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Article

Beyond Infection Control: Multidimensional Unmet Needs and Health System Gaps During the COVID-19 Pandemic in India

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Abstract

The COVID-19 pandemic exposed significant vulnerabilities in health systems, extending beyond infection-related outcomes to multidimensional social, economic, psychological, and healthcare disruptions. This mixed-methods study aimed to assess multidimensional unmet needs and public health system gaps during the COVID-19 pandemic in India. A web-based cross-sectional survey was conducted among 958 community-dwelling adults using a structured questionnaire covering eight domains of unmet needs. Quantitative data were analyzed using descriptive statistics and multiple-response analysis, while qualitative data from open-ended responses (n = 20) were analyzed thematically. Integration was performed during interpretation. Financial instability was widely reported, with 79.1% experiencing income loss and 71.8% reporting difficulty managing expenses. Nutritional insecurity affected 63.4% of participants, with marked dietary changes and weight fluctuations. Social disruption included inability to meet friends (42%) and stigma (35.1%). Psychological distress was substantial, with 40% reporting stress and anxiety and only 15% accessing counseling services. Child-related educational disruption was prominent, including learning difficulties (46.1%) and academic disruption (44.8%). Preventive health gaps were evident, with 45.7% reporting need for COVID-19 awareness and 41–42% reporting insufficient information on treatment and complications. Healthcare access was disrupted, including missed follow-ups (32.4%) and delayed care. Qualitative findings reinforced quantitative results, highlighting compromised childcare, economic hardship, healthcare delays, psychological distress, and informational gaps. Integrated analysis demonstrated convergence across childcare and education, mental health, financial instability, healthcare access, and preventive awareness as key unmet needs. The study concludes that COVID-19 generated interconnected multidimensional unmet needs, highlighting the need for integrated, equity-focused health system strengthening. Findings emphasize the importance

of community-based nursing, improved risk communication, continuity of care, and multisectoral coordination in future public health emergencies.

Keywords: COVID-19; pandemics; public health; needs assessment; health services accessibility; health equity; mental health; child care; nutrition; preventive health services; mixed methods research; India

1. Introduction and Background

The COVID-19 pandemic exposed critical vulnerabilities within health systems worldwide, extending beyond biomedical consequences to generate widespread social, economic, and psychosocial disruptions. Its high transmissibility led the World Health Organization to declare COVID-19 a pandemic due to substantial morbidity and mortality [1]. In response, governments implemented large-scale containment measures including isolation, social distancing, travel restrictions, quarantine, suspension of mass gatherings, and closure of educational institutions and workplaces. While essential for infection control, these interventions significantly disrupted essential services and daily functioning, revealing systemic gaps in public health preparedness, service continuity, and emergency response coordination [2,3].

In India, the first confirmed case was reported in Kerala on 30 January 2020 and subsequently in Tamil Nadu on 7 March 2020 [4]. By the end of 2020, more than 11 million cases and 148,000 deaths were recorded, placing India among the most affected countries globally [5]. Mitigation strategies included nationwide lockdowns, rapid healthcare expansion, and public health campaigns promoting hygiene, masking, and physical distancing [6,7]. Despite these measures, cumulative infections exceeded 34 million by December 2021, with nearly 478,000 deaths and a peak of 414,433 daily cases during the second wave [8].

Beyond epidemiological outcomes, the pandemic exposed profound public health system gaps, including disruption of routine healthcare services, preventive programs, and chronic disease management. The rapid reallocation of resources to COVID-19 care revealed limitations in surge capacity, continuity-of-care frameworks, and integration of emergency preparedness within primary and community health systems [2,3]. These disruptions highlight the need for resilient, community-oriented service delivery models, where community and public health nurses play a central role in maintaining essential care during crises.

