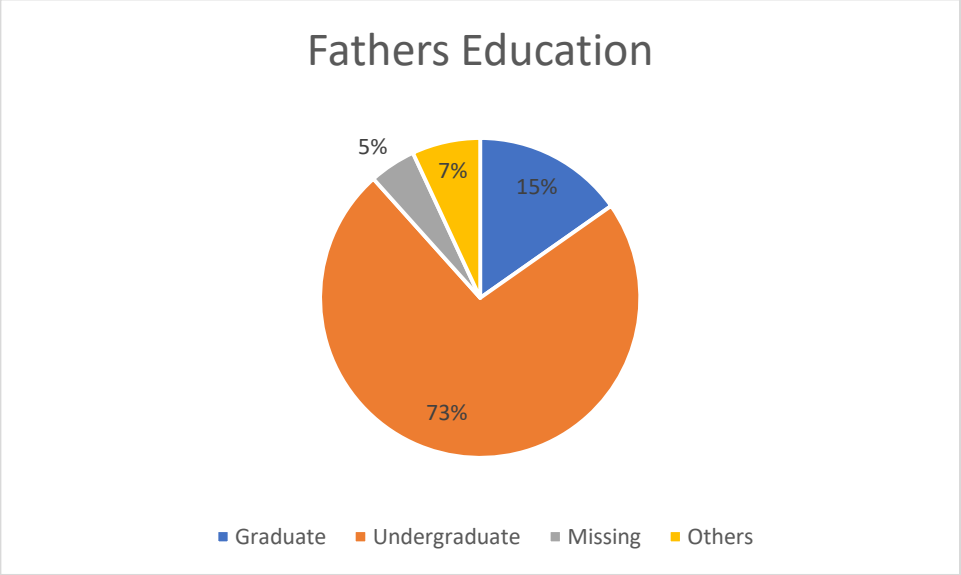

Figure 5: Fathers Education of the respondents

As illustrated in the figure above, the distribution of respondents is largely balanced across most variables, with the exception of the data concerning paternal education at the undergraduate level. A notable disparity is observed specifically in this category, where 73% of respondents reported that their fathers hold an undergraduate degree.

9.6 Subject Area of the Respondents

The subject area of respondents was identified as a critical socio-demographic variable, recognized as important in the majority of previous studies. An analysis of the respondent data indicates that the majority are enrolled in the social sciences and applied sciences, followed by management sciences and humanities. At this juncture, further elaboration is warranted: the humanities encompass disciplines related to languages, literature, and the arts, whereas the social sciences include fields such as media studies, communication, international relations, sociology, and anthropology.

As the data were collected using purposive sampling methods, the distribution of respondents across subject areas was not even. Notably, the number of respondents from the health sciences is very limited.

Major Subject

		Frequency	Percent
Valid	Social Sciences	147	23.1
	Applied Sciences	147	23.1
	Management	137	21.5
	Humanities	106	16.7
	Health Sciences	99	15.6
	Total	636	100

Table 6: Subject area of the respondents

The table above presents data from respondents who are distributed across roughly comparable strata. As the data were collected using purposive sampling, meaning that

respondents were drawn from youth populations across intentionally defined strata, the sample encompasses nearly all five distinct subject area backgrounds related to the respondents' academic disciplines.

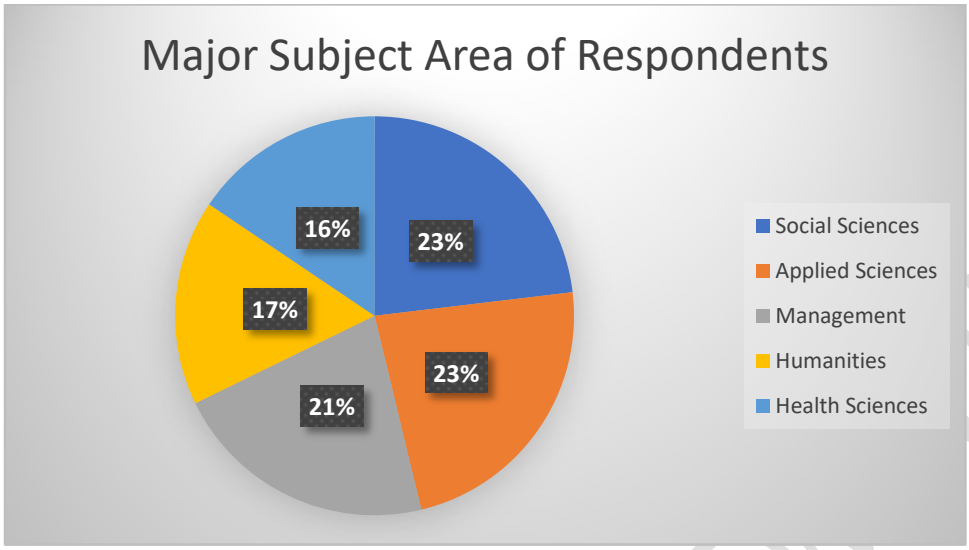

Figure 6: Subject area of the respondents

It was considered essential to inquire about the major subject area of the youth respondents. Prior research and review of the literature have concluded that higher levels of education are associated with a greater inclination to remain updated on health communication. Additionally, the literature suggests that individuals in health-related fields or major subject areas are more likely to actively seek knowledge or information pertaining to health communication, regardless of the type of media utilized.

9.7 Monthly Household Income of the Respondents

The monthly income of respondents was identified as an important and crucial variable for establishing linkages with health communication. As noted previously, the majority of the youth sample falls within the 21-to-26-year age range, which is also reflected in the finding that most students are at the under graduate level of education.

