BMC Public Health

RESEARCH

Open Access

How city living affects mental health-a qualitative exploration of urban stressors among adults in a megacity in India

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Abstract

Background India's rapid urbanization presents both opportunities and challenges, offering better healthcare and infrastructure while also impacting physical and mental health. The reasons behind the higher prevalence of mental health issues in urban areas remain underexplored, particularly in the Indian context. This study seeks to fill that gap by examining urban stressors in an Indian megacity, aiming to inform urban planning and enhance mental well-being.

Method The study involved 24 in-depth interviews with non-slum residents aged 30–60 years. Data was collected based on predefined themes, categorized into physical and social urban environments, and further analyzed into subthemes.

Results Five key urban factors were consistently reported as negatively affecting mental health: housing issues, traffic and transportation challenges, neighborhood characteristics, cost of living, and employment-related stress. Additionally, factors such as water quality and availability, air and noise pollution, solid waste management, safety concerns, social cohesion, and the accessibility and affordability of recreational facilities contributed to varying levels of distress among different participant groups.

Conclusion This study underscores the complex interaction between physical and social environmental factors in influencing mental health of residents of the city. The findings underscore the importance of adopting a multisectoral and inclusive approach to urban planning that places mental well-being at its core. Integrating mental health into city development guided by frameworks such as HiAP approach (Health in All Policies), the WHO Healthy Cities initiative, GAPS (Green, Active, Prosocial, and Safe places), among others can support the creation of inclusive and sustainable urban spaces in alignment with Sustainable Development Goal 11 (SDG 11). However, this study has certain limitations, primarily the lack of generalizability due to its qualitative design conducted in a single Indian megacity, as well as the absence of assessment of mental health outcomes using standardized mental health assessment tools.

Keywords Urbanization, Mental health, Physical environment, Social environment, Urban planning

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Background

Over the past two centuries, the global urban population has surged from about 5–50% [1]. In India, urbanization is advancing rapidly, with nearly 20 million people migrating from rural to urban area annually. By 2030, Indian cities are expected to accommodate over 400 million people [2]. While urban areas offer benefits such as improved access to employment, healthcare and services, they also present health risks, including immune dysfunction (e.g., allergies, asthma), lifestyle-related chronic diseases (e.g., cardiovascular issues, obesity), and infectious diseases (e.g., respiratory infections) [3]. Urbanization significantly impacts both physical and mental health.

Research indicates higher rates of mental disorders in urban areas, globally and in India. The 2017 Global Burden of Disease study found a strong correlation between urbanization and the prevalence of Common Mental Disorders, especially anxiety disorders [4]. Similarly, Reddy and Chandrashekar's meta-analysis reported an 80.6% prevalence of mental disorders in urban areas, compared to 48.9% in rural areas [5]. The National Mental Health Survey of India (NMHS) (2015-16) indicated a higher prevalence of any mental morbidity in urban metros (14.71%) than in urban non-metro areas (9.73%) and the national average (10.56%) [6].

Global studies are exploring reasons for higher prevalence of mental disorders in urban environment and attribute it to various physical and social factors. These include housing conditions, overcrowding, pollution, transportation challenges, limited access to green spaces, social isolation, crime and insecurity and they have been associated with increased risks of stress, anxiety, depression [7], and depressive mood [8] in urban environments [9]. However in India, research on urbanization and its impact on mental health/mental disorder is in its nascent stage and is mainly consisted of narrative reviews and opinions [10–14]. These studies tend to address specific stressors without providing the comprehensive understanding required for informed planning decisions.

By 2047, 50% of Indian's population is projected to reside in urban areas, making it vital to create health promotive environment. According to the general system dynamics model, mental illness in urban areas stems from a lack of coordination among different city systems and structures, which goes beyond healthcare provisions. Therefore it's essential to identify urban-specific stressors (stressors negatively affecting mental health) holistically and understand their interconnectedness. This understanding is key to informing a multisectoral urban planning approach that places mental health at its core [15]. To achieve this, aligning strategies between health and development stakeholders and leveraging frameworks such as HiAP approach (Health in All Policies), the WHO Healthy Cities initiative, GAPS (Green, Active, Prosocial, and Safe places)and India's SMART Cities Mission can help in designing resilient, inclusive, and sustainable urban spaces that foster mental well-being across the lifespan [16–19]. In this context, the current study aims to qualitatively explore the factors in the urban environment and understand its influence on stressful living among adults residing in select non-slum localities in Bengaluru city.