The pandemic further intensified economic instability and revealed weaknesses in social protection systems. Marginalized populations, informal workers, and socioeconomically disadvantaged groups experienced disproportionate vulnerability, underscoring the interdependence of health, economic security, and social well-being [9,10]. Similarly, widespread mental health stress, fear, and isolation occurred alongside limited access to structured psychosocial support, revealing persistent gaps in mental health integration within emergency preparedness systems [11,12]. Community health nurses are strategically positioned to address these gaps through early identification, counseling support, and community-level interventions.

Disruptions in education, childcare, and information systems further exposed structural inequities. School closures, digital barriers, and limited home-based learning support disproportionately affected children and caregivers, reflecting the interconnected nature of social and health systems [13,14]. Unequal access to digital and telehealth services further widened disparities, reinforcing the need for inclusive, community-based public health interventions.

Frontline health professionals were central to surveillance, vaccination, and continuity of care, highlighting the importance of workforce capacity and coordinated response systems [15,16]. Within this context, community and public health nurses function as key links between health systems and communities through health education, risk communication, and service delivery. However, the pandemic also demonstrated that health emergencies are not only biomedical crises but systemic stress tests that expose fragmented, inequitable, and poorly integrated health and social systems.

Despite growing literature on COVID-19, most studies have examined isolated domains such as mental health, economic burden, or healthcare disruption independently [11,12]. In India, evidence remains fragmented, with limited studies capturing the interconnected and co-occurring nature of unmet needs across multiple life domains [15,16]. Importantly, integrated, mixed-methods evidence on how these multidimensional vulnerabilities coexist within the same population remains scarce, particularly from a community and public health systems perspective. This represents a critical gap for designing comprehensive, equity-oriented pandemic preparedness strategies.

To address this gap, the present mixed-methods study provides an integrated assessment of multidimensional unmet needs during the COVID-19 pandemic in India. Unlike prior single-domain approaches, this study systematically examines the interrelated nature of economic, social, psychological, preventive, childcare, and healthcare access needs within one analytical framework, supported by qualitative insights. This integrated approach generates systems-level evidence to inform resilient, coordinated, and equity-focused public health and community nursing responses.

The significance of this study lies in its contribution of multidomain, population-level evidence that moves beyond isolated outcome analysis to reveal the interconnected structure of pandemic-related vulnerabilities. It identifies priority areas for intervention, strengthens understanding of health system resilience, and informs community-centered nursing and policy strategies in India and comparable low- and middle-income settings.

2. Materials and Methods

2.1. Research Design

A mixed-methods approach was employed to investigate public health system gaps and multidimensional unmet needs experienced during the COVID-19 pandemic in India. The study integrated a quantitative web-based cross-sectional survey with qualitative analysis of open-ended responses, enabling simultaneous examination of measurable trends and contextual lived experiences. This design facilitated a broader understanding of the pandemic's multifaceted impact and its relevance to community and public health nursing practice. Reporting standards were guided by the **STROBE statement** for the quantitative component and **COREQ recommendations** for the qualitative component to ensure methodological rigor and transparency.

2.2. Population and Sampling

The study targeted community-dwelling individuals residing in India during the COVID-19 pandemic who had internet access and were able to complete an online survey. Although the initial outreach intended to include a broad age range, the final analytical sample comprised adults aged 18 years and above.

Sample size was estimated using the standard formula for population proportions. In the absence of prior prevalence estimates for unmet needs, a conservative proportion of 50% was assumed. At a 95% confidence level and 5% precision, the minimum required sample was 384. After adjusting for a projected 20% non-response rate associated with online surveys, the final minimum target was 480 participants.

Given pandemic-related restrictions, probability sampling was not feasible. Therefore, convenience snowball sampling was adopted to facilitate rapid and wide community-level recruitment across diverse demographic groups. Participants were enrolled through online platforms, with eligibility criteria including age ≥ 18 years, internet accessibility, and informed consent. A total of 958 complete responses were obtained, exceeding the calculated requirement and thereby enhancing the precision of descriptive estimates.