Monthly Income

		Frequency	Percent
Valid	Less than 100,000PKR	245	38.52
	100,000PKR	50	7.86
	165,000PKR	45	7.08
	230,000PKR	29	4.56
	Over 330,000PKR	15	2.36
	Missing	70	11.01
Total	Total	636	100

Table 7: Monthly Income of the respondets

That is obvious to note in the above table that majority of the respondents are having the household income below 165,000 PKR. That is also an indication that majority of the population in the province having low household income.

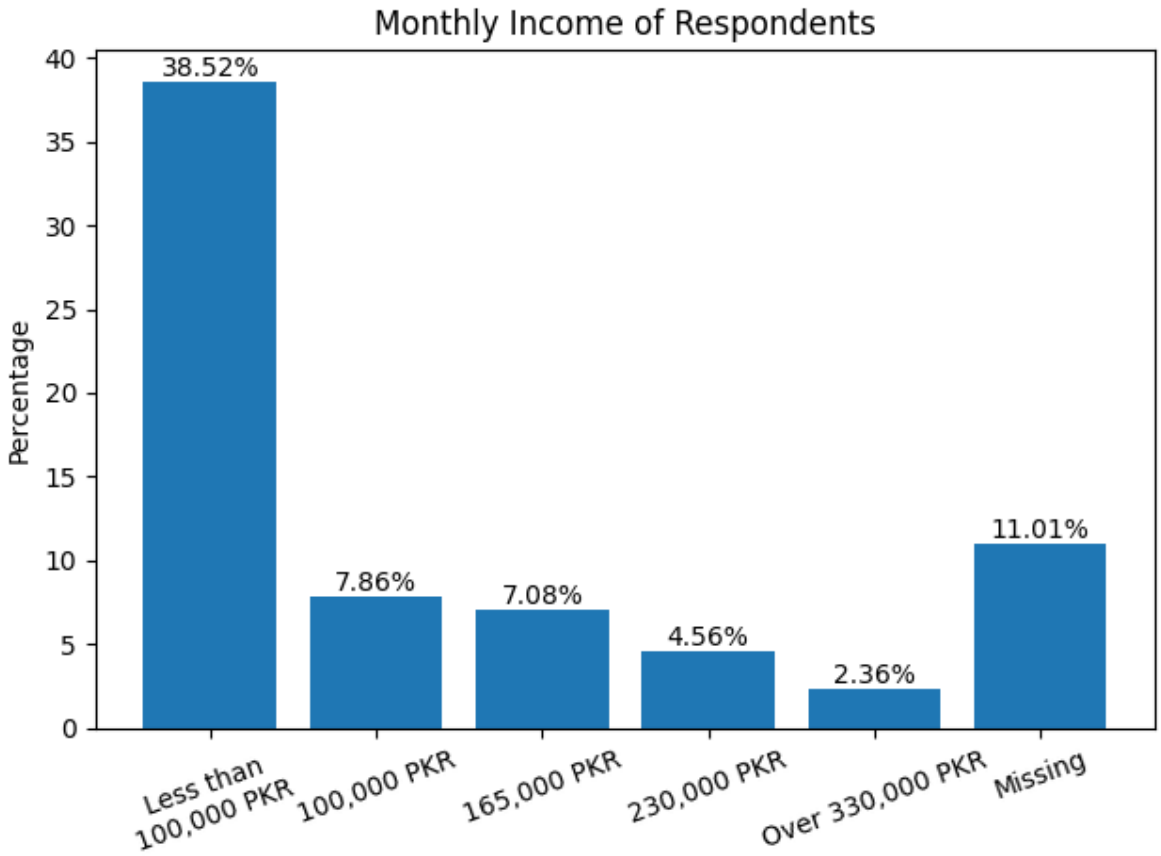

Figure 7: Analysis of Monthly Income of Respondents

As illustrated in the graph above, the majority of respondents reported a monthly household income of less than 100,000 PKR. This question was included based on the premise that income status has a direct link or association with staying informed about health communication. The variable has been employed in numerous past health communication studies, and the existing literature has consistently established a strong correlation between income and health communication outcomes.

9.8 Total Number of Family Members

The total number of family members is considered to have a direct relationship with health communication, including the acquisition of health-related information and staying updated on global health issues. Informed by previous literature, it was decided to include this question in the questionnaire. However, an important methodological consideration must be noted: there is a possibility that respondents may not have fully understood the question. Specifically, the term 'family' was not clearly defined or operationalized in the instrument. Consequently, respondents may have been uncertain whether the question referred to family members residing in the same household or those living in different locations. Additionally, ambiguity may have arisen regarding the inclusion of extended family members, such as grandparents, in the total count.

Given these potential ambiguities, it would be prudent not to examine the relationship between respondents' family size and their overall health communication information updates.

Family Members

		Frequency	Percent
Valid	3 to 4	89	13.99
	5 or above	479	75.31
	1 to 2	12	1.89
	Missing	56	8.81
	Total	636	100

Table8: Total number of family members from the respondents

The data in the above table indicate that the majority of respondents reported having more than five family members. Approximately 9% of the data on this variable are missing from the respondent sample.

