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IMPACT OF ELECTROMAGNETIC RADIATION FROM MOBILE PHONES AND TELECOMMUNICATION MASTS ON COMMUNITY HEALTH AWARENESS: A CASE STUDY OF KATSINA METROPOLIS

Abdulrahman Muhammad*[1], Abba Inuwa Danjuma[2] and Abubakar Usman[3]

[1]Department of Basic and Applied Science

Hassan Usman Katsina Polytechnic, PMB 2052, Katsina. Katsina State, Nigeria.

[2]Department of General Studies

Hassan Usman Katsina Polytechnic, PMB 2052, Katsina. Katsina State, Nigeria.

[3]Department of Mathematics and Statistics

Hassan Usman Katsina Polytechnic, PMB 2052, Katsina. Katsina State, Nigeria.

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***Corresponding Author: Abdulrahman Muhammad**

Department of Basic and Applied Science, Hassan Usman Katsina Polytechnic, PMB 2052, Katsina. Katsina State, Nigeria.

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ABSTRACT

The rapid proliferation of mobile phones and telecommunication infrastructure has increased public exposure to electromagnetic radiation (EMR), raising concerns about its potential effects on human health. This study examines the impact of electromagnetic radiation from mobile phones and telecommunication masts on community health awareness in Katsina Metropolis, Katsina State, Nigeria. A descriptive survey research design was adopted, utilizing structured questionnaires and interviews to assess the level of awareness, perceptions, and health-related concerns among residents. Data were collected from selected communities within the metropolis and analyzed using descriptive statistical tools. The findings reveal varying levels of awareness regarding electromagnetic radiation and its possible health implications, with a significant proportion of respondents demonstrating limited scientific understanding despite frequent exposure to mobile phone usage and proximity to telecommunication masts. The study also identifies key factors influencing awareness, including educational background, access to information, and media exposure. The research concludes that although mobile telecommunication services are indispensable, public knowledge of electromagnetic radiation risks remains inadequate. It therefore recommends enhanced public sensitization, regulatory enforcement, and collaboration

between health agencies, policymakers, and telecommunication providers to promote safer usage practices and informed decision-making.

KEYWORDS: Electromagnetic Radiation, Mobile Phones, Telecommunication Masts, Health Awareness

1. INTRODUCTION

In recent decades, the proliferation of mobile communication technologies has revolutionized connectivity worldwide. Nigeria has experienced rapid expansion in mobile network infrastructure, with an increasing number of base transceiver stations (BTS) now sited in both urban and residential zones (Arinze, Okafor, & Onah, 2021; Sanusi Kazaure & Matthew, 2021). Despite international assurances from the World Health Organization (WHO) and regulatory bodies that the electromagnetic fields (EMF) generated by mobile phones and telecommunication masts fall within safety thresholds, public concern about potential health effects continues to grow (Institute of Medicine and Safety; WHO fact sheet cited in ITEdgeNews, n.d.). Electromagnetic radiation associated with mobile devices and BTS operates within the non-ionizing frequency spectrum, primarily in the radiofrequency (RF) and microwave ranges (WHO; IARC, 2011). While non-ionizing radiation is generally considered less hazardous than ionizing types (e.g., X-rays, gamma rays), it can still induce thermal effects and tissue heating, particularly with prolonged exposure or close proximity to sources (Wikipedia, 2025). The International Agency for Research on Cancer (IARC) classified RF-EMF as “possibly carcinogenic to humans” (Group 2B) in 2011, citing limited but not definitive evidence linking RF exposure to malignancies such as glioma and acoustic neuroma (Wikipedia, 2025).