For the qualitative strand, 20 information-rich responses were purposively selected from the open-ended survey items. Selection was based on completeness, depth, and relevance to the research objectives. This sample size was deemed adequate once thematic saturation was reached, indicated by the absence of new substantive codes across successive responses.

2.3. Data Collection Instrument

Data were collected using a structured questionnaire developed through focus group discussions involving families affected and unaffected by COVID-19. The instrument comprised two sections.

The first section captured socio-demographic and background information, including age, gender, educational attainment, marital status, occupation, household income, residence, COVID-19 exposure, vaccination status, and comorbidities.

The second section, titled **Community Needs Assessment**, examined eight domains of unmet needs: economic, nutritional, social, spiritual, mental health, preventive, childcare, and healthcare. This section included 40 dichotomous (yes/no) items and three open-ended questions to capture additional contextual challenges.

Content validity was established through expert review by six specialists, yielding a Content Validity Index (CVI) of 0.98. Internal consistency reliability of the 40-item dichotomous scale was assessed using the Kuder–Richardson Formula 20 (KR-20), resulting in an overall coefficient of 0.952, indicating excellent consistency. Domain-specific coefficients varied from 0.063 to 0.955, with the highest reliability observed in preventive, childcare, and mental health domains. Lower values in selected domains were interpreted as reflective of the exploratory and multidimensional nature of pandemic-related needs rather than deficiencies in instrument performance.

2.4. Pilot Testing

A pilot study was undertaken to evaluate feasibility, clarity, and administrative procedures associated with the questionnaire. Feedback obtained during this phase informed minor revisions prior to large-scale implementation.

2.5. Ethical Considerations

Ethical approval was obtained from the Institutional Review Board and Ethical Review Board of Narayana Health (Approval No. NHH/AEC-2021-602). Participants provided implied informed consent electronically before accessing the survey. Confidentiality, anonymity, and voluntary participation were maintained throughout the study.

2.6. Data Collection Procedure

Data collection was conducted between December 2021 and January 2022 using a Google Forms–based questionnaire. The survey link was disseminated through WhatsApp and other online social networks. The introductory page included study details, consent information, and participant rights.

To preserve data quality, respondents were restricted to a single submission. Participants were also encouraged to share the survey within their personal and professional networks, thereby extending community reach. Qualitative responses were recorded directly through the same platform, ensuring consistency in data capture.

2.7. Data Analysis

Quantitative data were analyzed using SPSS version 23. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize participant characteristics and unmet needs across the eight assessment domains. The hierarchy of needs was generated using a multiple-response analysis based on the proportion of affirmative responses for each item. Each need item was treated independently, and percentages reflect the proportion of participants endorsing that specific need. Therefore, the ranking represents relative frequency of reported needs and not mutually exclusive categories.

Qualitative data were analyzed using an inductive thematic approach aligned with COREQ principles. Responses were read repeatedly for familiarization, coded line-by-line into meaningful units, and subsequently grouped into categories. These categories were synthesized into broader

themes representing participants' experiences during the pandemic. Themes were iteratively refined for conceptual clarity, and representative quotations were selected to support interpretation.

To strengthen analytical rigor, two researchers independently reviewed codes and themes. No qualitative software was employed. Integration of quantitative and qualitative findings occurred during interpretation, allowing for a comprehensive understanding of multidimensional unmet needs.

2.8. Trustworthiness

Trustworthiness of the qualitative analysis was established using Lincoln and Guba's framework. Credibility was supported through in-depth engagement with information-rich responses and the inclusion of verbatim quotations. Dependability was maintained through systematic coding procedures and an audit trail. Confirmability was ensured by grounding interpretations in participant narratives, while transferability was facilitated through detailed contextual description of the study population and setting.