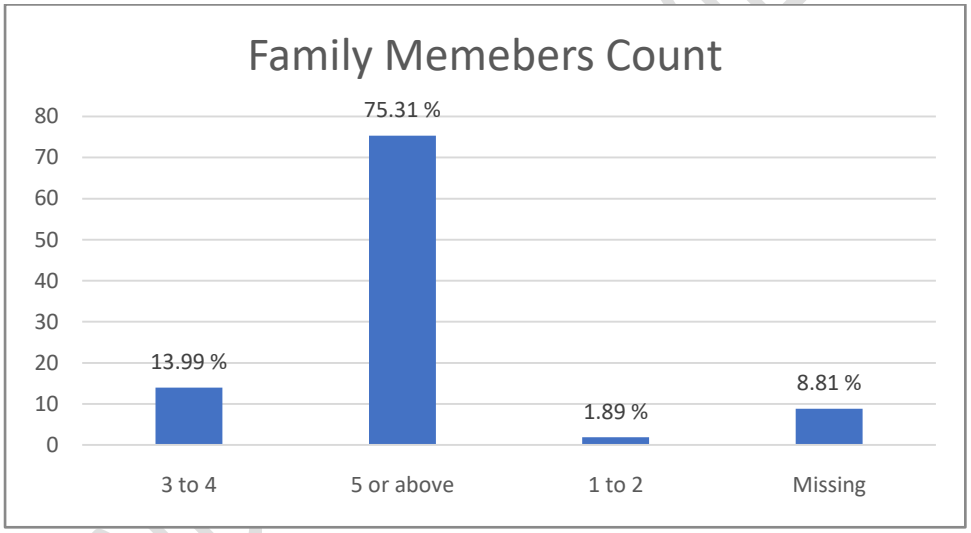

Figure 8: Analysis of family members from the respondents

Nevertheless, it is both important and pertinent to note that the total number of family members exhibit a direct link and association with health-related information and health communication. The indicators are sufficiently robust to suggest that a larger family size is positively associated with greater engagement with health-related information.

9.9 Last Visit to the Doctor

Last Visit to the Doctor

		Frequency	Percent
Valid	Last 3 Months	45	7.1
	Last 6 Months	98	15.4
	More than 12 Months	328	51.6
	Last 12 Months	120	18.9
	Missing	45	7.1
	Total	636	100

Table9: Visit to the doctor in the last 12 months

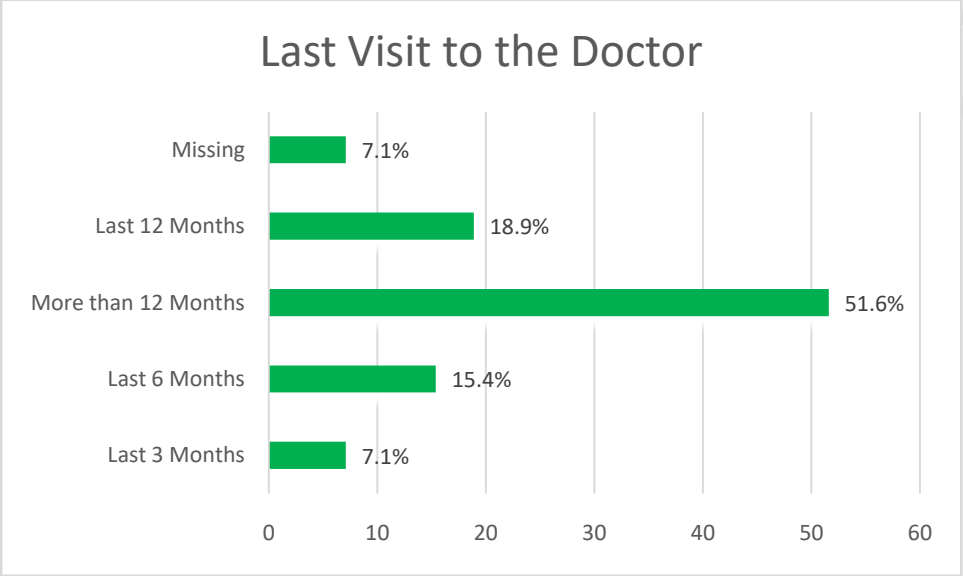

Figure 9: Visit to the doctor in the last 12 months

The analysis reveals that the majority of respondents (51% of the total sample) reported not having visited a doctor in the past 12 months. Approximately 19% of respondents indicated that they had consulted a doctor during the same 12-month period. Slightly more than 15% of respondents had visited a doctor within the preceding three months, while an additional 7% of responses were missing for this question. The data suggest that the frequency of doctor visits among the respondents is relatively low, implying that medical consultation is likely sought primarily in response to serious health issues.

9.10 Mass Media Used by the Respondents

Media Usage

		Frequency	Percent
Valid	Online Media	262	41.19
	Print Media	250	39.31
	Broadcast Media	86	13.52
	Missing	38	5.97
	Total	636	100

Table10: Mass Media Usage preference of the respondents

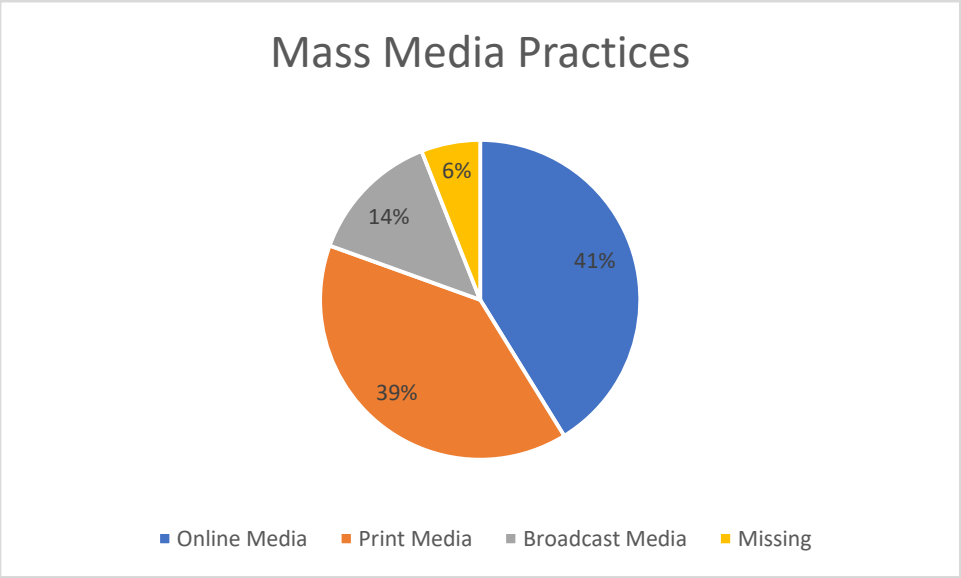

Figure 10: Analysis of Mass Media Usage preference of the respondents

The analysis of respondents' mass media usage patterns indicate that the majority of youth are engaged with both online and print media. The proportions of respondents who primarily use print media and those who use online media are approximately equal.