Beyond technical assessments, community awareness and perceptions of electromagnetic radiation significantly influence public behavior and acceptance. Studies in Nigeria and neighboring regions have highlighted that many residents report symptoms like headaches, fatigue, and sleep disturbances, often attributing these to exposure from mobile towers or handheld devices even when objective measurements show RF levels within safety limits (Owolabi et al., 2021; Abraham & Yunusa, 2024; Takyi et al., 2021). For instance, in North-West Nigeria, uptake of radiation-related knowledge is mixed, with some groups demonstrating average awareness yet still associating vague health complaints with RF exposure (Owolabi et al., 2021). Similarly, a study among medical students in Makurdi found high awareness of mobile phone radiation, but many still engaged in potentially risky

behaviors such as lengthy calls or placing phones near the body during sleep (Chia et al., 2022).

When combined, these results highlight the significance of both community health awareness and empirical exposure measurement in comprehending and controlling the public health effects of mobile technology. In urban areas like Katsina Metropolis, where modernity and a dense population boost exposure potential and the need for community-focused research, they are especially pertinent.

1.1 Public Health Implications of Telecommunication Mast Siting in Nigeria

The rapid expansion of telecommunication services following the introduction of the Global System for Mobile Communication (GSM) in Nigeria has led to the indiscriminate erection of telecommunication masts in residential areas. Telecommunication masts are essential for high-volume data transmission, security, and communication efficiency; however, their close proximity to human habitation has generated serious health and environmental concerns (Antonelli et al., 1991; Osaretin, 2011). Several studies have reported adverse health effects associated with exposure to electromagnetic radiation emitted from telecommunication masts. Abdel-Rassoul et al. (2007) observed that residents living near mobile phone base stations experienced short-term memory loss, sleep disturbances, headaches, increased leukemia incidence, and accelerated cancer growth. These health effects are often exacerbated by environmental pollution caused by noise, vibration, and fumes from standby power generators used at mast stations. Supporting these findings, Onifade et al. (2011) established a significant relationship between the location of telecommunication masts and the health status of residents in urban areas. Similarly, Santini et al. (2003) reported clusters of cancer cases and other illnesses among individuals living in close proximity to cellular phone base stations in Europe, leading to the removal of some installations. Regulatory agencies such as the National Environmental Standards and Regulations Enforcement Agency (NESREA) have therefore cautioned against erecting telecommunication masts near residential buildings due to potential health hazards.

1.2 Impact of Telecommunication Mast Exposure on Students' Study Habits

Study habit is a crucial determinant of students' academic performance and refers to the consistent patterns of behavior adopted during learning activities (Nuthana & Yenagi, 2009). A conducive learning environment plays a vital role in promoting effective study habits, while environmental disturbances such as noise and vibration negatively affect concentration

and comprehension. Empirical studies have demonstrated a strong relationship between study habits and academic achievement. Osa-Edoh and Alutu (2012) found a high correlation between effective study habits and students' academic performance. Similar findings were reported by Fazal et al. (2012), Nonis and Hudson (2006), and Yang and Bliss (2014), who emphasized that environmental and psychological factors significantly influence students' learning outcomes.

Environmental disturbances associated with telecommunication masts, particularly noise and vibration from generators, have been linked to reduced concentration, fatigue, dizziness, stress, and sleep disorders among students (Abdel-Rassoul et al., 2007). These conditions impair students' ability to sustain prolonged study periods and negatively affect academic engagement. Rösli et al. (2004) further identified headaches, stress, fatigue, and concentration difficulties as common complaints among individuals exposed to electromagnetic radiation from base stations.

Despite these findings, the Nigerian Communications Commission (NCC), aligning with the World Health Organization (WHO), has consistently maintained that there is insufficient scientific evidence linking telecommunication masts to serious health problems. This stance has contributed to regulatory violations regarding the recommended minimum distance between masts and residential buildings. Consequently, assessing students' awareness of the potential effects of telecommunication masts on their study habits remains critical, particularly in rapidly growing university communities such as Amassoma.

