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Financial Livelihood of Dhaka Metropolis Slum Dwellers of Bangladesh during Covid-19: Underlying "Latent" Constructs

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Abstract

This research identified underlying factors/ constructs affecting urban slum dwellers' financial condition during COVID-19 in Bangladesh. This is an extension of the study that identified 51 attributes in seven categories: i) work/ job, ii) wage/ earning, iii) stakeholder, iv) savings/ expenditure/ debt, v) food, vi) family well-being, and vii) offspring. Statistical factor analysis technique is conducted for dimensionality reduction to group the 51 variables under common premise. The study identified fourteen factors/ constructs that affected households during Covid-19 pandemic. The most important latent factors/ construct is related to earning shortfall, followed by stakeholders standing, and spending/ expenses. The earning shortfall-related construct consisting of 10 of the 51 variables appears to be the most important as it explains 21.251% of the variability. The second important factor (stakeholder standing) explains 7.178% of the variability and consists of eight variables involving stakeholders. The third one (spending/ expenses) consisting of six variables explains 6.548% of the variability related to household expenditure. Other factors do not seem to be very significant as they explain very low variability (≤5%). The study noted that the factors and the group variables (Complex variables) identified in the coordination schema are quite coherent and consistent.

Keywords: *Earning Shortfall, Family Migration, Food Intake, Offspring Destiny, Spending/ Expenses, Stakeholders Standing.*

BACKGROUND/ ISSUE

Coronavirus disease 2019 (COVID 19), the most challenging crisis the world, has disrupted financially the life of people around the globe irrespective of income or class (Roy, 2020). Although it primarily emerged as a fatal, dangerous public health problem, Covid-19 appeared as global economic upheaval and its ubiquitous prevalence transcends monetarily all segments of society and economy across nations and cultures. However, it is the poorer and underprivileged group of society who became the worst victim of this pandemic which induced economic and financial shock mostly (Hossain, 2021).

While the developed world could extend relatively better support to the disadvantageous population with their well-established social security systems; in developing countries like Bangladesh, economically vulnerable people are left with deep uncertainties despite Government's sincere efforts in terms of expanded social protection programs, stimulus packages, and reliefs (Chauhan & Arora, 2020). Initially, response of Bangladesh Government to the COVID-19 pandemic has been shutdown of educational institutions, transport restrictions, and religious and political gathering limitations, and so on (Wilder-Smith, & Freedman, 2020). Such shutdown adversely affected almost every sector of the economy and disrupted the socio-economic situation of people and livelihoods (Kumar et al., 2021, Genoni, et al., 2020).

Although urban slums have been recognized as potential risky hives for the spread of viral respiratory infections, majority of the slum residents in Bangladesh facing serious financial consequences in terms of income losses, disrupted necessities, and heightened sufferings due to COVID-19 (Islam et al., 2020b: Hossain, 2021). Mamun (2023) analyzed the degree of lasting financial impact of pandemic and unveiled the real situation of the poorest cluster of society who genuinely absorbed the actual loss. In the study 51 simple/ specific variables are considered for understanding the financial implications of Covid-19 on slum dwellers. To avoid the complexity of dealing with so many variables a smaller set of underlying "factors" or themes to reveal hidden patterns and simplify complex data may be helpful. These factors will identify common structures, validate scales to make it easier to interpret results and perform further analysis.

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So, the question arises what underlying latent factors/ constructs[1] by grouping of variables under common premise contribute to financial implications affecting urban slum dwellers of Bangladesh during COVID-19. Not many studies have tried to explore such latent group variables. To understand such issues, it is important to know what deeper factors drive the underlying concepts in the data, and that one can uncover and work with them instead of dealing with the lower-level specific variables that cascade from them for this unprivileged group's financial implications during the Covid-19 period. Keeping these in mind this research tried to explore the underlying latent factors impacting the livelihood of the urban slum inhabitants of Dhaka, Bangladesh due to COVID-19.

This paper aims at exploring the factors that contribute to financial implications of the slum dwellers, and it is confined to the slums of Dhaka city, the capital of Bangladesh. Slums of Dhaka accommodate majority of the bottom of the pyramid people. Though Dhaka slum dwellers do not represent the slums of the entire country; their structure, mobility, versatility, income, and dynamism are unique and worth researching. By understanding the views of this group, government, concerned ministries, and NGOs can improve household risk communication, as well as strengthen the foundation of slum dwellers' wellbeing.

OBJECTIVES

This paper aims to identify the underlying latent constructs by grouping of variables under common premise that contribute to financial implications affecting urban slum dwellers of Bangladesh during COVID-19. Specifically, the study (i) recaps the dependent and independent variables, (ii) reduces the simple variables into a smaller set of underlying factors, and (iii) develops a regression model with the underlying factors and dependent variable.

METHODOLOGY

The study used both primary and secondary data and relevant literature appraisals. The primary data is collected through a structured questionnaire survey of 381 slum dwellers justifiable with 5% significance level, 5% precision, and 50% proportion. The questionnaire is pretested with 20 respondents. Secondary data is collected from various journal articles, reports, and relevant studies to understand the financial implications of slum dwellers in Bangladesh due to COVID-19 pandemic. A rigorous literature survey was undertaken to understand the necessity and application of such perception-based study on slum households of Dhaka metropolis, the capital of Bangladesh.