Consistent with findings from previous research and as hypothesized in this study, greater youth engagement with online media is associated with being more up to date with general media information, including healthcare information. It was further posited that respondents who are predominantly connected to online media and who acquire everyday life information through such platforms are likewise more likely to remain informed about health-related information via online media.

9.11 Usage of Social Media by the Respondents

To summarize the data collection process, information was not collected individually regarding respondents' specific social media usage patterns. Rather, the primary focus was to

assess the type of different media, particularly social media with which the youth are engaged. It was therefore assumed that the majority of respondents use all or at least one type of social media. Only approximately 3% respondents either did not prefer to respond to this question or had missing data for this variable.

Social Media Use

		Frequency	Percent
Valid	Facebook Only	120	18.87
	Facebook and YouTube	350	55.03
	Facebook+YouTube+Instagram	143	22.48
	Missing	23	3.62
	Total	636	100.00

Table11: Social Media Usage of the respondetns

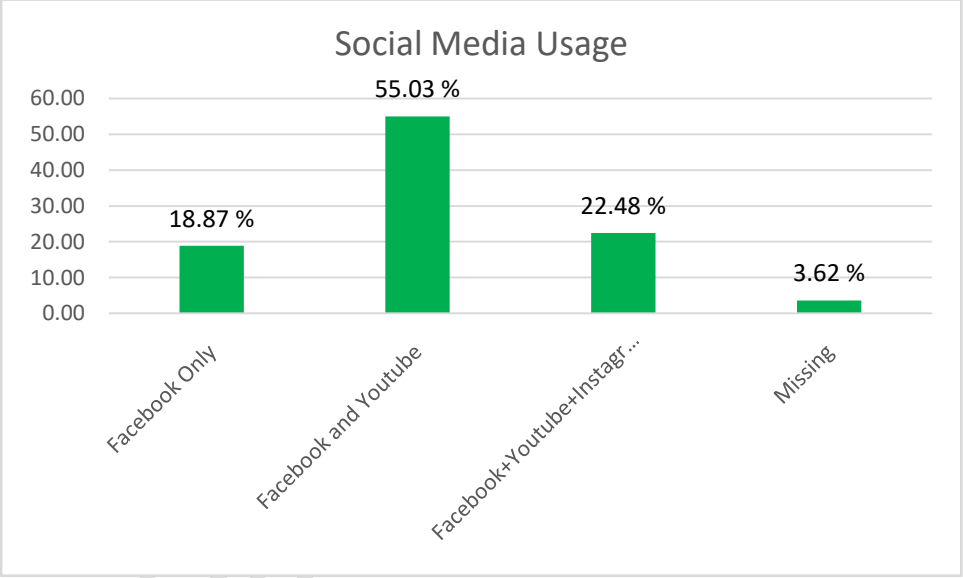

Figure11: Social Media Usage of the respondetns

The data presented in the figure above indicate that the majority of youth respondents use Facebook and YouTube collectively, suggesting engagement with nearly all types of social media available to them. Among the various platforms, Facebook and YouTube are the most frequently used ones.

The figure also reveals that respondents engage with other types of social media. A very small portion of respondents preferred not to specify which type of social media they use. Nevertheless, it is also plausible that there exists a subset of respondents who do not use any form of social media. Additionally, there is a possibility that some respondents primarily rely on other types of media for their everyday information updates, particularly concerning health-related matters.

9.12 Heavy and Light Internet Users

Internet Usage

		Frequency	Percent
Valid	4 Hours	118	18.6
	3 Hours	167	26.3
	Over 5 hours	156	24.5
	2 Hours	89	14.0
	Less than 1 Hour	56	8.8
	Missing	50	7.9
	Total	636	100

Table12: Patterns of Interenet Usage in hours by the respondents

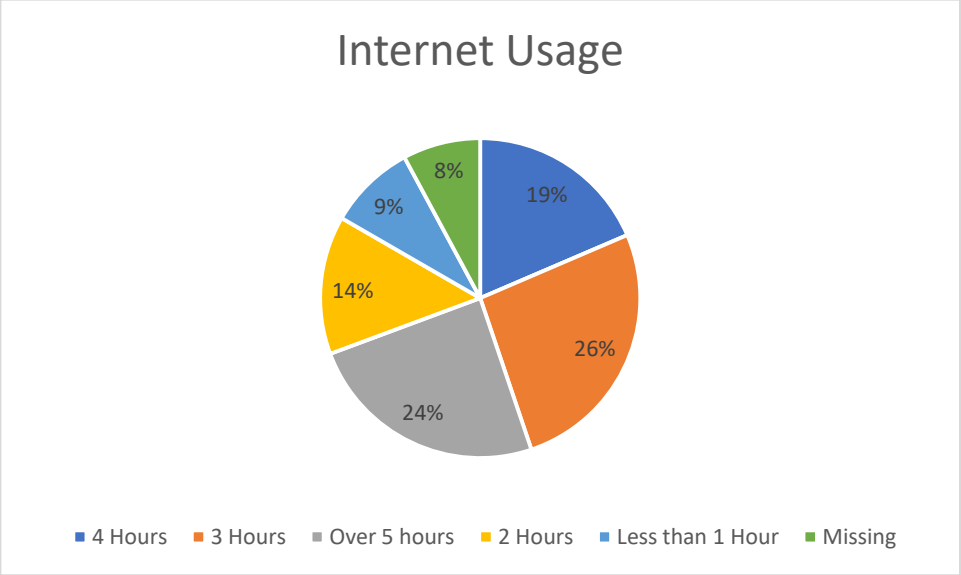

Figure12: Patterns of Interenet Usage in hourse by the respondents

As illustrated in the figure above, the majority of respondents reported using the internet for three hours per day. This is followed by respondents who use the internet for over five hours daily, and then those who use it for four hours per day. In contrast, a relatively small proportion of youth reported using the internet for less than one hour per day. The data clearly indicate that respondents use the internet for various purposes, and the daily duration of internet usage is not insubstantial.