1.3 Residential Satisfaction and Property Value Effects of GSM Base Stations

Beyond health implications, telecommunication mast stations have been shown to influence residential property values and occupants' satisfaction. Studies have consistently found that residents' perceptions of health risks significantly affect their willingness to pay for properties located near GSM base stations (Bond et al., 2003; Bond & Beamish, 2005). In developing countries, empirical evidence remains limited; however, Bello (2010) reported that residents' satisfaction with housing decreases as proximity to base stations increases, particularly among those who fear potential health hazards. International studies have produced mixed results. Brandt and Maennig (2012) found that only clusters of antenna masts negatively affected condominium prices, while individual masts had negligible impact. These findings suggest that perceived visual intrusion and cumulative exposure may play a critical role in shaping public attitudes toward telecom infrastructure. The presence of GSM base stations has implications for property values. Studies have shown that residents' perceptions

of health risks significantly influence rental and property values near base stations (Bond et al., 2003). Bello (2010) observed that residential satisfaction increased with distance from GSM base stations, largely due to reduced fear of health hazards. Research conducted in New Zealand and Germany revealed mixed perceptions. While some residents were willing to pay substantially less for properties near base stations, others showed neutral attitudes, particularly where exposure was perceived as minimal (Bond & Beamish, 2005; Brandt & Maennig, 2012). These findings suggest that public perception, rather than proven health impact alone, plays a critical role in property valuation near telecommunication infrastructure.

1.4 Objectives of the Study

The aim of this study is to assess the impact of electromagnetic radiation from mobile phones and telecommunication masts on community health awareness in Katsina Metropolis.

Objectives of the Study

1. To evaluate the level of community awareness and perceptions of electromagnetic radiation from mobile phones and telecommunication masts in Katsina Metropolis.
2. To investigate the health concerns and symptoms commonly associated with electromagnetic radiation by residents of Katsina Metropolis.
3. To analyze the relationship between community awareness, demographic factors, and the acceptance of telecommunication infrastructure.

2. Literature Review

2.1 Electromagnetic Radiation Exposure from Mobile Phone Base Stations: Systemic and Salivary Health Effects

The rapid global expansion of mobile phone usage has led to increased installation of mobile phone base stations within residential and commercial areas, raising public concern regarding potential health effects of electromagnetic radiations (EMRs). Mobile phone base stations emit non-ionizing radiofrequency electromagnetic fields (RF-EMFs), which have been widely investigated for their possible biological and health implications (Blettner et al., 2009; Schröttner & Leitgeb, 2008).

The World Health Organization (WHO) has acknowledged public anxiety surrounding long-term exposure to EMRs and has recommended systematic investigations into the health effects associated with proximity to mobile phone base stations (World Health Organization [WHO], 2011). One recognized mechanism through which microwave radiation interacts

with biological tissues is dielectric heating, wherein polar molecules oscillate in response to electromagnetic fields, leading to thermal effects in living tissues (Hermann & Hossmann, 1997). Epidemiological and observational studies have reported that individuals residing near mobile phone base stations frequently experience nonspecific health symptoms, including headaches, dizziness, sleep disturbances, irritability, and concentration difficulties (Bortkiewicz et al., 2004; Schreier et al., 2006; Szyjkowska et al., 2005). Additionally, exposure to radiofrequency EMFs has been associated with alterations in blood pressure and impaired cognitive function, suggesting potential systemic health consequences (Braune et al., 1998). Beyond general health effects, emerging evidence indicates that EMRs may influence oral health, particularly salivary gland function. Saliva plays a critical role in maintaining oral homeostasis by facilitating lubrication, buffering acids, antimicrobial defense, and remineralization of dental tissues (Mandel, 1989; de Almeida et al., 2008). Any quantitative or qualitative alteration in salivary secretion may predispose individuals to dental caries, oral infections, mucositis, dysphagia, and halitosis (Atkinson & Wu, 1994; Sonies et al., 1989). Salivary buffering capacity, largely dependent on bicarbonate concentration, is a key protective mechanism against dental demineralization (Bardow et al., 2000). Reduced salivary flow rates have been consistently associated with increased caries risk and compromised oral health (Heintze et al., 1983; Wikner & Söder, 1994). Studies investigating radiosensitivity of salivary glands further suggest that electromagnetic and ionizing radiation may impair glandular function through cellular and vascular mechanisms (Konings et al., 2005).