Theoretical perspective

The study adopted a thematic framework to comprehensively examine urban environmental factors, encompassing both physical and social dimensions, and their impact on the mental well-being of urban residents [20]. This framework offered a structured way to understand the complex relationship between various environmental factors and mental health, and proved especially useful in refining our interview guide after the pilot phase. Drawing from the European Environment Agency's definition, urban stress was defined as the state of bodily or mental tension developed through city living, or the physical, chemical, or emotional factors that give rise to that tension [21].

These stress-inducing factors in urban areas were termed as urban stressors. To explain how urban stressors negatively influence mental health/mental disorder, the study applied Stan Kutcher's framework and the Chronic Stress theory. Kutcher's framework links different mental health states, describing mental distress as the expression of specific feelings and words that trigger a stress response [22]. Guided by this, the interviews aimed to capture those emotional expressions and participants echoed these sentiments of distress, using descriptors like "bother," "worry," "irritation," "tension," "frightening," "painful," "guilty," "frustrating," "hurt," "anxiousness," and "stressed" to express their emotional turmoil.

Most participants had lived in the city for over a decade, making the Chronic Stress Theory particularly relevant. It highlights how prolonged exposure to stress can lead to persistent physiological and psychological response, including depression and anxiety. These theoretical perspectives helped shape our interviews and interpretation of how day-to-day urban pressures can gradually erode mental well-being [23].

Methods

The present qualitative study was conducted during October 2023 to March 2024 in the megacity, Bangalore, renowned as the IT hub and often referred to as the Silicon Valley of India. Specifically, the study was undertaken in south zone of Bangalore within those same 10 Primary Health Center (PHC) areas where the Bangalore Urban Mental Health Initiative (BUMHI) project is

being implemented by the Department of Epidemiology, NIMHANS. The BUMHI project aims at strengthening urban primary health system's response to promote mental health with a strong community engagement component. In this context, there was need to understand the factors that contribute to stress among adults residing in the study area.

The study participants were adults residing in selected non-slum areas across 10 PHCs in south zone of Bangalore. Individuals aged 30–60 years and who were permanent residents of the study area were selected for in-depth interviews (IDIs). This study specifically focused on adults in the age group of 30–60 years, based on the observation from NMHS that prevalence of any mental morbidity was higher in this age group. Based on data saturation a total of 24 participants were purposively selected using a sampling grid based on key demographic variables such as age and gender. Efforts were undertaken to ensure representation across all PHC areas and diverse occupational groups. Participants were recruited with the assistance of local healthcare workers, known community contacts, resident welfare associations and apartment managers. For those willing to participate in the study, written informed consent was obtained for their voluntary participation and audio recording. Confidentiality and anonymity were maintained throughout the study. The ethical clearance was obtained from the Institutional Ethics Committee at NIMHANS, Bengaluru vide letter NO.NIMH/DO/IEC (BS & NS DIV)/2023, dated 14/12/2023.

The IDIs were conducted using a semi-structured interview guide developed after reviewing literature on urban stressors. The interview guide was piloted prior to the start of data collection process. It covered themes related to various physical and social aspects of the urban environment. A detailed version of these themes, along with prompts, can be found in Additional File 1.Initially the open ended questions aimed at asking participants to enlist and describe various stressors in their day to day living broadly under domains of physical and social urban stressors. However, participants faced challenges in enlisting various urban stressors due to poor comprehension about the same. Hence following pilot study the question guide was refined such that participants were asked to describe the role of specific urban stressors (identified through literature review) in their life and at the end, one open ended question was asked to name any other factor of urban living that contributed to their stress/distress.