3. Results

3.1. Socio-Demographic Characteristics

A total of 958 individuals participated in the online survey. As shown in Table 1, the majority were female (64%), with a mean age of 31.8 years (SD = 11.6). More than half were married (54.3%), and 42.5% were single. Regarding education, 43% were graduates and 28.9% had postgraduate or higher qualifications. Students formed the largest occupational group (27.5%), followed by teachers (14.6%) and healthcare professionals (12.7%). Over half of participants (56.7%) reported a monthly income below ₹25,000. Participants were distributed across rural (45.4%) and urban (42.6%) settings, with the majority from South India (91.6%).

Table 1. Frequency and percentage distribution of demographic variables n=958.

S. No.	Demographic variables	Frequency (f)	Percentage (%)
Gender			
1	Male	351	36.6
	Female	607	63.4
Age (years)			
2	Mean and S.D	31.8 ±11.6	
Educational status			
3	Below 8th standard	44	4.6
	8-12th standard	138	14.4
	Diploma	87	9.1
	Graduation	412	43
	Post-graduation and above	277	28.9
Marital status			
4	Single	407	42.5
	Married	520	54.3
	Separated / Divorced	6	0.6
	Widow/ widower	25	2.6
Occupation /Profession			
5	Teaching	140	14.6
	Health Care industry	122	12.7
	Engineering	96	10
	Agriculture	34	3.5
	Business / shopkeeper	35	3.7
	Law /Auditors/ Bank /Clerical /Office work	22	2.3
	Student	263	27.5

	Labor	47	4.9
	housewife	112	11.7
	Others	87	9.1
Monthly income (Rupees)			
6	Below 25000	543	56.7
	25001- 50000	226	23.6
	above 50001	189	19.7
Place of residence			
7	Rural	435	45.4
	Urban	408	42.6
	Sub urban	115	12
Divisions- India			
8	South	877	91.6
	Central	44	4.6
	East	31	3.02
	West	4	0.4
	North	2	0.2

3.2. COVID-19–Related Background Characteristics

As shown in Table 2, 52.3% of participants were not working during the pandemic, while 47.5% were employed. COVID-19 infection was reported by 6.4% during the first wave and 7.8% during the second wave. Household infection was reported by 16.1% of participants. At the time of data collection, 53.8% had received COVID-19 vaccination. Comorbidities were reported by 9.4%, with diabetes mellitus (34.4%) and hypertension (25.6%) being the most common.

Table 2. Frequency and percentage distribution of Background Information n=958.

S. No	Background information	Frequency (f)	Percentage (%)
Working status			
1	Yes	455	47.5
	No	501	52.3
Affected by COVID 19 during first wave			
2	Yes	61	6.4
	No	897	93.6
Affected with COVID 19 during second wave			
3	Yes	75	7.8
	No	883	92.2
Family member who stays in same house affected with COVID 19			
4	Yes	154	16.1
	No	804	83.9
How many of them affected with COVID 19 in the family			
5	1	70	45.5
	2	26	16.9
	3	13	8.4
	4 and more but less than 8	45	29.2
Have you vaccinated (as on month /year)			
6	Yes	515	53.8
	No	443	46.2
Any co morbidities / major diseases			
7	Yes	90	9.4
	No	868	90.6
Co-Morbidities			
8	Hypertension	23	25.6
	DM	31	34.4
	Diabetes and hypertension	20	22.2
	Thyroid disorder	9	10

Asthma	2	2.2
Cardiac problems	3	3.3
Neuro problems	1	1.1
SLE	1	1.1

3.3. Multidimensional Needs During the COVID-19 Pandemic

Table 3 presents participant-reported needs across multiple domains using a multiple-response format; therefore, percentages reflect independent endorsement of each item.

Table 3. Frequency and Percentage distribution of various identified needs during COVID 19 pandemic.