A coordination schema is developed to identify the parameter, simple variables, complex variables, and values (Appendix 1). The schema identified 51 explanatory variables, grouped into seven complex variables, and one dependent variable. The variables are identified through literature review, and taking views of knowledgeable persons, health experts, NGO workers, etc. Next the 51 variables are reduced by using statistical factor analysis[5] technique into a smaller set of underlying "constructs" or themes to reveal hidden patterns and simplify complex data.

A combination of non-probabilistic convenience, quota, and judgmental sampling are used for sample selection. The questionnaire contains statements (focusing the variables) using 5-point Likert scale to explore the financial implications of the slum dwellers during COVID-19. The study used face validity to identify the study variables. A high Cronbach's alpha of overall ($0.915 \geq 0.7$) and group responses suggest that the variables had acceptable internal consistencies among them and were reliable. As noted, the group-wise Cronbach's alphas are found quite high except for group E (Table 1).

Table 1. Groupwise reliability test results (Cronbach's alpha)

A (8)	B (9)	C (6)	D (9)	E (7)	F (9)	G (3)	Overall (52)
0.711	0.831	0.798	0.804	0.507	0.760	0.689	0.915

LITERATURE REVIEW

Urban slums in Bangladesh - A harsh reality

World Bank (2022) data showed that around 47.2% of the urban population of Bangladesh live in slums and around 5.3 million people are urban slum dwellers among which around 2.23 million are in metropolitan area slums. Urban slums are identified as unauthorized, temporary settlements with overcrowded and congested structures include maids, rickshaw pullers, taxi drivers, guards, garment workers, etc., with mean earnings below TK. 10,000 ($ 118) per month with destitute livelihood status (Rahman et al., 2022). The slum residents of each age, gender, education, and income group are at higher risk of financial backdrop due to Covid-19, and they are in a precarious situation without much work and income (Banik, Rahman, Sikder, & Gozal 2020).

Slum dwellers have been leading a very miserable life of poor socio-economic conditions and lack basic amenities, COVID-19 safety measures, required quarantine measures, social distancing, and lockdown strategy (Mamun & Fatima 2021; Sakamoto, Begum, & Ahmed, 2020, Wilkinson, 2020). Mamun & Fatima (2021) observed that slum dwellers do not have a very clear idea about COVID-19, its causes, prevention mechanism, etc. They are aware of some methods of self-protection and deterrence of transmission. In such dense urban slum reality, implementation of WHOs IPC guidelines on social distancing, handwashing, or isolation to combat the pandemic have almost been impossible, ineffective, and unsuccessful (Akter et al., 2021; Obasi & Anierobi, 2021).

This huge population with their extreme destitute living conditions expected as reservoirs for the spread of COVID-19 (World Bank, 2022, Kumar et al., 2021). Surprisingly, the reality was opposite. No reliable study has been found

to verify whether covid-19 has affected these overcrowded settlements more than other areas (Zaman, Hossain, & Matin, 2022). On the downside, although research supports slum dwellers have somehow been able to tackle these deadly, contagious diseases with minimum fatality (Zaman et al., 2022), it is evident by several studies that this poorer cluster of society has become the worst victim of COVID induced financial turmoil and shutdown. A nationwide joint study of PPRC–BIGD claimed that at the advent of pandemic in 2020, poverty levels have increased and a new poor' has been emerging (Kumar et al., 2021, Rahman et al., 2020).

Abrupt income and job loss

During COVID-19 both formal and informal businesses were severely hampered. As a result, slum people lost their job/ income completely and their lives along with their families fell under serious uncertainty and stress (Shammi et al., 2020). As an obvious impact, the economy faced a loss of 6.78% of its pre-COVID workforce (Islam et al., 2020c). The study noted that the informal sector, during the 1st lockdown, faced a loss of 11.1 million jobs countrywide and in urban area it was 1.08 million. As a sheer consequence, since the emergence of COVID, average income in the urban slums plunged by more than 80% and a total of 63% of slum dwellers became unemployed with per capita income fallen to BDT 27 ($0.32) per day by 82% from Tk. 108 ($1.30) (Sakamoto et al., 2020, Khan, 2022, Billah & Billah, 2021, Hossain, 2021).

Couple of surveys on urban poverty team indicate that 94.3 percent of the Dhaka slum dwellers were worried about unemployment and reduced earnings (Sumiya, et al., 2022, Sohel, et al., 2022). A simultaneous survey found a 75% income decline in urban slum respondents (Rahman, et al., 2020). Another study claimed that the daily income of bottom of the pyramid reduced by 64.37 percent (Kumar, et al., 2021). The study by Firoj, et al. (2021) revealed that majority of informal sector workers experienced an income drop among which wage level of urban informal workers was highest (Sohel, et al., 2022). Another survey noted that 50% of the slum respondents experienced reduced earning, among which income level of 47% was dropped to zero during the period (Islam, et al., 2020a, Chauhan & Arora 2020).