9.13 Respondents' perception about media exposure

Exposed to Media

Exposed to Media			
		Frequency	Percent
Valid	Disagree	256	40.3
	Strongly Disagree	183	28.8
	Agree	107	16.8
	Neutral	71	11.2
	Strongly Agree	13	2
	Missing	6	0.9
	Total	636	100

Table13: Media Exposure and Agreement level of respondents

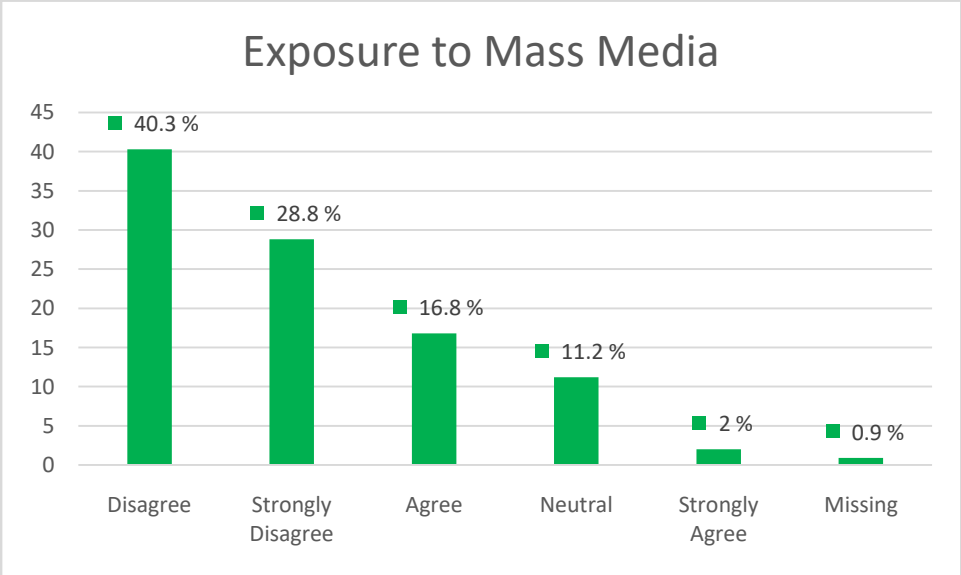

Figure13: Media Exposure and Agreement of respondents

The diagram above presents data on respondents' media exposure, which was measured using a Likert scale. The majority of respondents indicated that they disagree with the statement that they use media for information and educational purposes.

A review of the literature revealed that individuals are exposed to various types of media for a range of reasons. The purpose of including this question was to measure and evaluate the extent to which respondents willingly seek to connect with and be exposed to media for different motivation. The most commonly cited reasons for media engagement were information, education, and entertainment. Accordingly, this question was also included to examine the nature of the attachment individuals have to media exposure.

9.14 Respondents Media Use Habits for Health-Related Information

Exposed to Health-Related Information

		Frequency	Percent
Valid	Strongly Disagree	285	44.8
	Disagree	151	23.7
	Neutral	149	23.4
	Agree	27	4.2
	Strongly Agree	15	2.4
	Missing	9	1.4
	Total	636	100

Table14: Media usage for Health Related Information, respondents

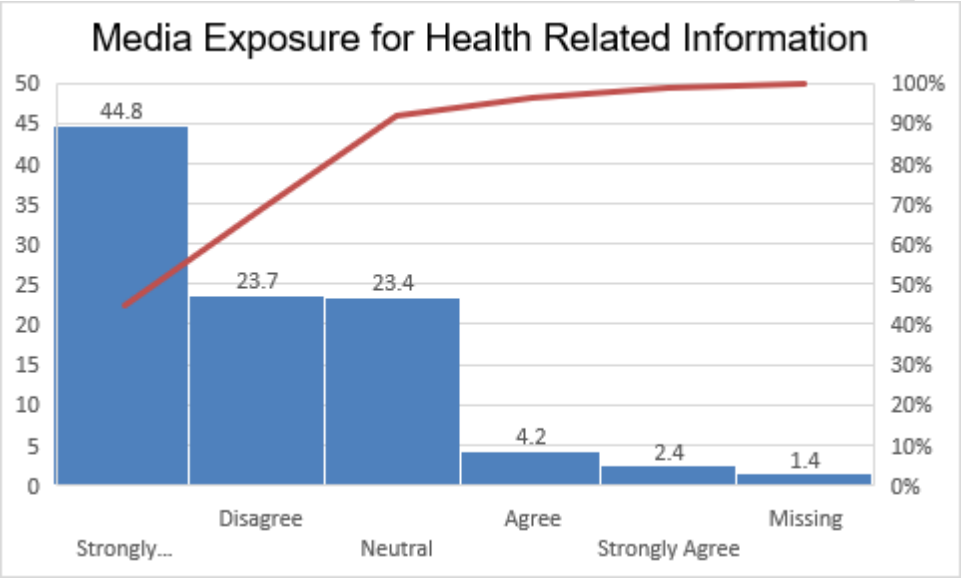

Figure14: Media usage for Health Related Information

One of the most critical questions evident in the literature pertained to how individuals seek to remain updated through media and communication. The analysis yields somewhat surprising results: the majority of respondents (44%) strongly disagree with the notion that they expose themselves to media for health-related information. It is also important to note that very few respondents engage with media for such purposes. Specifically, only 4% of respondents agree, and 2% strongly agree, that they interact with media to obtain health-related information.