Needs	ASPECTS	Yes	No
Economic needs	I receive my regular income with COVID 19.	241(25.2%)	716 (74.8%)
	COVID 19 pandemic hit my job and salary	757(79.1%)	200(20.9%)
	I am able to meet the family expenditure during COVID 19 without struggle	270 (28.2)	687(71.8%)
	I worry about my economy in future	363(37.9%)	594(62.1%)
	I have changed my job due to COVID 19	67(7%)	890(93%)
	I borrowed money during COVID 19	182(19%)	775 (81%)
Nutritional needs	I could get food properly with sickness / COVID 19 pandemic	350(36.6%)	607 (63.4%)
	I have difficulty to purchase the grocery from Public Distribution System / Private shops	245 (25.6%)	712 (74.4%)
	I lost weight during lock down	159 (16.6%)	798(83.4%)
	I could not get varieties of food / my snacks / junk food	301(31.5%)	656 (68.5%)
Social needs	I gained weight during lock down	143 (14.9%)	814(85.1%)
	Neighbors hide when they get affected with COVID 19	217 (22.7%)	74(77.3%)
	My neighbors/friends helped me during COVID 19 Pandemic	299 (31.2%)	658 (68.8%)
	I could not meet my friends or other people during pandemic	402(42%)	555(58%)
	Public avoid/stigmatize the person / family which is affected with COVID infection	336(35.1%)	621(64.9%)
	Social media spreads rumour related to COVID 19	339(35.4%)	618 (64.6%)
Spiritual needs	My religious rituals/functions could not be performed during COVID 19 Pandemic	378 (39.6%)	579(60.4%)
	I wish to go to my religious place (Church, Temple, Mosque etc..) for praying	348 (36.4%)	609(63.6%)
Mental Health Needs	I questioned God when I lost my friend/relative/family member someone with COVID 19	261(27.3%)	696 (72.7%)
	I feel more stressed-out during pandemic	381 (39.8%)	576 (60.2%)
	I am anxious about the present Scenario	384 (40.1%)	573 (59.9%)
	I want to have some relaxation	406 (42.4%)	551(57.6%)
	I am unable to practice some mind relaxing activities	323 (33.8%)	634 (66.2%)
	I need counseling services to release my stress during pandemic	140 (14.6%)	817(85.4%)
Preventive needs	I wish to get my family vaccinated.	437 (45.7%)	520(54.3%)
	I wish to get adequate awareness about the COVID 19 prevention	437 (45.7%)	520(54.3%)
	I wish to know how to prevent complications with COVID 19	403 (42.1%)	554(57.9%)
Child care needs	I wish to know about the care/treatment to be followed with COVID 19 in detail	398(41.6%)	559(58.4%)
	I notice kids develop behavioral changes during COVID 19 with social restrictions	400(41.7%)	557 (58.2%)
	Kids' education/ academics are badly affected with COVID 19 restrictions	429 (44.8%)	528 (55.2%)
	I am not able to spend enough time with my kids because of my work	216 (22.6%)	741(77.4%)
	Kids complain of some physical discomfort during COVID 19 with social restrictions	340(35.5%)	617(64.5%)

	Students/ children face learning difficulties because of Online Education /classes	441 (46.1%)	516 (53.9%)
	Kids spent most of their time with Mobile phones, TV etc	435(44.5%)	522 (54.5%)
	I am willing to go to hospital with mild symptoms of COVID 19	258 (27%)	699 (73%)
	I am unable to get admission with COVID 19 for me/family member in hospital immediately	201 (21%)	756 (79%)
Health care needs	I wish to know about the hospitals treating COVID-19 in my locality	370 (35.7%)	587 (61.3%)
	I struggle for the needed treatment with COVID 19	155 (16.2%)	802 (83.8%)
	I am unable to go to hospital for regular health check-up for me/ family members	310 (32.4%)	647(67.6%)
	I wish to learn more about the home management of COVID-19	385 (40.2%)	572(59.8%)

3.3.1. Financial Needs

Financial disruption was widely reported, with 79.1% experiencing job or salary loss and 71.8% reporting difficulty managing household expenses. Concerns regarding future financial stability were reported by 37.9%, while 19% reported borrowing money and 7% reported job changes.

3.3.2. Food and Nutritional Needs

Only 36.6% reported adequate access to food. Difficulty purchasing groceries was reported by 25.6%, and 31.5% reported lack of access to preferred foods. Weight changes included weight loss (16.6%) and weight gain (14.9%).