In this context, Singh et al. (2016) conducted a cross-sectional study to evaluate the effects of EMRs emitted from mobile phone base stations on general health and salivary function among residents in Jaipur, India. Their findings demonstrated a significantly reduced stimulated salivary flow rate and a higher prevalence of sleep disturbances and neurological complaints among individuals living near base stations compared to those residing farther away. These results support growing concerns that prolonged exposure to EMRs from mobile phone towers may pose risks to both systemic and oral health, warranting further large-scale and longitudinal investigations.

2.2 Community Awareness, Perceived Risks, and Scientific Debate on Telecommunication Radiation

Concern over the possible biological and psychological impacts of non-ionizing radiation from telecommunications masts and cell phones is becoming more widespread worldwide,

according to research on electromagnetic radiation and community health awareness. Public knowledge varies, and there are frequently misconceptions, according to studies done in Nigeria and other poor nations (Abraham & Yunusa, 2024). For instance, Chia et al. (2022) reported that while medical students in Makurdi demonstrated awareness of mobile phone radiation, their knowledge of actual health risks was limited. Similarly, Arinze, Okafor, and Onah (2021) emphasized that despite compliance with regulatory standards, communities in Nigeria remain anxious about the siting of telecommunication masts. Telecommunication masts have been studied from various perspectives, but research addressing their broader implications has received relatively limited attention. For instance, Akin (2014) investigated the adequacy of mast locations and their impact on residents' livability in Osogbo, Nigeria, and reported that residents perceived physical, health, and environmental challenges depending on their proximity to the masts. Similarly, Akintonwa et al. (2009), through a descriptive cross-sectional survey, assessed the potential health hazards of non-ionizing radiation from telecommunication masts on exposed communities and confirmed that radiation exposure poses health risks, emphasizing the need for mitigation strategies to enhance healthy living. Furthermore, the combined hazards of improperly sited telecommunication masts alongside high-voltage power lines could present additional safety concerns.

Mobile phones play a crucial role in facilitating social interaction and relationship management (Banjo, Hu, & Sundar, 2008); however, concerns persist regarding the potential health effects of non-ionizing radiation emitted by GSM base stations and handsets. Scientific and environmental bodies present conflicting views on these risks (Yusuf, 2003). Some studies suggest possible adverse effects, including disruption of brain electrical activity (Hamblin & Wood, 2002), ecological impacts that may signal human health risks (Fernie, 2005), and associations with cancers, cardiovascular disorders, and sleep or cognitive disturbances (Cherry, 2009). In contrast, other research reports no significant health effects from residential proximity to GSM masts, with experimental studies showing no adverse outcomes (Changnuad et al., 1999) and reviews finding insufficient evidence of cancer or tumors, despite headaches being commonly reported (Akintonwa et al., 2009; Antonelli, 1991). Regulatory evaluations, such as those by the Health Council of the Netherlands, further reflect the ongoing scientific debate. Despite these controversies, telecommunication masts remain essential for reliable, high-capacity communication (Alleman, 1989). The literature indicates that public perceptions are shaped by cultural attitudes, limited sensitization efforts, and restricted access to reliable information, underscoring the need to

bridge the gap between scientific evidence and community beliefs for effective public health communication and sustainable infrastructure deployment

3. Research Method

3.1 Description of the Study Area

This study was conducted in Katsina Metropolis, the capital city of Katsina State in northwestern Nigeria. Katsina Metropolis is an urban center characterized by high population density, growing commercial activity, and rapid expansion of telecommunication infrastructure to meet the increasing demand for mobile connectivity. The city is estimated to have a population of over 400,000 people, with diverse socio-economic and educational backgrounds. Numerous telecommunication masts are sited in both residential and commercial areas, making the metropolis an appropriate setting for assessing community awareness and perceptions of electromagnetic radiation.