Interviews were conducted in place comfortable to the participants and face-to-face in a language convenient for the participant, including English, Hindi and Tamil. It was conducted in presence of two researchers, one as the interviewer and the other as a note-taker. The interviews began with introductions and ice-breaker questions, followed by tailored questioning based on participant responses to ensure all topics in the guide were covered. During the process of interviewing, any raised queries were addressed promptly by the researcher and emotional breakdowns were dealt appropriately. In case of interruptions (e.g. phone calls), the interview was paused temporarily and resumed again. Additionally, during the interview, if due to various reasons if the participants felt emotionally low or when they cried, interview was stopped. Appropriate measures were undertaken to emotionally support the participants and subsequently if they were agreeable to continue the interview, we proceeded further and completed the interview.Field notes were taken and participant behavior was also documented (emotions, expressions, body language).

Reflexivity

The researchers belonged to the larger socio-cultural background as the study participants. Hence, researchers were able to understand the social and cultural context in the same manner as participants provided information. Researchers also ensured to approach participants and conduct interviews in a non-judgemental manner. All these measures could have helped in mitigating researcher bias to an extent.

Data management and analysis

The audio files of IDI's were labelled, back up files were made and stored in separate locations from the original files in password protected computers with restricted access.Data management and analysis were conducted using Excel. Participant sociodemographic information was entered into a spreadsheet with unique participant IDs assigned (e.g., NSP1, NSP2, etc.). Audio recordings were summarized and organized into predefine themes in the excel spreadsheet. Simultaneously the relevant verbatim were transcribed and translated by the same researcher who collected the data. Thematic analysis was manually performed by reading and re-reading of the transcripts, identifying patterns within predefined themes and coding them to form sub-themes. The socio-demographic information, field notes and participant observations were used to corroborate with the interviewee's information as and when required. Peer debriefing was done to validate data interpretation and consensus between the researchers on subthemes was established, ensuring coherence with research questions. Literature review was conducted to strengthen the triangulation process.

Table 1 Socio- demographic characteristics of the study participants (*N* = 24)

Variables	*n* (%)
Sex	
Male	13(54.2)
Female	11(45.8)
Age (years)	
30–40	12(50)
41–50	10(41.7)
51–60	2(8.3)
Occupation	
Employed	15(62.5)
Self employed/Business	5(20.8)
Homemaker	3(12.5)
Unemployed	1(4.2)
Residing in Bangalore	
less than 10 year	2(8.4)
10–20 year	5(20.8)
More than 20 year	17(70.8)

Results

The study involved in-depth interviews with 24 participants. 13 males and 11 females, with an average age of 41.5 years, were interviewed. Each interview lasted an average of 39 min (ranging from 21 to 61 min). The demographic details are available in Table 1.The key factors affecting health in cities is generally considered within three broad themes: the physical environment, the social environment and access to health and social services [24]. We have included health and social services as part of the urban social environment and thus the findings of the present study are discussed under two broad categories i.e. urban physical and social environment. The identified themes, subthemes and salient features of subthemes are presented in more detail in Supplementary Table 1 Additional file 2 for urban physical environment and Supplementary Table 2 Additional file 2 for social urban environment. [See Additional file 2]

Urban physical environment and mental health

Housing An own house goes beyond providing mere shelter to individuals. It provides a sense of belongingness and confidence. One of the participants expressed the following: *"Own home gives me more confidence than a million worth of stocks".* Having own house provides other tangential benefits along with enhancing resilience towards other urban stressor. One participant said, his long commute to work amidst dense traffic is stressful. However, having own house, enables him to get adjusted with the long commute and thus not feel stressed by the same. Many expressed affording a house in Bengaluru is challenging and stressful. One of the participant said - *"Real estate prices are super-hyped! Especially in Bangalore, to own a piece of land…it is very stressful."* The financial commitments of paying EMI or paying rent in the backdrop of meeting other needs in life and job instability contributes to financial stress and affects mental health of participants. The financial commitments associated with housing, compel participants to work harder (though they don't want to) and this aggravates the stress further. One participant expressed-*"In Bangalore, the biggest chunk of individual's monthly expense goes towards either easy monthly instalment or rent".* Individuals expressed that in the context of rising cost of living in the city, such financial commitments often provokes thoughts of distress.