9.15 Confidence for Sharing Health Related Issues

Confidence for Sharing Health Issues

		Frequency	Percent
Valid	Doctor	366	57.5
	Parents	147	23.1
	Friends	93	14.6
	Classmates	21	3.3
	Others	6	0.9
	Missing	3	0.5
	Total	636	100

Table15: Confidence for Sharing Health related issues

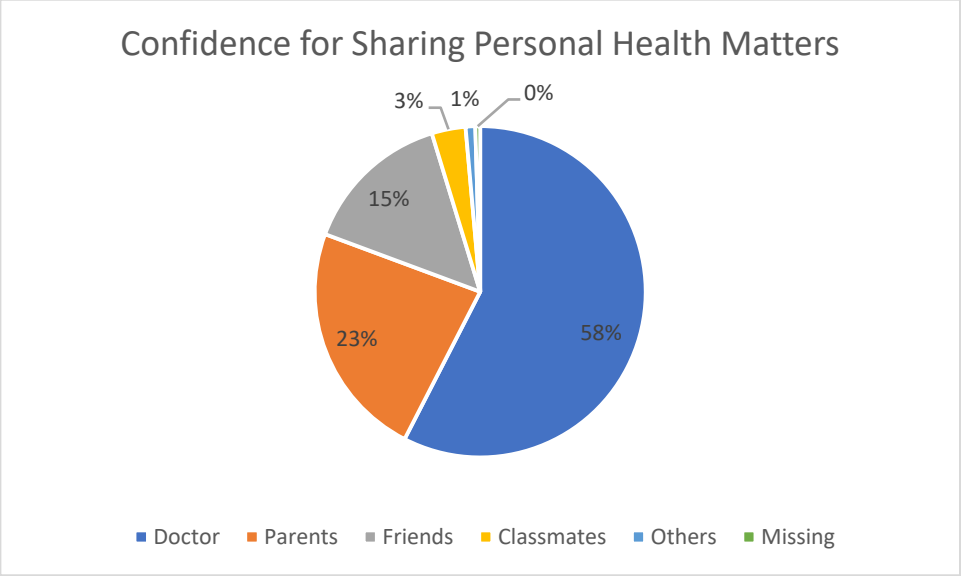

Figure15: Confidence for sharing health matters

Previous research has repeatedly identified individuals' confidence and ability to share their health information as a crucial area of inquiry. The majority of respondents reported that they discuss their health-related matters with doctors and parents. In contrast, very few respondents indicated that they discuss personal health issues with friends. This finding further implies that respondents tend to share health-related concerns with a limited number of confidants, and that discussions with friends or individuals other than parents and doctors occur infrequently.

9.16 Respondents Perception about Country'sHealth-Related issues

The question was asked from the respondents about their overall understanding of major health issues of the country.

Country Health Issues – Perception of Respondents

		Frequency	Percent
Valid	Diabetes	271	42.6
	Hepatitis	171	26.9
	AIDS	101	15.9
	Typhoid	73	11.5
	Pneumonia	9	1.4
	Others	8	1.3
	Missing	3	0.5
	Total	636	100

Table16: Respondents Perception about Health Issues in the country

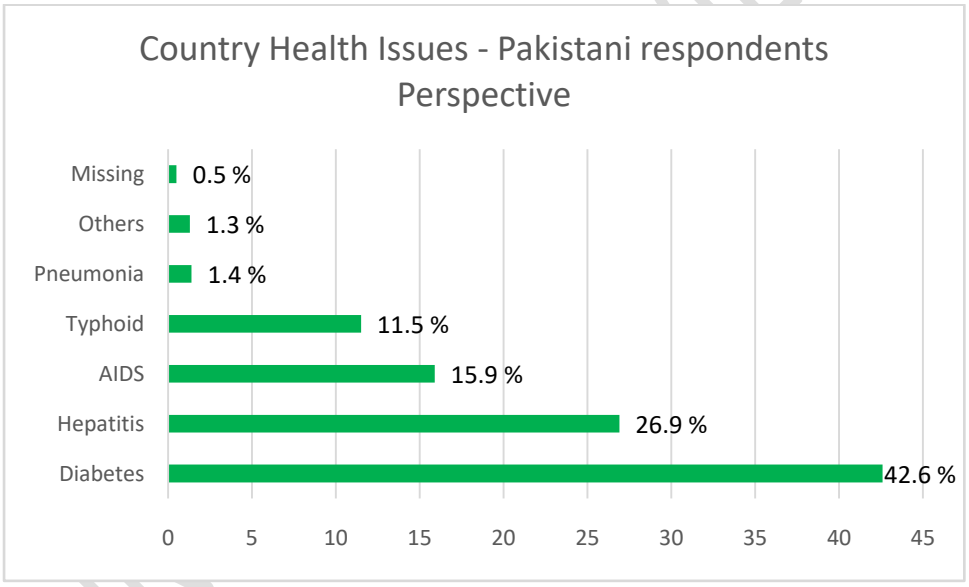

Figure16: Respondents Perception about Health Issues in the country – Pakistan

As presented in the table and graph above, responses were collected using closed-ended questions. Informed by the perspective of the ministry of Health and as reported by physicians in interviews, respondents were asked about five major diseases considered prominent in Pakistan. According to the respondents' perspective diabetes, hepatitis and AIDS were identified by respondents as among the most significant health issues facing by the country.