Food insecurity, general well-being, and other socio-economic issues

As an obvious consequence of such financial shock due to unexpected job loss and wage decline, urban poor had to withstand unimaginable suffering in terms of food insecurity, starvation, inaccessible healthcare, sanitation, and other well-beings. According to Rahman, et al. (2020), urban slum dwellers faced a 28% reduction in food expenditure, and a significant number (1,6-24%) of the poor could not afford 3 meals a day. Many people are found to reduce their consumption of nutritious food (no meat, milk, and reduced fruit intake) and increase consumption of cheaper, high-calorie food like rice and potatoes (Rahman, et al., 2022, Ruszczyk et al., 2020). The pandemic affected 74.67% of the respondents' food habits, 95.33% of respondents' child education and deteriorated basic services (Firoj, et al., 2021, Fattah et al., 2022). Similar socio-economic impact has been found in several other studies (Akter et al., 2021).

Survival/ Coping strategies

At the advent of pandemic, there were significant impacts on unemployment and underemployment of informal workers who, in turn, would end up with negative coping strategies such as forced sale of assets, high interest loans from informal moneylenders, or resorting to child labor (FAO, 2020). The gradual erosion of financial capacity compelled the vulnerable slum dwellers to follow the same surviving strategies such as taking loans, reducing expenses, consuming less food, forced selling of land, jewelry and goods, relatives and neighbor support, and government relief (Sohel, et al., 2022, Rahman, et al., 2020). All these resulted in exhausted savings, and pressure on non-food expenditures, such as rent and utility payments, non-emergency medical costs, educational expenses, etc. (Rahman, et al., 2022). On the other hand, a consistent rise in outstanding loans negatively affected long-term financial capability and their livelihood features became fragile enormously (Hossain, 2021; Ruszczyk et al., 2020; Sohel, et al., 2022).

DATA ANALYSIS AND FINDINGS

In this section a recapitulation of the study by Mamun (2023) is made of the financial impact of COVID-19 on the livelihood of Dhaka metropolis slum dwellers of Bangladesh. The recap includes i) demographic features of the respondents, ii) mean indices of simple and group variables, and iii) implications of group variables. These findings are already published in detail in the paper by Mamun (2023). Finally, as a continuation of the previous study factor analysis is conducted to group the variables into coherent latent groups. The results of the 51 variables are reported to identify the underlying factors/ constructs regarding the financial implications of Covid-19 (Section 5.0).

Demographic Features of the Respondents

This study surveyed 381 slum dwellers of which 303 (79.5%) are male and 78 (20.5.4%) are female. Of the total respondents 68 (17.8%) are single and the rest 313 (82.2%) are married. In addition, 108 (28.3%) have a nuclear family[2] and 273 (71.7%) live in a joint[3] or extended family[4] structure. Education wise 55 (14.4%) have no formal education, 136 (35.7%) have primary education, 102 (26.8%) have secondary education, 77 (20.1%) have higher secondary education and the rest 11 (10.0%) have other educational expertise (e.g., vocational, trade certificates).

Profession wise 154 (40.4%) are different types of informal workers, 41 (10.8%) are rickshaw pullers, 39 (10.2%) are drivers, 36 (9.4%) are day laborers, 27 (6.2%) are

shopkeepers, 24 (6.3%) are maids, 20 (5.2%) are housewives and the rest 40 (13.8%) has other professions. The average age of the respondents is 33.44 years with a deviation of 9.37 years (Range 15 years ~ 80 years). Average monthly income of the respondents is Tk. 12,170.13 ($143.18) with a deviation of Tk. 5,292.98 ($62.27) and range of Tk. 1000 ($12) ~ Tk. 40,000 ($471). Of the total respondents 49 (11.3%) have no regular income.

Mean Indices of Simple and Group Variables

Mamun (2023) analyzed the slum dwellers' financial status during COVID-19 using 52 variables (51 independent variables with specific implication and one dependent variable focusing overall implication). In the study the respondents are asked to give their financial standing during COVID-19 using a 5-point Likert scale (1: strongly disagree, 2: disagree, 3: neutral, 4: agree, 5: strongly agree). The variables are designed in statement form in negative tone. As noted, the 51 independent variables are grouped into seven complex variables focusing on different finance related implications. Based on the responses, the mean indices of individual variables, group variables and overall impact are analyzed and tested for evaluating the financial implication of Covid-19 on their household (Table 2).