The real estate price in the study area, particularly in places where metro connectivity is good, is very high. Not being able to afford own house in the current locality, forces individuals to think outskirts of city to buy property or house. However, moving out from their current location where the participants have lived and cherished since their birth and the feeling of not being able to afford own house in their desired place gives a feeling of helplessness, distress, and dissatisfaction. One of the participants expressed- *"Since I was born and brought up here, I prefer south Bangalore and my relatives too live here. The other side of Bangalore is completely new to me/us, and thought of moving out from here definitely bothers me".* Participants residing in rented houses have their unique set of issues/concerns. Uncertainty of housing tenure, landlords giving arbitrary reasons to vacate the house, demanding higher rent, water issues, insufficient parking space, and restrictions imposed by landlords are all cause for concerns. The search for new houses is also not without stress as it involves inquiries about dietary preferences, religious background, family size, and nature of occupation.

Traffic and transport Navigating through congested roads, dealing with traffic jams, and the overall unpredictability of travel time due to traffic are all stressful. These were identified as most stressful urban factor by majority of the participants interviewed. They used words such as *"irritated,"* "*painful,*" "*stressful,*" "*worry,*" "*anxious,*" "*risky,*" and "*frustrating*" to describe their experiences with traffic and transport issues.Dissatisfaction with public transport was common among all participants due to inadequate bus facilities, lack of feeder services, unpredictable timings, and a lack of seamless travel experiences. Often the location of house and choice of schools for children is determined by availability of public transport facilities and traffic related issues. Social interactions and recreational activities are affected a lot by the traffic issues and they result in feeling of annoyance. A female traveler commuting long hours to the workplace narrated, *"I definitely plan my timings based on traffic hours! And on days I can't it's very painful! (tensed) as it takes longer and harder, I waste lot of time driving, right?"*Another working woman

narrated her agony as follows, *"…it's just a 10 kilometre thing and it took me three hour, and I have never seen my bladder burst so badly ever. So you know those kinds of issues and especially for a woman it's very, very difficult when you're driving yourself. So I have to plan practically everything of mine, if I have to travel during peak hours. So I'll probably not drink water for one hour before, if I have to travel in the car. And that I'm sure is adding more stress to my body".*

Neighborhood Neighborhood aesthetics, accessibility to services, social connectedness within the neighborhood, traffic, pollution, adequate supply of water and electricity contributes to overall satisfaction with the living situation among the participants. One participant highlighted concerns about the commercialization of residential areas, resulting in crowding, congestion, traffic, noise, and discomfort, ultimately affecting his mental peace. This compelled him to move out of his own house to rented accommodation in a better locality for his family's well-being. However, few participants expressed that they didn't have options other than to adjust to the chaotic and resource less locality because either the workplace or children's school was nearby. On the other hand, few participants reported that they faced mockery and disrespect from relatives, friends, or family members for living in a disadvantaged neighborhood.

Walkability Heavy traffic, absence of sidewalks, encroachment of sidewalks by hawkers, vendors, or parked vehicles compels individuals to walk on the roads. This causes fear, stress, and anxiety among pedestrian road users particularly the elderly, children, and their family members. A participant expresses his fear as follows*"Definitely it's a problem for elderly people. Because of this they only go to nearby places. If they are going far then somebody has to accompany them. When they go alone I am worried about the traffic, especially two-wheelers as they don't care how pedestrians are going. They hit and go, and such incidents have happened in my house itself!"*

Safety and security Most participants emphasized feeling safe in their neighborhoods, and thus reducing their fear and anxiety about moving around at any time. However, few seemed to have concerns regarding incidents of crime like thefts, chain snatchings, vehicle thefts, kidnappings, and extortions in the city. These events raised apprehensions about safety especially for parents having children, causing worries to them. One of parents said, *"I am worried, right now if my daughter is going to ground floor also, I will be worried. I'll tell her several times don't go outside the gate. Now time has changed, there are kidnaps, extortions and (Scared, worried expression) so much is happening we have to take care of kids".* Interestingly stray dogs were identified as a source of anxiety among the parents, which discourages them from letting their children play outside. This is illustrated by the following quote by a parent, *"Street dogs are a major concern for us. They have attacked kids and elderly. Definitely I am worried because of that and we tell kids to be very careful".* Participants reported the presence of stray dogs also disrupts the movement of individuals in the neighborhood, especially during nighttime, making them afraid and thoughtful about which road to travel and the selection of mode of travel (two-wheeler or four-wheeler).