3.3.3. Social, Spiritual, and Informational Needs

Inability to meet friends was reported by 42%, perceived stigma by 35.1%, and exposure to misinformation by 35.4%. Difficulty performing religious or social rituals was reported by 39.6%, while 27% reported questioning faith following COVID-related loss.

3.3.4. Mental Health Needs

Stress and anxiety were reported by 40%, while 42% expressed a need for relaxation support. Only 15% reported accessing counseling services.

3.3.5. Preventive and Healthcare Needs

Need for COVID-19 prevention awareness was reported by 45.7%, while 41–42% reported need for information on treatment and complications. Difficulty accessing healthcare services included missed follow-ups (32.4%), admission barriers (21%), and reluctance to visit hospitals for mild symptoms (27%).

3.3.6. Child Health and Education Needs

Child-related disruptions were prominent, including learning difficulties (46.1%), academic disruption (44.8%), increased screen time (44.5%), and behavioral changes (41.7%). Inability to spend sufficient time with children was reported by 22.6%.

3.4. Priority Hierarchy of Needs

Figure 1 illustrates the ranking of participant-reported needs based on the proportion of affirmative responses. Child-related educational disruption, preventive health awareness, and mental health needs emerged as the most frequently reported domains.

Needs	Overall Needs	category of needs	Over all priority	Magnitude of needs	Priority Rank	Priority rank in the categorized needs
Students/ children face learning difficulties because of Online Education /classes	46	Child care needs			1	1
I wish to get my family vaccinated.	46	Preventive needs			2	1
I wish to get adequate awareness about the COVID 19 prevention	46	Preventive needs			3	2
Kids spent most of their time with Mobile phones, TV etc	45	Child care needs			4	2
Kids education/ academics are badly affected with COVID 19 restrictions	45	Child care needs			5	3
I want to have some relaxation	42	Mental health Needs			6	1
I wish to know how to prevent complications with COVID 20	42	Preventive needs			7	3
I could not meet my friends or other people during pandemic	42	Social needs			8	1
I notice kids develop behavioral changes during COVID 19 with social restrictions	42	Child care needs			9	4
I wish to know about the care to be followed with COVID 19 in detail	42	Preventive needs			10	4
I wish to learn more about the home management of COVID-20	40	Health care needs			11	1
I am anxious about the present Scenario	40	Mental health Needs			12	2
I feel more stressed out during pandemic	40	Mental health Needs			13	3
My religious rituals/functions could not be performed during COVID 19 Pandemic	40	Social needs			14	2
I wish to know about the hospitals treating COVID-19 in my locality	39	Health care needs			15	2
I worry about my economy in future	38	Economic needs			16	1
I could get food properly with sickness / COVID 19 pandemic	37	Nutritional needs			17	1
I wish to go to my religious place (Church, Temple, Mosque etc..) for praying	36	Spiritual needs			18	1
Kids complains of some physical discomfort during COVID 19 with social restrictions	36	Child care needs			19	5
Social media spreads rumor related to COVID 20	35	Social needs			20	3
Public avoid/stigmatize the person/ family which is affected with COVID infection	35	Social needs			21	4
I am unable to practice some mind relaxing activities	34	Mental health Needs			22	4
I am unable to go to hospital for regular health check-up for me/ family members	32	Health care needs			23	3
I could not get varieties of food / my snacks / junk food	31	Nutritional needs			24	2
My neighbors/friends helped me during COVID 19 Pandemic	31	Social needs			25	5
I am able to meet the family expenditure during COVID 19 without struggle	28	Economic needs			26	2
I questioned god when I lost my friend/relative/family member some one with COVID 20	27	Spiritual needs			27	2
I am willing to go to hospital with mild symptoms of COVID 19 .	27	Health care needs			28	4
I have difficulty to purchase the grocery from Public Distribution System / Private shops	26	Nutritional needs			29	3
I receive my regular income with COVID 19.	25	Economic needs			30	3
Neighbors hide when they get affected with COVID 20	23	Social needs			31	6
I am not able to spend enough time with my kids because of my work	23	Child care needs			32	6
I am unable to get admission with COVID 19 for me/family member in hospital immediately	21	Health care needs			33	5
COVID 19 pandemic hit my job and salary	21	Economic needs			34	4
I borrowed money during COVID 20	19	Economic needs			35	5
I lost weight during lock down	17	Nutritional needs			36	4
I struggle for the needed treatment with COVID 20	16	Health care needs			37	6
I gained weight during lock down	15	Nutritional needs			38	5
I need counselling services to release my stress during pandemic	15	Mental health Needs			39	5
I have changed my job due to COVID 20	7	Economic needs			40	6