Table 2. Group mean indices including simple variables

Variables	μ	Variables	μ
A. Work/Job related implications	3.85	Spend more as transportation fare increased	4.04
Lost my job/livelihood	3.71	Expenditure surpassed income	4.14
Lost my part time job	3.71	Spend more since price of all food items including rice increased	4.14
Job insecurity increased	3.97	Pay extra fare to reach workplace	4.08
Not getting enough work	4.00	Take loan from informal sources at high interest rate	3.81
Shift from a higher level job to a lower level job	3.76	Failed to repay loan	4.04
Increased work burden	3.76	**E. Food related implications**	**3.74**
Other income generating activities reduced	4.10	Facing difficulties to arrange daily meals	3.97
Go to my hometown as no job available	3.82	Consuming less quantity of food	3.86
B. Wage/ Salary related implications	3.82	Cannot purchase baby food	3.82
Salary curtailed	3.90	Consuming reduced amount of protein and healthy food	3.90
No regular income for months	3.80	Family members are living on dry food only	3.28
Lost my overtime pay	3.76	Sometimes family members need to starve	3.60
Not received annual increment	3.85	Cannot purchase enough supplies/ items	3.75
Not received festival bonuses	3.75	**F. Family well-being related implications**	**3.84**
Family/household income reduced	3.99	Difficulty in payment of utility and other bills	4.09
Tips has reduced	3.77	Family members are living without required medical care/ services for not being able to bear healthcare cost	4.02
Household income reduced more among females than males	3.69	Not able to purchase cleanliness/ hygiene kits (mask, sanitizer, soap, etc.)	3.96
On average, the family lost more than 50% of prepandemic period income	3.89	Walk to my work and other places instead of using transport	3.94
C. Stakeholder related financial implications	3.80	Failed to pay house/shop/stall rent for months	3.85
Income reduced due to less number of customers	3.73	Family became homeless	3.53
Income reduced since educational institutions are closed	3.66	Send my family to village	3.94
Income reduced since purchasing power of customers decreased	3.79	Sell source of income/ livelihood (rickshaw/ autorickshaw/ van/ photocopy machine, etc.)	3.54
Income reduced since the number of passengers using rickshaw, CNG driven autorickshaw decreased	3.69	Sell my valuables (ornaments, property, etc.) to survive	3.73
Income reduced due to lock down announced by government	4.11	**G. Offspring related implications**	**3.20**
Income reduced as business activities have slowed down	3.82	Involve minor family members in odd jobs to tackle economic hardship	3.70

D. Savings, Expenditure & Debt related implications	**4.07**	Decided to sell our newborn baby for not being able to pay hospital bills	2.86
Cannot save any more	4.13	Got my underaged girl married to combat insecurity of food*	3.04
Spending from my savings	4.11	**H. Overall financial implication**	3.82
Spend more due to commodity price hike	4.11	Overall, COVID-19 impacted negatively the financial wellbeing of my family	4.30
* Not significantly different from 3 (Indifference/ neutral) at 5% level of significance			

Financial Implications of Group/ Categorical Variables

The groupwise analysis of financial implication on the families shows that saving/expense/debt related financial implication (4.07) is the major concern for the slum dwellers followed by family well-being (3.90). Next in the queue are work/job (3.85), wage/salary (3.82) and stakeholder (3.80) related financial implications. Least impacted implications are family food (3.74) and offspring (3.37) related attributes. Only the group mean of "Offspring" is not significantly different from 3 (Indifferent) at 5% level. Overall, group means are found significantly different at 5% level (Table 3).

Table 3. Descriptive Statistics of the Groups

Groups	Items	Mean	Std. Deviation	Minimum	Maximum
Work/ Job	8	3.8538	0.14909	3.71	4.10
Wage/ Salary	9	3.8222	0.09311	3.69	3.99
Stakeholder	6	3.8000	0.16322	3.66	4.11
Saving/ Expense/ Debt	9	4.0667	0.10368	3.81	4.14
Family food	7	3.7400	0.23473	3.28	3.97
General family well-being	9	3.8444	0.20231	3.53	4.09
Offspring*	3	3.2000	0.44227	2.86	3.73
Overall	51	3.8237	0.25515	2.86	4.14
* Mean is not significantly different from 3 (Indifferent) at 5% level of significance					

Work/ Job related implications (μ=3.8538, σ=0.14909)

The work/income related implications during COVID-19 contain eight simple variables. It is noted that the slum dwellers strongly agreed to each of the implications. But the most emphasized ones are income generating activities has reduced (4.10), not getting enough work (4.0), and job insecurity has increased (3.97). Next emphasized ones are go to their hometown as no jobs available (3.82), shift from a higher position to a lower position (3.76), increased work burden (3.76), job loss (3.76), part-time job loss (3.71). Overall, it can be said that during covid-19, the slum dwellers have serious work/job related implications during COVID-19 (3.86).

Wage/ Income related implications (μ=3.8222, σ=0.09311)

The wage/earning related implications during COVID-19 contain nine repercussions. The survey respondents assented that family income reduction (3.99), curtail of salary (3.90) and lost more than 50% of the pre-pandemic income (3.89) are the leading implications. These are followed by no annual increment (3.85), no regular income (3.80), reduced tips (3.77), lost overtime pay (3.76), no festival bonuses (3.75) and females lost more than males (3.69). Overall, it can be said that during covid-19, the slum dwellers have serious wage/income related implications during COVID-19 (3.82).

Stakeholder related implications (μ=3.8000, σ=0.16322)

The stakeholder-related implications during COVID-19 have six consequences. The study tried to identify the respondents' perception regarding different institutional scenarios that have financial implication in their livelihood. The important ones are government lockdown (4.11) and reduced business activities (3.82). Others include decreased purchase power of the customers (3.79), reduced number of customers (3.73), reduced number of passengers (3.69) and closure of educational institutions (3.66). All these affected their financial condition. Overall, it can be said that during covid-19, the slum dwellers have severe stakeholder related implications (3.97).

Savings, expenditures and debt related implications (μ=4.0667, σ=0.10368)

The savings/expenditure/debt related implications during COVID-19 have nine concerns. The important ones are expenditure surpassed income (4.14), spending more as all food price increased (4.14), cannot save anymore

(4.13), spending from savings (4.11), and spending more as commodity price hiked (4.11). Others include extra fair to reach workplace (4.08), increased transportation fare (4.04), failed to repay loan (4.04) and taking loan at high interest rate from informal sector (3.81). Overall, it can be said that during covid-19, the slum dwellers have grave savings/ expenditure/ debt related implications during COVID-19 (4.07).