Recreational facilities Though participants appreciated the various options available for recreation/relaxation in the city, they also expressed that the added expenditure (of visiting recreational facilities) often turns these stress busters into stressors, leaving some of them with a feeling of *"guilty".* While access to public parks are free, their location, overcrowding and lack of facilities within the park, vehicular traffic along the park access roads and individuals time constraints limits the utilization of the parks. One participant said, *"Parks are there, but it's around 2km from my house and going to that park with this traffic, I feel it's better to stay inside. I cannot cross the road in the evening because of traffic and nothing can be done! (Stressed)."* The fast-paced lifestyle in the city and consequent lack of time made the participants constantly juggle between earning a decent living and finding time for relaxation.

Air, water, and noise pollution Around nine participants expressed concerns about water quality and quantity. This was stressful particularly for tenants, those living in joint families, and those reliant on a single source of water (i.e. having only corporation supply). Consequently, paying for water tankers was adding to financial burden. But more importantly, the conflicts that arise over use of water among tenants and owners caused lot of emotional trauma. A tenant shared instances of frequent quarrels over water, especially when their guests are around, leading to feelings of shame and helplessness as even guests become victims of such instances. Participants who have been living in Bengaluru for many years have raised concerns about the ever-increasing air and noise pollution. The worsening air pollution is particularly worrisome for individuals with pre-existing respiratory issues. Few participants emphasized that noise pollution, especially from traffic, induces *"irritation"* and "*anxiety"* while they are on the roads. They also observed that the conversion of residential areas to commercial ones has resulted in more noise pollution in their locality due to the continuous flow of vehicles leading to sleep-related issues.

Urban social environment and mental health

Cost of living Most of the study participants acknowledged that rising cost of living is a major stressor for them. Cost of purchasing house, house rent, children's education, healthcare services, buying groceries, fuel, gas cylinders, and electricity were all associated with cost of living. Participants said that living in cities though comes with an abundance of amenities, facilities, and job opportunities there is always an inevitable hidden cost that one needs to bear. These rising expenses reduce their savings, impacting their future financial security and often source of stress, especially for those with additional commitments such as loan repayments, migration, fluctuating incomes for the self-employed and job uncertainty for employed workers.

Education Participants, often parents, expressed that their desire to secure the best education for their children often translates into a significant financial burden, intensifying their stress. Poor quality of education in government schools forces them to seek private schools. Identifying private schools providing quality education, affordable and which is conveniently located is laced with many challenges. All the participants flagged the ever-rising education fees, with few even stating that a significant portion of their salary goes towards it. One participant emphasized that "*Main financial stress in Bangalore is about children school fees.*" Many expressed feelings of obligation and frustration due to the necessity of paying high fees for their children's education in private schools. Employed participants noted that the yearly increase in education fees does not align proportionally with their salary hikes, while those in business cited unstable income. This is worrisome for them as highlighted by the following verbatim by one of the participant -"*Every year if there is increment of 10% in the school fees obviously it will be a burden, because nowadays in all companies the increment will be somewhere around 6–8%. It's a burden all the time we think about it (Sad)*".

Healthcare The poor quality of facilities and services in public health system drives people to access private healthcare, thereby increasing the out-of-pocket expenditure on healthcare. Many participants in the interview acknowledged the exponential rise in healthcare costs which concerns them financially. One of the participants expressed *"My Company gives me Rs10 lakh health coverage for whole family per year. Before COVID, I felt it gives good financial coverage. But now (after COVID), health care cost have become exorbitant and I feel that is a very small amount. That's a drastic change and too much! (Tensed)."* Another participant shared that the ever-increasing cost of living, coupled with the additional expense of treating his aged mother for diabetes and renal complications was causing him severe financial stress. Not being able to manage his mother's health expense in the city, he sent her back to the village. He feels helpless and guilty for the same.