Figure 1. Percentage-based priority hierarchy of identified needs during the COVID-19 pandemic.

The highest-ranked items included difficulties in children's learning (46.1%), need for preventive awareness (45.7%), academic disruption (44.8%), and increased screen time (44.5%). Mental health concerns such as stress (40%) and need for relaxation (42%) were also prominent. Financial and healthcare access-related needs were moderately ranked, while counseling services (15%) and job changes (7%) were least frequently reported.

3.5. Qualitative Findings (Thematic Analysis)

Thematic analysis of open-ended responses generated five major themes reflecting participants' lived experiences during the pandemic.

Theme 1: Compromised Childcare and Educational Support

Participants reported challenges in supervising children during online learning and limited digital access.

"Children were unattended during their online classes because I was working" (P5, Female, Teacher).

Theme 2: Economic Instability and Loss of Livelihood

Job loss and financial insecurity were widely reported.

"I lost my job in a private organization, and they did not give salary" (P2, Male, Private employee).

Theme 3: Disrupted Healthcare Access

Participants reported delayed and interrupted medical care.

“Even my heart surgery was delayed because of COVID” (P11, Male, Retired).

Theme 4: Psychological Distress and Work–Life Imbalance

Fear, stress, and emotional burden were frequently reported.

“Fear of death was always there, and we lost a close family member” (P7, Female, Homemaker).

Theme 5: Unmet Preventive and Informational Needs

Participants reported confusion due to changing public health guidelines.

“Information kept changing, and it was difficult to understand what to follow” (P15, Male, Self-employed).

3.6. Integrated Mixed-Methods Summary (Quantitative–Qualitative Convergence)

Integration of quantitative and qualitative findings demonstrated convergence across key domains. Quantitative data identified childcare and educational disruption, mental health stressors, and preventive health needs as the most frequently reported issues. These findings were strongly supported by qualitative themes, particularly Compromised Childcare and Educational Support and Psychological Distress and Work–Life Imbalance.

Similarly, financial instability and healthcare access limitations identified in quantitative analysis were reinforced by qualitative narratives describing job loss, delayed treatment, and difficulty accessing healthcare services. Informational gaps and uncertainty regarding COVID-19 prevention were consistently reflected across both datasets.

Overall, both quantitative and qualitative findings converged to highlight childcare and education, mental health, financial instability, healthcare access, and informational clarity as central multidimensional needs during the COVID-19 pandemic.

4. Discussion

This study demonstrates substantial multidimensional unmet needs during the COVID-19 pandemic across economic, nutritional, social, psychological, preventive, childcare, and healthcare domains. The findings highlight interconnected disruptions affecting individuals in India and reinforce that pandemic responses must extend beyond infection control to address broader social determinants of health. Economic instability was a major concern, with participants reporting job loss, delayed income, and difficulty meeting daily needs. Financial insecurity was associated with increased stress and sleep disturbances ($p < 0.001$) [17,18], consistent with evidence linking economic downturns to psychological distress [19], underscoring the need for early identification of socioeconomic vulnerability and strengthened social protection systems during crises.