3.2 Statistical Analysis

The study utilized descriptive statistical techniques to analyze data collected from questionnaires and interviews, ensuring completeness and consistency. Key methods included frequency distributions, percentages, tables, and charts to summarize demographic characteristics and assess community awareness and perceptions of electromagnetic radiation (EMR) from mobile phones and telecommunication masts. Cross-tabulation compared responses across variables like age and education to identify trends. The findings, presented in clear formats, supported reliable conclusions and informed recommendations for public health awareness and policy.

3.3 Data Collection

The study adopt a cross-sectional survey design using a structured questionnaire as the main instrument for primary data collection. The questionnaire was divided into sections covering: Demographic information, Awareness and knowledge of electromagnetic radiation from mobile phones and telecommunication masts, Perceptions and beliefs about health risks associated with exposure to electromagnetic radiation, reported symptoms or experiences attributed to mobile phone use or proximity to telecommunication masts. A sample size of respondents was selected using stratified random sampling to ensure representation from different neighborhoods in Katsina Metropolis, particularly those located close to telecommunication masts and those farther away. Data was also collected through face-to-face administration of questionnaires, with trained research assistants assisting respondents where necessary.

4. RESULT AND DISCUSSION

Table 4.1: Distribution of Respondents by Gender.

Gender	Frequency	Percentage (%)
Male	214	55.6
Female	171	44.4
Total	385	100.0

The distribution of respondents by gender shows that males constituted a slightly higher proportion of the study population, accounting for 55.6% of the respondents, while females represented 44.4%. This indicates that both genders were reasonably well represented in the survey, although male participation was somewhat more dominant. The relatively balanced gender composition suggests that the data captured perspectives from both men and women living within Katsina metropolis, which is important for a study focusing on community health awareness. Since exposure to electromagnetic radiation from mobile phones and telecommunication masts affects the entire population regardless of gender, the inclusion of a substantial number of female respondents strengthens the credibility and inclusiveness of the findings. The implication of this gender distribution for the research is that the observed levels of awareness and perceived health effects of electromagnetic radiation are likely to reflect general community perceptions rather than being skewed heavily toward one gender. However, the slight dominance of male respondents may also indicate higher male availability, participation, or engagement in issues related to technology and telecommunication infrastructure within the study area. This has implications for public health communication strategies, as awareness campaigns on electromagnetic radiation should be designed to equally target both men and women, ensuring that females—who make up a significant portion of the population are adequately reached. Overall, the gender distribution supports the validity of the study's conclusions on community health awareness while highlighting the need for gender-sensitive approaches in policy formulation and health education related to electromagnetic radiation exposure.

Table 4.2: Distribution of Respondents by Age Group.

Age Group (Years)	Frequency	Percentage (%)
Below 20	58	15.1
20–29	132	34.3
30–39	104	27.0
40 and above	91	23.6
Total	385	100.0

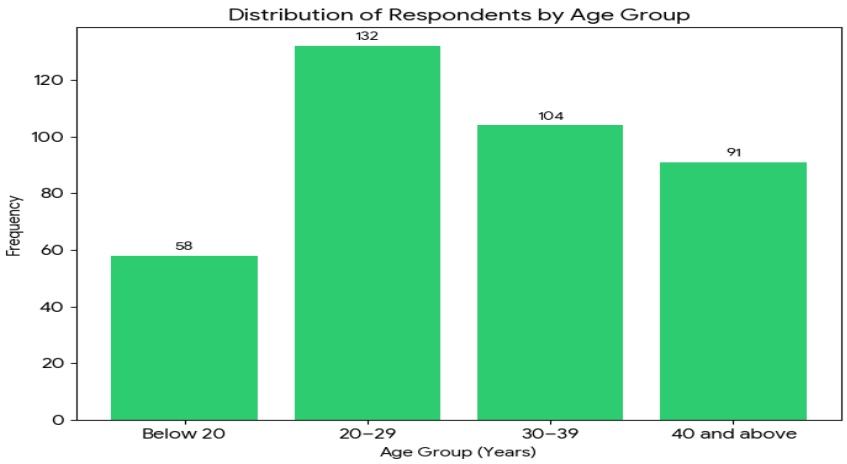

Figure 4.1: The distribution of respondents by age group.