Employment Participants expressed that job opportunities are good in the city. However, the demanding nature of their work and the consequent work-life imbalance, job insecurity and income instability significantly influences their mental health. Participants said demanding work schedules often result in tiredness, disrupt sleep patterns and profoundly impact their work-life balance. This also affects their personal and social life eventually affecting their mental health. One of the participant working in automobile industry expressed, *"Very tough (work-life balance)! 6 days a week. Traveling itself takes 3 hours up and down and 10 hours in office, so 13 hours in a day will go. So spending time with family, I find it difficult! (Upset)."* The issue of work-life imbalance is particularly more pronounced among female employees who are managing household responsibilities and work commitments, contributing to elevated stress levels. A female employee, working for a U.S. company said the following, *"Working for US companies is tough. In the sense I have late night calls, it has definitely affected my sleep (stressed). I am sure it will affect my health in long run. I would say work-life balance is not ideal for sure, someday you prioritize family, and someday you prioritize work. Especially being women it's not the same like my husband".*

Income instability and insufficient earnings also contributes to stress among individuals.Participants who are self-employed (especially running small businesses) often bear the brunt of income instability and situations like the pandemic have severely affected their earnings. They mentioned significant portion of their earnings goes towards meeting essential expenses like groceries, gas cylinders, water bills, electricity bills, etc. describing it as *"frightening"* and the even primary source of stress. On the contrary, those employed expressed uncertainty surrounding job stability as significant source of stress and anxiety of potential layoffs linger in the back of the minds of many employees, it becomes even more stressful for individuals planning to take on additional commitments like buying a house. One participant working in an IT industry expressed,*"Definitely yes! Loan repayment is stressful because job stability is uncertain in my industry. I have job today but I don't know about tomorrow, so that would add an additional stress (Tensed). Because it's (repaying loans) a 20/30 years of commitment, we all go through that stress!"*

Neighbourly bonds Having a good social support from family, friends and neighbors is actually stress relieving factor and most participants in the study said they have such support. One participant expressed concern over

poor financial support available to him. His sentiment is captured in the following statement, *"Yes it does bother me! Again this housing thing (buying house). I will be running short of some amount and I don't see anyone who can help me financially (Upset)".* Participants also expressed concern regarding seeking and nurturing social connections because of excessive work pressure. One participant trying his best to nurture relations in his hectic work life stated with huge disappointment that "*everybody is busy making money, they want money, and nobody wants a relationship!"*

Governance and its influence on peoples mental health span across all aspects of city living. However, study participants highlighted poor public grievance redressal system and poor public services and facilities (like in transport, education and health sector) often cause frustrations and in many occasions they are underlying stressors.

Discussion

The present qualitative study comprehensively and systematically explores urban stressors. Various physical and social aspects of urban environment either individually or in combination influences the mental health of study participants. Participants acknowledged that while cities and urban living offer numerous opportunities and amenities they also bring along added stress in various forms. Five urban environmental factors resonated across all the study participants as negatively influencing their mental health: they include issues related to housing, traffic & transportation, neighborhood characteristics, cost of living and employment. Water quality and quantity, air and noise pollution, solid waste management, concerns of safety, social cohesions, and availability, accessibility and affordability of facilities for recreation contributed to varying severity of distress among different subsets of study participants.

Housing is a basic need and rightly it emerged as a major theme contributing to distress among the study participants. Three interrelated aspects of housing namely; affordability for owing house, desire to reside in a particular locality and issues around rental housing emerged as sub-themes impacting individuals' mental health. Bangalore being a megacity and a silicon valley of India, has seen unprecedented rise in real estate prices in past few decades. This is further worsened by the demand supply imbalance in housing units. Therefore, for most of the study participants who are either salaried or having small business, affording house is either beyond their reach or major part of their earning goes into paying/saving for house. The rising real estate market al.so result in high rentals being demanded by the property owners. Paying such high rent, financially strains the participants. Paying significant proportion of monthly income towards easy monthly installments (for house buyers) or rent and in the context of other competing needs in life contribute to financial stress and emotional distress. Previous studies have found a correlation between housing affordability issues and poor mental health [25, 26]. Housing payment difficulties are shown to have psychological repercussions beyond general financial challenges, with effects comparable to those of marital separation and unemployment [27].

Neighborhoods in Bangalore are not uniformly developed and localities which are well developed and have all amenities, facilities and services also have high real estate prices. Participants in the current study were interviewed from few such localities. Among the participants who managed to purchase homes in such well-developed locality expressed feeling of satisfaction and those who couldn't afford felt dissatisfied and helpless. Eventually such individuals move out to seek houses in otherwise less developed neighborhood and this systematically creates inequality in the society having negative impact on mental health [28]. For participants residing in rented house, apart from paying rent several other issues (like uncertainty of tenure, the search for new residence, restrictions imposed by landlords, issues with car parking and feelings of lack of attachment and connection with the place) contributes to stress. This was echoed in a study where higher incidence of depressive symptoms was observed among renters, even after controlling for various factors such as housing affordability, age, gender, marital status, educational attainment, income, and baseline depressive symptoms. Psychological comfort and ontological security associated with homeownership was thought as possible explanation for that [29].