9.17 Provincial Capital City (Peshawar) Health Issues

		Frequency	Percent
Valid	Hepatitis	282	44.3
	Typhoid	138	21.7
	Diabetes	112	17.6
	AIDS	40	6.3
	Pneumonia	35	5.5
	Others	23	3.6
	Missing	6	0.9
	Total	636	100

Table17: City Health Issues a Perspective from the respondents

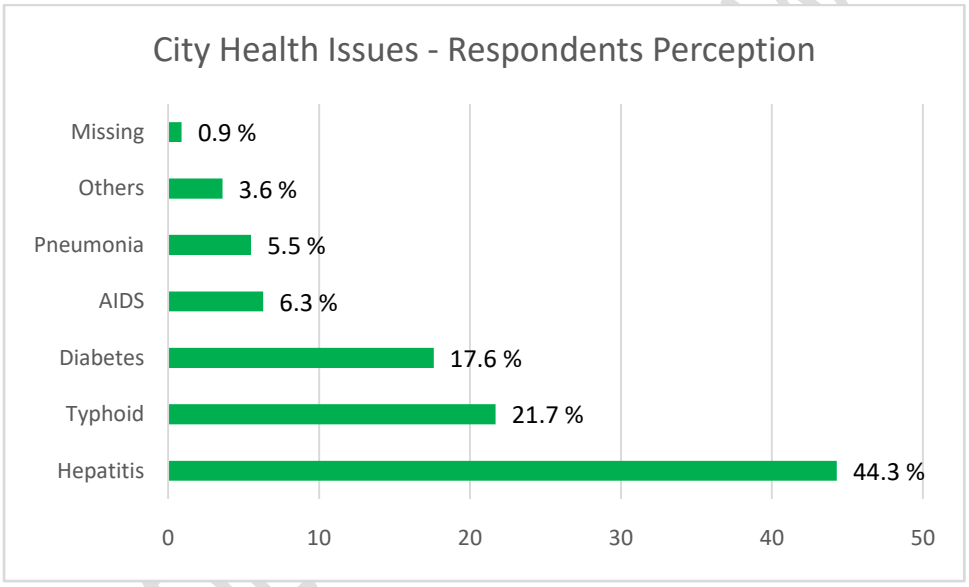

Figure17: City Health Issues a Perspective from the respondents

As illustrated in the table and diagram above, the responses from sample population were largely consistent with the respondents' perceptions of national health issues. Furthermore, based on the respondents' knowledge, the health issues considered most significant in the provincial capital city (Peshawar) were broadly similar to those identified at the national level.

Respondent Demographics (Table 1)

A total of 636 respondents participated in the survey, of whom 56.1% were male and 43.9% female. The largest age group was 21-23 years, comprising 43.9% of the sample,

followed by those aged 18-20 years at 22.3%. The majority of respondents (76.1% were single. Regarding awareness sources, 39.9% reported obtaining health information through social media. Undergraduate students constituted the majority of participants (92.5%)

Academic discipline (Table 7)

Respondents were distributed across academic disciplines as follows: Social Sciences 23.1%, Applied Sciences 23.1 % and Management Sciences 21.5 %.

Household Income (Table 8)

The largest proportion of respondents 38.5% reported a monthly household income of less than 100,000 PKR, while 7.86% reported an income of exactly 100,000 PKR.

Family Size and doctor visits (tables 9-10)

Table 9 shows that 75.3% of respondents had five or more family members. Regarding medical consultation, 51.6% reported that their last visit to a doctor was more than 12 months ago, 18.9% indicated a visit within the last 12 months, and 15.4% reported a visit within the last year.

Media Usage Patterns (Table 11)

In an era of widespread internet usage, 41.19% of respondents reported using online media, while 39.31% continued to rely on print media for information. Only 13.52% used broadcast media.

Health Information Seeking and Trust (Table 15-16)

Regarding health-specific information (Table 15), only 4.2% of respondents agreed that they use media for this purpose, while 44.8% strongly disagreed. Furthermore, 57.5% expressed greater confidence in doctors' advice than in media coverage or information received through media channels. This pattern suggests low social media usage for health purposes and a strong reliance on interpersonal communication.

Table 16 indicates that 23.1% of respondents trusted parents as a source of health information over media outlets, reflecting the continued strength of family systems in health-related guidance. Additionally, 14.6% expressed confidence in friends for health-related information.

Perceived Major Health Issues (Table 17)

When asked to identify the most significant health issues facing the country, 42% of respondents identified diabetes, followed by hepatitis 26.9% and AIDS 15.9%.

10.Conclusion

The findings of this study indicate that netizens in the Khyber Pakhtunkhwa province of Pakistan exhibit a generally critical yet cautiously optimistic perspective toward the role of social media in health communication. While participants acknowledged the growing significance of emerging media as a platform for information dissemination, they expressed dissatisfaction with the credibility, clarity, and reliability of health-related content. Concerns regarding misinformation and ambiguity were frequently highlighted. Nevertheless,

respondents strongly emphasized that, if utilized more responsibly, both social and mainstream media could play a transformative role in elevating health issues to the forefront of governmental agendas at both federal and provincial levels.

A recurring theme in the data is the perceived lack of professional capacity within media institutions to effectively report on health matters. Participants argued that health communication requires specialized knowledge, given its inherently scientific and technical nature. Journalists, therefore, often struggle to accurately interpret and convey complex medical information. In this regard, respondents advocated for structural training and capacity-building initiatives for media professionals to enhance the quality and accuracy of health reporting.