Family food related implications (μ=3.7400, σ=0.23473)

The food related implications during COVID-19 have seven attributes. The important ones are difficulty in arranging three meals a day (3.97), consuming less protein and healthy food (3.90), consuming less amount of food (3.86), and cannot purchase baby food (3.82). Others include cannot purchase enough supplies/ items (3.75), sometimes need to starve (3.60), and living on dry food only (3.28). Overall, it can be said that during covid-19, the slum dwellers have some concern for food related implications during COVID-19 (3.74).

Family well-being related implications (μ=3.8444, σ=0.20231)

The family well-being related implications during COVID-19 have seven traits. The important attributes in this group are difficulty in payment of utility bills (4.09), and family members are without required health care services (4.02). These are followed by not being able to purchase cleanliness/ hygiene kits (3.96), walking to places instead of transport (3.94), sending family to village (3.94) and failure to pay house/ shop/ stall rent (3.85). Others least agreed attribute is the family became homeless (3.53). Overall, it can be said that during covid-19, the slum dwellers have serious concern for family well-being related implications during COVID-19 (3.90).

Offspring related implications (μ=3.2000, σ=0.44227)

The offspring related implications during COVID-19 have three attributes. Here the responses are quite diverse: in one case they agreed, in one case they disagreed and in one case the response is indifferent. They agreed regarding involving minor family members in odd jobs (3.70). But they disagreed that they need to sell their newborn baby for not being able to pay the hospital bills (3.90). They were indifferent regarding getting their underaged girl married (3.04). Overall, it can be said that during covid-19, the slum dwellers have some concern for offspring related implications during COVID-19 (3.20).

Overall Financial Implications (μ=4.30, σ=0.25515)

Overall, the study found that COVID-19 ruthlessly impacted the financial wellbeing of their family (4.30). Mean index of the 51 variables (3.82) also support this but to a lesser extent.

GROUPING OF VARIABLES BY FACTOR ANALYSIS

Factor analysis with varimax rotation[6] is conducted on the data for grouping of variables under common premises. The result grouped the 51 variables into 14 constructs (factors)[7] with eigen value[8] greater than one (eigen value≥1) that explained 64.894% of the total variance[9] (Table 4). The naming of the factors[10] is based on the variables that loaded highly on a factor, and the underlying concept or characteristic they share. The factor analysis of 51 variables with 381 sample[11] is found adequate (KMO[12]=0.842≥0.5) and valid (Bartlett's test of sphericity indicates a significance level of 0.000). The communalities[13], of the variables that constituted the factors, are found to be very strong, which indicates strong relationships among the variables (Appendix 2).

Table 4. Total Variance Explained

Component/Factor	Extraction Sums of Squared Loadings		
	Total	Variance (%)	Cumulative %
Earning shortfall	10.838	21.251	21.251
Stakeholders standing	3.661	7.178	28.429
Spending/Expenses	3.339	6.548	34.977
Food intake	2.120	4.157	39.133
Offspring destiny	1.828	3.584	42.717
Family migration	1.589	3.115	45.832
Property loss	1.437	2.819	48.651
Loan/Income	1.391	2.728	51.378
On foot movement	1.290	2.529	53.907
Hygiene kits	1.209	2.371	56.278
Meals and starvation	1.180	2.314	58.592
Dry food intake	1.146	2.247	60.839
Work burden	1.058	2.075	62.914
Income & loan repayment	1.010	1.980	64.894

The 14 constructs with corresponding variables and their factor loadings [14] are shown in table 5. The high factor loadings in each group shows strong correlation between the factor and the corresponding variables. As noted, the first factor (Earning shortfall) consists of 10 of the 51 variables appears to be the most important as it explains 21.251% of the variability. The second important factor (Stakeholders standing) explains 7.178% of the variability and consists of eight variables. The third one (Spending/Expenses) consisting of six variables explains 6.548% of the variability. Other factors do not seem to be very significant as they explain very low variability (≤5%). Further it is noted that the variables under the factors and the seven groups (complex variables) formed in the schema are quite consistent. The details of the factor analysis are as follows.