Traffic congestion can increase stress, anger, and frustration, and negatively impact mental health and well-being of individuals [30–32]. Studies have found that in individuals with commute time of 60 min or more were 1.16 times more likely to experience depressive symptoms than those with commute time under 30 min [33]. Bengaluru is the sixth most congested city globally in 2023 and an average Bengaluru commuter spends a total of 257 h on road during peak hour of which 132 h could be attributed to congestion [34]. Consequently, traffic congestion and transportation challenges emerged as major urban stressor in the current study and participants noted that frequent traffic jams and longer travel times caused significant stress and frustration. Long commute hours and traffic congestion can drain the individuals, physically and mentally [33]. This aligns with existing research linking traffic exposure to stress hormone release and emotional strain [35]. A qualitative study in London by Anciaes et al., similarly highlighted several impacts of traffic on day-to-day life including air and noise pollution, travel time losses, sleep disturbance

and safety concerns [36]. Additionally, in the present study participants reported that traffic congestion and transport related issues influences their choices for work, education and house. They also negatively impact the work-life balance in general and particularly for working women. Such spiraling influence on others aspects of life affects the overall mental health and well-being of the participants.

Evidence indicates that there is an association between the built environment, health and well-being, and levels of physical activity. Perceptions of neighborhood are strongly associated with health and well-being [37]. In our study factors such as neighborhood aesthetics, accessibility to services, social connectedness, and broader environmental elements like traffic, transportation, pollution, and water and power facilities collectively contributed to the sense of satisfaction. Participants having their residence in such neighborhood expressed satisfaction and those who couldn't afford felt dissatisfied as explained previously. Unplanned commercialization of residential areas, neighborhoods less conducive for walking particularly for elderly, safety and security concerns specifically for parents (more specifically for those having girl children) and inadequate parks in the neighbourhood were all associated with discomfort, sleep disturbance, fear and stress. Such features in the neighborhood are also associated with poor mental health and mental disorders [38–42].

Three out of five Britons reported that the cost-of-living crisis is negatively impacting their mental health, to the extent that as many as a quarter (23%) say they're having problems sleeping because of worries about rising costs [43]. The cost of living in Bangalore is very high according to cost of living index in India, 2023 and they emerged as significant concern among the study participants. Participants associated the cost of living with the increasing expenses related to real estate, house rent, children's education, healthcare services, and basic amenities such as groceries, fuel, gas cylinders, and electricity. The escalation of prices not only led to immediate financial stress, but also reduced saving, resulted in stress of taking and paying for debt and a vicious trapping cycle thereof considerably increased the worries of the participants. Similarly, a qualitative study in China found rural-urban migrants experienced stress arising due to financial hardship and a lack of sense of belonging in urban environments. Issues such as low wages, high living expenses, the burden of supporting both parents and children financially, and expensive rent were commonly reported [44]. Chronic financial stress associated with daily hassles is known to have greater impact on physical and psychological health than major life events [45]. Such day-to-day stressors are also associated with a more negative mood [46].

Work-related issues were a significant source of stress for participants, particularly due to the demanding nature of jobs and the resulting work-life imbalance, an issue especially pronounced among working women. Demanding work can lead to job/work stress which in turn can result in poor mental health [47]. A qualitative study in London across public and private sectors identified key stressors including working conditions, nature of the job, management practices, life events and financial factors [48]. These findings align with most of the aspects of the current study, highlighting the universal nature of work stressors.

However, work life imbalance arising out of work demands can interfere with the quality time spent by individuals for himself (engaging in physical activity, pursuing hobbies etc.), with his family members and friends. Similarly, a qualitative study conducted in Midwestern city found that occupational stress among urban teachers negatively impacted their personal relationships and physical health [49]. These aspects of personal and social life are actually rejuvenating, refreshing and support good mental health. Lack of such thing often contributes to unhealthy stress and such prolonged stress has profound effect on physical and mental wellbeing of individuals. Financial instability, temporal uncertainty, marginal status and employment insecurity have a wide range of detrimental effects on people's economic wellbeing, social relationships, work-related behaviorsand physical health. In turn, these multiple areas of conflict and strain led to negative mental health effects. This was echoed in the present study too [50].