The distribution of respondents by age group in Table 4.2 shows that the largest proportion of participants falls within the 20–29 years age bracket, accounting for 34.3% of the total respondents. This is followed by those aged 30–39 years, who make up 27.0%, while respondents aged 40 years and above constitute 23.6%. The least represented group is respondents below 20 years, accounting for 15.1% of the study population. This pattern indicates that the study largely captured the views of young and middle-aged adults, who are typically more active users of mobile phones and more exposed to telecommunication services in daily life. The implication of this age distribution for the research is that the findings on awareness and perceived health effects of electromagnetic radiation are likely to be strongly influenced by the experiences and perceptions of economically active and technologically engaged age groups. Younger adults, particularly those between 20 and 39 years, are more likely to use mobile devices extensively and to be aware of issues surrounding electromagnetic radiation, which may heighten their sensitivity to potential health concerns. At the same time, the inclusion of respondents aged 40 years and above ensures that the perspectives of older residents who may have different health perceptions and levels of risk awareness are also reflected. Overall, the age composition enhances the relevance of the study by capturing diverse age-related experiences and supports meaningful conclusions about community health awareness in Katsina metropolis

Table 4.3: Awareness of Electromagnetic Radiation.

Awareness Level	Frequency	Percentage (%)
Aware	279	72.5
Not Aware	106	27.5
Total	385	100.0

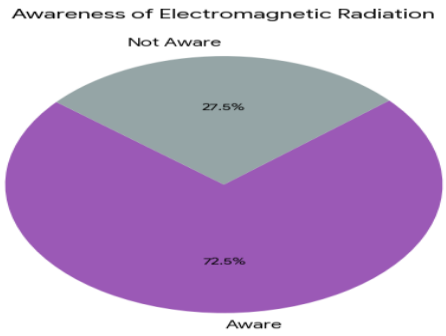

Figure 4.2: represent the awareness of electromagnetic radiation

The data in Table 4.3 reveals that 72.5% of respondents in Katsina metropolis are aware of electromagnetic radiation, while 27.5% are not. This high awareness is likely due to media exposure, personal mobile phone usage, and visible telecommunication masts. The finding is significant as it influences community perceptions and attitudes toward health risks associated with telecommunication technologies. However, the considerable minority of unaware respondents points to a gap in public knowledge, indicating a need for targeted public health education to enhance understanding and support informed decision-making regarding electromagnetic radiation and telecommunication infrastructure.

Table 4.4: Perceived Health Concerns Associated with Electromagnetic Radiation.

Health Concern	Yes (%)	No (%)
Headaches	64.2	35.8
Sleep Disturbance	58.7	41.3
Fatigue	61.0	39.0
No Health Effect	29.4	70.6

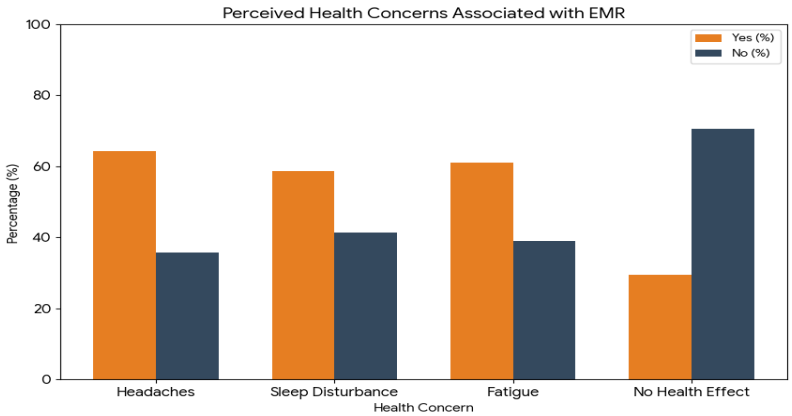

Figure 4.3: Perceived health concerns Associated with EMR.