Table 5. Factors with corresponding variables

Factors with variables	Factor loading	Factors with variables	Factor loading	Factors with variables	Factor loading
Factor 1: Earning shortfall (σ^2=21.251%)		Spending on my savings (D)	0.687	**Factor 8: Loan/ Income (σ^2=2.728%)**	
Not received annual increment (B)	0.776	Expenditure surpassed income (D)	0.679	Needed to take loans from informal sources with high interest (D)	0.735
Lost overtime pays (B)	0.749	Spend more as transportation fare increased (D)	0.609	Household income reduced more among females (B)	0.506
Shifted from a higher-level job to lower-level job (A)	0.695	Spend more since price of all food items including rice has increased (D)	0.474	Tips reduced (B)	0.415
Not received festival bonuses (B)	0.664	Pay extra fare to reach workplace (D)	0.366	Job insecurity increased (A)	0.395
Lost job/livelihood (A)	0.663	**Factor 4: Food intake (σ^2=4.157%)**		**Factor 9: On foot movement (σ^2=2.529%)**	
No regular income for months (B)	0.640	Consuming reduced amount of protein and healthy diet (E)	0.825	Walk to work and other places (F)	0.667
Family/household income reduced (B)	0.575	Difficulty in payment of utility and other bills (F)	0.683	Other income generating activity reduced (A)	0.383
Salary has been curtailed (B)	0.571	Consuming less quantity of food (E)	0.544	**Factor 10: Hygiene kits (σ^2=2.371%)**	
Not getting enough work (A)	0.514	Cannot purchase baby food (E)	0.490	Not able to purchase hygiene kits (F)	0.788
Lost part time job (A)	0.426	Without medical service for not being able to bear health care cost (F)	0.470	On average, families lose 50% of pre-pandemic income (B)	0.436
Factor 2: Stakeholders standing (σ^2=7.178%)		Cannot save anymore (D)	0.407	**Factor 11: Meals & starvation (σ^2=2.314%)**	
Purchasing power of customer reduced (C)	0.756	Had to involve minor family members in odd jobs (G)	0.335	Difficult to arrange three meals a day (E)	0.709
Business activities have slowed down (C)	0.710	**Factor 5: Offspring destiny (σ^2=5.584%)**		Family members need to starve (E)	0.418
Could not purchase enough supplies/items (E)	0.708	Got underage daughter married to combat food insecurity (G)	0.859	**Factor 12: Dry food intake (σ^2=2.247%)**	
Passengers using rickshaw, autorickshaw decreased (C)	0.696	Sell newborn baby for not being able to pay hospital bills (G)	0.826	Family members living on dry food (E)	0.599
Less number of customers (C)	0.641	**Factor 6: Family migration (σ^2=3.115%)**		**Factor 13: Work burden (σ^2=2.075%)**	
Educational institutions closed (C)	0.626	Forced to send family to village (F)	0.802	Work burden increased (A)	0.822

Needed to sell source of income/livelihood (F)	0.491	Needed to go to hometown as there is no job at capital (A)	0.702	**Factor 14: Income & loan repayment (σ^2=1.98%)**	
Sold my valuables to survive (F)	0.467	**Factor 7: Property loss (σ^2=2.819%)**		Income reduced due to lockdown (C)	-0.472
Factor 3: Spending/ Expenses (σ^2=6.548%)		Family became homeless (F)	0.706	Failed to repay loan (D)	0.419
Spend more as commodity price hiked (D)	0.760	Could not pay shop/house/stall rent for months (F)	0.624		

Factor 1: Earning shortfall (σ^2=21.251%)

As noted, factor 1 (**Earning shortfall**) consists of 10 of the 51 variables appears to be the most important explaining 21.251% of the variability (Table 6). It contains mostly the variables related to "**Work/ Job**" (4 out of 8 of Group A) and **"Wage/ Salary"** (6 out of 9 of Group B). The high factor loadings of the variables in the group shows strong correlation between the factor and the corresponding variables. The two most important variables with high factor loadings (factor loadings≥0.70) are i) Not received annual increment (0.776), and ii) Lost overtime pays (0.749). Next in the list (factor loadings≥0.60) are i) Shift from a higher-level job to lower-level job (0. 695), ii) No receipt of festival bonuses (0. 664), iii) Loss of job/ livelihood (0. 663), and iv) No regular income for months (0. 640). A little less important variables are i) Family/household income reduced (0.575), ii) Salary has been curtailed (0.571), iii) Not getting enough work (0.514), and iv) Lost part time job (0.426). As can be seen, most of the variables are related to the respondents' earnings. Hence it can be concluded that Covid 19 affected the earnings of the families.

Table 6. Factor 1 (Earning shortfall) variables

Factor variables	Factor loading	Factor variables	Factor loading
No receipt of annual increment (B)	0.776	No regular income for months (B)	0.640
Lost overtime pays (B)	0.749	Family/household income reduced (B)	0.575
Shift from a higher-level job to lower-level job (A)	0.695	Salary has been curtailed (B)	0.571
No receipt of festival bonuses (B)	0.664	Not getting enough work (A)	0.514
Loss of job/livelihood (A)	0.663	Lost part time job (A)	0.426

Factor 2: Stakeholders standing (σ^2=7.178%)

Factor 2 (**Stakeholders standing**) consists of 8 of the 51 variables and explains 7.178% of the variability (Table 7). It includes five out of six attributes of **Stakeholders related implications (Group C)**. The rest three in this factor are food (1) and family well-being (2) related. The high factor loadings of the variables in the group shows strong correlation between the factor and the corresponding variables. The three most important variables with high factor loadings (factor loadings≥0.70) are i) Purchasing power of customer reduced (0.710), ii) Business activities have slowed down (0.749), and iii) Could not purchase enough supplies/items (0.708). Next in the list (factor loadings≥0.60) are i) Passengers using rickshaw, autorickshaw decreased (0. 696), ii) A smaller number of customers (0. 641), and iii) Educational institutions closed (0. 626). Less important variables are i) Needed to sell source of income/livelihood (0.491), and ii) Sold my valuables to survive (0.467). As can be seen, most of the variables are stakeholder related attributes. Hence it can be concluded that Covid 19 affected not only the families but also their stakeholders.