In conclusion, this study highlights how both physical and social aspects of urban life significantly influence mental well-being, a finding consistent with global research, including a qualitative study from Tokyo that identified similar stressors like transportation issues, overcrowding, financial strain, and reduced social interaction [51]. As urban populations continue to rise, there is an urgent need to prioritize mental health within urban planning and policymaking through integrated and multisectoral approaches.

Strengths and limitations

To the best of our knowledge present study is a unique attempt to understand the influence of urban environment on mental health. The strength of the study is its comprehensive understanding of the role of various aspects of physical and social environment on mental health of the city population.

However the study has certain limitations. Firstly as this is a qualitative study conducted in a single Indian megacity, the findings are context-specific and may not be generalizable to other cities with different urban layouts, policies, and socio-economic structures. Secondly,

it was conducted among adults in the age group of 30–60 years and hence the factors identified in this study may not reflect urban stressors among children, adolescents/young adults and elderly. Due to resource constraints instead of usual process, transcription and translation was executed simultaneously by the single researcher. This could have introduced researcher bias. However, to minimize this bias, peer debriefing was done to validate data interpretation and consensus on sub-theme identification was obtained from all the authors after they independently reviewed the data. We also acknowledge that participant validation of translated transcripts was not feasible in this study. Finally, the study did not incorporate standardized mental health assessment tools. Including such quantitative measures could have strengthened the connection between urban stressors and specific mental health outcomes.

Conclusion

The increasing urbanization and higher prevalence of mental health issues in cities underscore the importance of developing cities that not just provide opportunities to its residents to survive but to thrive. This highlights the importance of SDG 11, Health in All Policies approach, WHOs Healthy Cities approach and Smart cities mission of Indian government. A comprehensive understanding of urban stressors particularly in the Indian context is vital for supporting such initiatives. Our study provides empirical evidence, through qualitative exploration, on how urban environment influences the mental health of the residents in a megacity in India. However further quantitative studies are recommended to build the evidence to this end. In the context of growing emphasis on urbanization and urban planning in India, findings from our study and the future studies could potentially and positively impact the urban policies and practices (particularly in urban design and planning, transport planning, urban governance, housing, health services, urban employment, recreation facilities etc.) resulting in creating an enabling urban environment that could support mental health of the expanding urban population.

Abbreviations

BUMHI	Bangalore Urban Mental Health Initiative
IDIs	In-Depth Interviews
NMHS	National Mental Health Survey
PHC	Primary Health Center
SDG	Sustainable Development Goals

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12889-025-22817-x.

Supplementary Material 1

Supplementary Material 2

Acknowledgements

The research team would like to acknowledge all the healthcare workers, community members, staff of BUMHI project, Faculty and staff in Department of Epidemiology, NIMHANS for facilitating the conduct of study. Our special thanks to all the participants of the study for provide valuable insights on the subject under investigation.

Author contributions

P.P. involved in conceptualization of the study, designing the protocol, collection of data, data analysis and manuscript writing. A.B. involved in conceptualization, designing the protocol, supervised conduct of the study, reviewed the data and conducted analysis and manuscript editing. S.R. involved in conceptualization, designing the protocol, support in analysis and reviewing manuscript. M.J. involved in data collection, support in analysis and manuscript review. V.S. involved in manuscript writing and editing. The authors read and approved the final manuscript.

Funding

This article is based on student thesis work, and the research did not receive any external funding.

Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The ethical clearance for the study was obtained from the Institutional Ethics Committee at NIMHANS, Bengaluru vide letter NO.NIMH/DO/IEC (BS & NS DIV)/2023, dated 14/12/2023. A written informed consent was obtained from all the participants for their voluntary participation and audio recording.

Consent for publication

A written informed consent was obtained from all the participants for publication.

Competing interests

The authors declare no competing interests.

Received: 28 September 2024 / Accepted: 15 April 2025
Published online: 30 April 2025

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