Economic hardship was closely linked with nutritional insecurity, as reduced income and supply disruptions limited access to adequate food. More than half of participants reported nutrition-related difficulties, including dietary changes and weight fluctuations [23,24], consistent with prior evidence of increased food insecurity during the pandemic [20,21]. Social disruption was also evident, with participants reporting inability to meet friends (42%) and stigma (35%) [26–28], alongside limited social support (31%), reflecting weakened community cohesion and increased psychological vulnerability [29–31]. Misinformation further increased uncertainty [32,33], while spiritual practices emerged as a coping mechanism supporting resilience [34–36].

Psychological burden was substantial, including stress, anxiety, and emotional exhaustion [38–41], yet mental health service utilization remained low [42], reflecting barriers such as stigma and limited access. This highlights the importance of integrating community-based and tele-mental health services into emergency preparedness systems [43,44]. Childcare and educational disruptions were prominent, particularly among working parents, with difficulties in supervising children, limited digital access, and learning interruptions affecting academic engagement [45–47]. These

disruptions increased caregiver burden and highlight the need for digital equity and continuity of education during emergencies [48].

Preventive health communication gaps contributed to confusion and vaccine hesitancy [49,50], although awareness improved over time [51,52], emphasizing the importance of consistent and transparent public health messaging [53]. Healthcare service disruptions, including delayed consultations and interrupted treatments, were widely reported [54–56], increasing stress and reflecting global patterns during the pandemic [57]. Strengthening telemedicine, decentralized care, and resilient primary healthcare systems is essential to ensure continuity of care during future crises.

Overall, the COVID-19 pandemic amplified pre-existing vulnerabilities through interconnected social and structural pathways. Unlike single-domain studies, this research provides a comprehensive multidimensional assessment of co-occurring needs, with key priority areas identified as childcare, preventive health, and economic stability. Integration of quantitative and qualitative findings demonstrated strong convergence across childcare and education disruption, psychological distress, economic instability, and healthcare access barriers, confirming that these needs were interrelated rather than isolated phenomena and strengthening the validity of findings.

4.1. Strengths and Limitations

This study has several strengths, including a mixed-methods design enabling triangulation of quantitative and qualitative data, a large sample size ($n = 958$), and assessment across multiple domains, providing a comprehensive understanding of pandemic-related needs. Inclusion of rural and urban participants enhances contextual relevance, while qualitative rigor was ensured through established trustworthiness criteria. However, limitations include potential selection bias due to online sampling, underrepresentation of individuals with limited digital access, and cross-sectional design limiting causal inference. Self-reported data may introduce recall bias, and formal reliability testing was not conducted. The qualitative component did not explicitly document data saturation, and the predominance of South Indian and highly educated participants may limit generalizability.

4.2. Implications

The findings have important implications for community and public health nursing. Nurses are central to identifying socioeconomic and nutritional vulnerability and linking individuals to social protection systems. Integration of mental health screening and brief psychosocial interventions into routine care is essential given low service utilization. Nurses also play a key role in supporting families affected by childcare and educational disruptions, promoting digital health equity, and addressing vaccine hesitancy through effective risk communication. Strengthening nurse-led continuity-of-care models, including telehealth and chronic disease follow-up, is critical for healthcare resilience, supported by investments in workforce capacity and digital infrastructure.

5. Conclusion

In conclusion, this study demonstrates that the COVID-19 pandemic generated multidimensional and interconnected unmet needs across economic, nutritional, psychological, preventive, childcare, and healthcare domains. These findings highlight the complex interplay of social determinants shaping vulnerability during large-scale health emergencies. Strengthening preparedness requires integrated, equity-focused strategies that ensure continuity of essential services, enhance risk communication, expand mental health integration, and reinforce multisectoral coordination. Building resilient health systems must extend beyond infection control to include social protection, community engagement, and sustainable primary care strengthening.

Supplementary Materials: The following supporting information can be downloaded at the website of this paper posted on Preprints.org.

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