Table 7. Factor 2 (Stakeholder standing) variables

Factors with variables	Factor loading	Factors with variables	Factor loading
Purchasing power of customer reduced (C)	0.756	Less number of customers (C)	0.641
Business activities have slowed down (C)	0.710	Educational institutions closed (C)	0.626
Could not purchase enough supplies/items (E)	0.708	Needed to sell source of income/livelihood (F)	0.491
Passengers using rickshaw, autorickshaw decreased (C)	0.696	Sold my valuables to survive (F)	0.467

Factor 3: Spending/ Expenses (σ^2=6.548%)

The factor 3 (**Spending/Expenses**) consists of 6 of the 51 variables explaining 6.548% of the variability (Table 8). It contains mostly the variables related to "**Spending/ Expenses/ Debt related implications" (**6 out of 9 of Group D). The high factor loadings of the variables in the group shows strong correlation between the factor and the corresponding variables. The

most important variable with high factor loadings (factor loadings≥0.70) is i) More spending due to commodity price hike (0.760). Next in the list (factor loadings≥0.60) are i) Spending on savings (0.687), ii) Expenditure surpassed income (0.679), and iii) Spend more on transportation as fare increased (0.609). Least important variables are i) Spend more since price of all food items including rice has increased (0.474), and ii) Pay extra fare to reach workplace (0.366). As can be seen, most of the variables are related to the respondents' spending/expenses. Hence it can be concluded that Covid 19 affected the spending/expenses of the families.

Table 8. Factor 3 (Spending/expenses) variables

Factors with variables	Factor loading	Factors with variables	Factor loading
More spending due to commodity price hike (D)	0.760	Spend more on transportation as fare increased (D)	0.609
Spending on savings (D)	0.687	Spend more since price of all food items including rice has increased (D)	0.474
Expenditure surpassed income (D)	0.679	Pay extra fare to reach workplace (D)	0.366

Factor 4: Food intake (σ^2=4.157%)

Factor 4 (**Food intake**) consists of 7 of the 51 variables explaining 4.157% of the variability (Table 9). It contains mostly the variables related to **family food consumption (**3 out of 7 of Group E). The high factor loadings of the variables in the group shows strong correlation between the factor and the corresponding variables. The most important variable with high factor loadings (factor loadings≥0.80) is i) Consuming reduced amount of protein and healthy diet (0.825). Next in the list (factor loadings≥0.50) are i) Difficulty in payment of utility and other bills (0.683), ii) Consuming less quantity of food (0.544), and iii) Cannot purchase baby food (0.490). Least important variables are i) Without medical service for not being able to bear health care cost (0.470), ii) Cannot save anymore (0.407), and iii) Had to involve minor family members in odd jobs (0.335). As noted, the most important variables are related to the respondents' family food intake. Hence it can be concluded that Covid-19 affected the food consumption of the families.

Table 9. Factor 4 (Food intake) variables

Factors with variables	Factor loading	Factors with variables	Factor loading
Consuming reduced amount of protein and healthy diet (E)	0.825	Without medical service for not being able to bear health care cost (F)	0.470
Difficulty in payment of utility and other bills (F)	0.683	Cannot save anymore (D)	0.407
Consuming less quantity of food (E)	0.544	Had to involve minor family members in odd jobs (G)	0.335
Cannot purchase baby food (E)	0.490		

Factor 5: Offspring destiny (σ^2=5.584%)

Factor 5 (**Offspring destiny)** (with two variables) contains two of the 3 off-spring related variables of **Group G** (Table 10). Here both the variables have very high factor loadings that show very strong correlation between the factor and the corresponding variables. The variables with high factor loadings (factor loadings≥0.80) are i) Got underage daughter married to combat food insecurity (0.859), and ii) Sell newborn baby for not being able to pay hospital bills (0.826). Hence it can be concluded that Covid-19 affected not only the families but also their offsprings.

Table 10. Factor 5 (Offspring destiny) variables

Factors with variables	Factor loading	Factors with variables	Factor loading
Got underage daughter married to combat food insecurity (G)	0.859	Sell newborn baby for not being able to pay hospital bills (G)	0.826

Factor 6: Family migration (σ^2=3.115%)

Factor 6 (**Family migration)** contains two variables related to family migration (Table 11). Here both the variables have high factor loadings (factor loadings≥0.70) showing very strong correlation between the factor and the corresponding variables. The variables are i) Had to send family to village (0.80), and ii) Needed to go to hometown as there is no job at capital (0.702). Hence it can be concluded that Covid-19 forced families to migrate to hometown.

Table 11. Factor 6 (Family migration) variables

Factors with variables	Factor loading	Factors with variables	Factor loading
Forced to send family to village (F)	0.802	Needed to go to hometown as there is no job at capital (A)	0.702

Factor 7: Property loss (σ^2=2.819%)

Factor 7 (**Property loss)** contains two variables related to general family well-being related implications (Table 12). Here both the variables have quite high factor loadings (factor loadings≥0.60) showing strong correlation between the factor and the corresponding variables. The variables are i) Family became homeless (0.706), and ii) Could not pay shop/house/stall rent for months (0.624). Hence it can be concluded that Covid 19 forced families to lose property.