The results presented in Table 4.4 show that a large proportion of respondents perceived electromagnetic radiation as being associated with several health concerns. Specifically, 64.2% of respondents reported headaches as a perceived health effect, 61.0% associated electromagnetic radiation with fatigue, and 58.7% linked it to sleep disturbance. These findings indicate that more than half of the study population believes that exposure to electromagnetic radiation from mobile phones and telecommunication masts may negatively affect their health, particularly in ways that influence daily functioning and overall well-being. The relatively high percentages across these health concerns suggest that electromagnetic radiation is viewed as a potential public health issue within Katsina metropolis.

In a survey, only 29.4% of respondents believed that electromagnetic radiation has no health effects, while 70.6% were skeptical about its safety, indicating widespread concern in the community. These perceptions, influenced by personal experiences and media reports, shape public attitudes toward technology and infrastructure, particularly regarding mobile phone usage and telecommunication masts. This suggests that perceived health risks drive community resistance and regulatory demands, highlighting the need for public health education, transparent risk communication, and active community engagement to address concerns about electromagnetic radiation in Katsina metropolis.

Table 4.5: Acceptance of Telecommunication Masts in Residential Areas.

Response	Frequency	Percentage (%)
Acceptable	162	42.1
Not Acceptable	223	57.9
Total	385	100.0

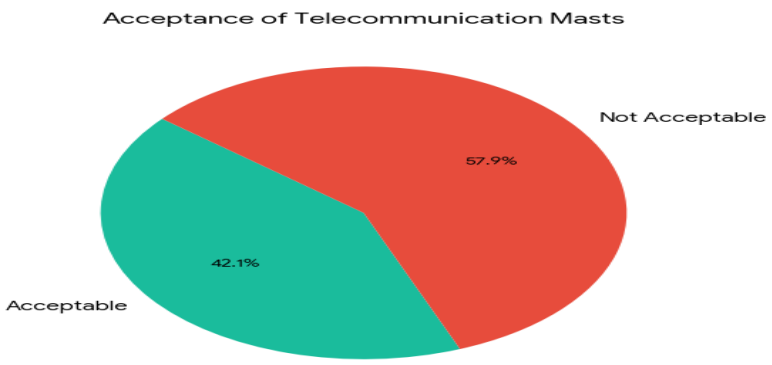

Figure 4.4: figure showing Acceptance of Telecommunication.

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Table 4.6: Chi-Square Test of Awareness and Perceived Health Concerns

Test	Value	Df	Sig. (p)
Pearson Chi-Square	11.92	1	0.001

Table 4.7: Correlation between Awareness Level and Acceptance of Telecommunication Masts.

Variables	Correlation Coefficient (r)	Sig. (p)
Awareness × Acceptance	-0.42	0.000

The result of the Chi-Square test presented in Table 4.6 indicates a statistically significant relationship between awareness of electromagnetic radiation and perceived health concerns among respondents in Katsina metropolis. The Pearson Chi-Square value of 11.92 with 1 degree of freedom and a significance level of p = 0.001 is well below the conventional 0.05 threshold. This implies that respondents' level of awareness is not independent of their perception of health effects associated with electromagnetic radiation. In other words, individuals who are more aware of electromagnetic radiation are significantly more likely to report health concerns such as headaches, sleep disturbances, and fatigue. This finding supports the assumption that awareness influences how people interpret and respond to potential environmental health risks. Table 4.7 further strengthens this relationship by showing a moderate negative correlation $(r = -0.42)$ between awareness level and acceptance of telecommunication masts in residential areas, with a highly significant $p - value\ of\ 0.000$. The negative direction of the correlation indicates that as awareness of electromagnetic radiation increases, acceptance of telecommunication masts tends to decrease. This suggests that increased knowledge or exposure to information—whether accurate or perception-based—may heighten concerns and lead to resistance toward the siting of telecommunication infrastructure near residential areas. The magnitude of the correlation

reflects a meaningful association, indicating that awareness plays a considerable role in shaping community attitudes toward telecommunication masts. The findings indicate that awareness significantly influences perceived health risks and community acceptance of telecommunication infrastructure. While awareness is important for informed decision-making, it can lead to fear and opposition if not paired with balanced, evidence-based information. Thus, policymakers and health authorities should implement structured public education programs that effectively communicate scientific evidence and safety standards regarding electromagnetic radiation to address misconceptions and enhance acceptance in Katsina metropolis.