Despite these limitations, netizens widely recognized the potential of emerging media as a powerful tool for public awareness and behavioural change. They viewed it as more accessible and convenient than traditional media, particularly due to the widespread use of smartphones and digital devices. Social media enables users to access information instantly and integrate it into their daily routine, thereby increasing its effectiveness in disseminating public health messages. Consequently, participants suggested that government-led health campaigns could achieve greater outreach and impact if strategically implemented through digital platforms.

At the same time, the study underscores structural challenges that limit the effectiveness of media in Pakistan. Respondents observed that both social and mainstream media are often driven by commercial interests rather than public welfare, which undermines their role in addressing critical sectors such as health. Furthermore, disparities in access to media, especially in rural areas characterized by low literacy levels and limited resources continue to restrict the reach and inclusivity of health communication efforts.

Another important finding relates to the role of language and content design. Participants emphasized that health information must be communicated in simple, clear and locally understood languages to ensure comprehension among diverse audiences. The use of complex medical terminology or non-native languages was identified as a major barrier, particularly for populations with limited educational backgrounds. Thus, culturally and linguistically appropriate communication strategies are essential for effective public engagement.

Importantly, respondents noted that media plays a crucial agenda-sitting role in Pakistan, where government action on public health issues is mostly contingent upon media attention and pressure. In this context, accurate and responsible reporting becomes even more critical. While social media has dominated its capacity to amplify public health campaigns and mobilize awareness, its unregulated nature also poses risks. The unchecked spread of inaccurate information can lead to confusion and potentially harmful health decisions.

This research study reveals a complex interplay between opportunity and challenge. Emerging media has significantly contributed to increasing awareness and shaping health-related behaviours among youth in Khyber Pakhtunkhwa. However, its effectiveness remains constrained by issues of credibility, lack of regulation, limited professional expertise, and unequal access. Addressing these concerns through policy frameworks, media training, and inclusive communication strategies could enable social media to function as a meaningful

agent of change, ultimately contributing to improved public health outcomes in Khyber Pakhtunkhwa.

11.Limitations of the Study

Like most inquiries within the social sciences, this study is subject to a number of conceptual and practical limitations that warrant careful acknowledgment. Despite and well-defined research design and systematic analytical approach, certain constraints inevitably shaped both the scope and outcomes of the investigation. These limitations arise not only from methodological choices but also from contextual and participant-related factors, which may influence the generalizability and interpretability of findings.

One of the primary challenges encountered was the restriction of time and financial resources. Although a longitudinal design would have been more appropriate for an in-depth empirical assessment, the study relied on a convenient sampling technique with a limited scope. This inevitably constrained the breadth of data and its potential representativeness. Furthermore, data collection in Khyber Pakhtunkhwa presented its own set of difficulties, including participants' occasional reluctance to respond, particularly to socio-demographic and family-related questions.

The relatively nascent status of health communication as a field in Pakistan also posed challenges. Many respondents demonstrated limited familiarity with the subject, and some experienced difficulty in comprehending health-related questions. Although efforts were made to ensure clarity, there remains a possibility that certain responses were provided without full understanding. Additionally, prevailing socio-political concerns and mistrust partly shaped by media narratives, led some participants to question the intent of the study, thereby affecting their willingness to engage openly.

Another limitation pertains to linguistic and contextual issues. The questionnaire, if adapted for other settings, would require careful translation not only in language but also in conceptual meaning, which demands both linguistic and subject expertise. Lastly, As the study was conducted in universities of relatively developed urban setting, the findings may not accurately reflect the knowledge and awareness levels of youth residing in rural or less developed regions of Khyber Pakhtunkhwa.

12.Recommendations for Future Research

In light of the findings and acknowledged limitations of this study, several directions for future research emerge. Health communication remains a relatively underdeveloped field in many developing contexts, including Pakistan. Its intersection with social media, however, presents a particularly promising avenue for scholarly inquiry. As digital technologies continue to expand, there is a clear need for more systematic investigations into how these platforms shape health awareness, and behaviours among diverse populations.

At the theoretical level, the field would benefit from the development of more robust and contextually grounded frameworks. Health communication is inherently interdisciplinary, yet many of its dimensions remain insufficiently theorized. Future research should therefore draw upon insights from sociology, communication studies, public health, psychology, and

information technology to construct more comprehensive models. Such efforts may help explain not only how social media is used, but also why it produces particular outcomes in different social settings.

Equally important is the need to broaden methodological approaches. While existing research often relies on student sample due to ease of access, this practice limits the generalizability of findings. Greater attention should be given to underrepresented populations, including rural communities, marginalized groups, and individuals with limited literacy. Additionally, accessing such groups poses ethical and logistical challenges. Nonetheless, doing so is essential for capturing more accurate and inclusive picture of health communication practices. At the same time, researchers must remain mindful of the inherent limitations of different methods, whether surveys, experiments, or content analysis and strive to adopt mixed or innovative designs where possible.

Another critical area for future inquiry is media and health information literacy. Despite its recognized importance in many developed countries, this concept has yet to be fully institutionalized in Pakistan. Empirical studies examining how individuals interpret, evaluate, and use health information on social media could provide valuable evidence for policy development and educational initiatives. In particular, adapting international frameworks to local linguistic and cultural contexts deserves careful consideration.

Moreover, future studies should move beyond urban centers and focus on small towns and rural areas, where access to information and levels of awareness may differ significantly. Such research studies would offer a more grounded understanding of existing disparities and the actual informational needs of vulnerable populations.

Finally, greater emphasis must be placed on the dissemination of research findings. Academic outputs are sometimes inaccessible to the very populations they intend to serve.

Scholars, therefore, need to communicate their work in clearer, more understandable language, and through platforms that reach wider audiences. Only then can health communication research move beyond theoretical contribution and become a meaningful force in improving public health outcomes.

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