DISCUSSION OF THE FINDINGS

The findings of this study reveal a high level of awareness of electromagnetic radiation among residents of Katsina metropolis, with a substantial majority of respondents indicating that they are aware of radiation from mobile phones and telecommunication masts. This widespread awareness appears to play a significant role in shaping public perceptions of health risks, as evidenced by the large proportion of respondents who associated electromagnetic radiation with health concerns such as headaches, fatigue, and sleep disturbances. These perceptions suggest that electromagnetic radiation is widely viewed within the community as a potential threat to health, regardless of the extent to which such effects are scientifically established. The prominence of these concerns reflects the influence of personal experiences, societal narratives, and media reports in shaping public understanding of environmental health issues.

The study further demonstrates that perceived health concerns strongly affect community attitudes toward the acceptance of telecommunication masts in residential areas. More than half of the respondents expressed opposition to the installation of masts near their homes, indicating a general lack of acceptance of such infrastructure within residential environments. This resistance is reinforced by the statistical evidence showing a significant relationship between awareness and perceived health concerns, as well as a negative correlation between awareness and acceptance of telecommunication masts. Together, these findings suggest that increased awareness, when not accompanied by clear and accurate scientific communication, may amplify fear and mistrust, leading to negative attitudes toward technological development. This underscores the complex nature of awareness, where being informed does not always translate into acceptance but may instead heighten sensitivity to perceived risks.

Overall, the findings highlight important implications for public health policy, urban planning, and telecommunication regulation in Katsina metropolis. The significant influence of awareness on health perceptions and infrastructure acceptance suggests that effective risk communication is essential in addressing community concerns about electromagnetic radiation. Health authorities and telecommunication stakeholders must prioritize transparent engagement, education, and dialogue with residents to provide balanced information on exposure limits, safety standards, and ongoing monitoring. By addressing misconceptions while respecting community concerns, policymakers can promote informed decision-making, improve public trust, and facilitate the sustainable integration of telecommunication infrastructure without compromising perceived community health and well-being.

5. CONCLUSION

Based on the findings of this study, it can be concluded that electromagnetic radiation awareness among residents of Katsina Metropolis is inadequate, despite the increasing presence of mobile phones and telecommunication masts. While telecommunication technologies have significantly improved communication and socioeconomic activities, public understanding of their potential health implications has not kept pace with their adoption.

The study further concludes that misinformation, limited public sensitization, and insufficient health education contribute to misconceptions and uncertainty regarding electromagnetic radiation exposure. Without adequate awareness, individuals may be unable to adopt precautionary measures or make informed decisions regarding mobile phone usage and residential proximity to telecommunication masts. Therefore, bridging the knowledge gap between technological advancement and public health awareness is essential.

6. RECOMMENDATION

Based on the results of this study, the following recommendations are proposed:

- Public Awareness Campaigns: Government agencies, health organizations, and regulatory bodies should intensify public sensitization programs on electromagnetic radiation, emphasizing scientifically verified information and safety guidelines.
- Health Education Integration: Topics related to electromagnetic radiation and environmental health should be incorporated into school curricula and adult education programs to improve long-term awareness.

- Regulatory Enforcement: Relevant regulatory agencies should ensure strict compliance with international exposure standards, such as those recommended by the World Health Organization (WHO) and ICNIRP, in the installation of telecommunication masts.
- Community Engagement: Telecommunication service providers should engage communities before erecting masts and provide transparent information on radiation safety and exposure limits.
- Media Utilization: Radio, television, and social media platforms should be used strategically to disseminate accurate information and counter misinformation regarding electromagnetic radiation.

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