Table 12. Factor 7 (Property loss) variables

Factors with variables	Factor loading	Factors with variables	Factor loading
Family became homeless (F)	0.706	Could not pay shop/house/stall rent for months (F)	0.624

Factor 8: Loan/ Income (σ^2=2.728%)

Factor 8 (**Loan/ Income)** contains four variables (Table 13). Here one variable has high factor loadings (factor loadings≥0.70) and the rest three have low factor loadings. The variables are i) Needed to take loans from informal sources at high interest (0.735), ii) Household income reduced more among females (0.506), iii) Tips reduced (0.415) and Job insecurity increased (0.395). Hence it can be concluded that Covid-19 forced families to take loans with high interest rates, as well as family earnings reduced.

Table 13. Factor 8 (Debt/Earning related implications) variables

Factors with variables	Factor loading	Factors with variables	Factor loading
Needed to take loans from informal sources with high interest rates (D)	0.735	Tips reduced (B)	0.415
Household income reduced more among females (B)	0.506	Job insecurity increased (A)	0.395

Factor 9: On foot movement (σ^2=2.529%)

Factor 9 (**On foot movement)** contains two variables (Table 14). Here one variable has high factor loadings (factor loadings≥0.60) and the other has low factor loadings. The variables are i) Walk to work and other places (0.667), ii) Other income generating activity reduced (0.383). Hence it can be concluded that Covid 19 forced families to walk to places rather than transport as family earnings reduced.

Table 14. Factor 9 (On foot movement) variables

Factors with variables	Factor loading	Factors with variables	Factor loading
Walk to work and other places (F)	0.667	Other income generating activity reduced (A)	0.383

Factor 10: Hygiene kits (σ^2=2.529%)

Factor 10 (**Hygiene kits)** contains two variables (Table 14). Here one variable has high factor loadings (factor loadings≥0.60) and the other has low factor loadings. The variables are i) Unable to purchase hygiene kits (0.788), ii) On average, families lose 50% of pre-pandemic income (0.436). Hence it can be concluded that Covid 19 made families unable to purchase hygiene kits as family earnings reduced.

Table 14. Factor 10 (Hygiene kits) variables

Factors with variables	Factor loading	Factors with variables	Factor loading
Unable to purchase hygiene kits (F)	0.788	On average, families lose 50% of pre-pandemic income (B)	0.436

Factor 11: Meals and starvation (σ^2=2.314%)

Factor 11 (**Meals and starvation)** contains two variables (Table 15). Here one variable has high factor loadings (factor loadings≥0.70) and the other has low factor loadings. The variables are i) Difficult to arrange three meals a day (0.709), ii) Family members need to starve (0.418). Hence it can be concluded that Covid 19 made families unable to arrange meals three times a day as family earnings reduced.

Table 15. Factor 11 (Meals and starvation) variables

Factors with variables	Factor loading	Factors with variables	Factor loading
Difficult to arrange three meals a day (E)	0.709	Family members need to starve (E)	0.418

Factor 12: Dry food intake (σ^2=2.247%)

Factor 12 (**Dry food intake)** contains only one variable related to family food (E) with a moderate factor loading (Table 16). The variable is i) Family members living on dry food (0.599). Hence it can be concluded that Covid 19 forced families to live on dry food (e.g., flat rice, puffed rice).

Table 16. Factor 12 (Dry food intake) variables

Factors with variables	Factor loading	Factors with variables	Factor loading
Family members living on dry food (E)	0.599		

Factor 13: Work burden (σ^2=2.075%)

Factor 13 (**Work burden)** contains only one variable with a very high factor loading (Table 17). It mainly focuses on **work/ job related implications (Group A)** and explains only 2.075% variability. The variable is i) Work burden increased (0.822). Hence it can be concluded that Covid 19 has increased the workload of the family members.

Table 17. Factor 13 (Work burden) variables

Factors with variables	Factor loading	Factors with variables	Factor loading
Work burden increased (A)	0.822		

Factor 14: Income and loan repayment (σ^2= 1.980%%)

Factor 14 (**Income and loan repayment)** contains two variables with low factor loadings (Table 18). It explains only 1.980% variability. The variables are i) Income reduced due to lockdown by government (-0.472) and ii) Failed to repay loan (0.419). Hence it can be concluded that Covid-19 has reduced the income and loan repayment capacity of the family members.

Table 18. Factor 14 (Income and loan repayment) variables

Factors with variables	Factor loading	Factors with variables	Factor loading
Income reduced due to lockdown by government (C)	-0.472	Failed to repay loan (D)	0.419

Regression Analysis with the Factors

Factor analysis has identified 14 factors as independent variables. Associated with these 14 factors are 51 variables which independently will affect the overall outcome of the research. A regression analysis (both enter and stepwise method) is conducted taking these 14 factors as the independent variable and the **"Covid-19 impacted negatively the financial wellbeing"** as the dependent one (Table 19). The model is found significant (0.000) with an adjusted r^2 of 33.6%. The regression factors 6, 8, 11, 12, 13 and 14 are found to be insignificant at 5% level of significance. Four factors have negative coefficient (5, 11, 13, 14), of them only one (5) is significant at 5% level. Coefficientwise the contributory factors in descending order are Spending/ Expenses (3) (0.287), Hygiene kits (10) (0.210), Earning shortfall (1) (0.140), Food intake (4) (0.118), Property loss (7) (0.113), On foot movement (9) (0.098), Stakeholders standing (2) (0.089) and Offspring destiny (5) (-0.091).

Table 19. Regression model with 14 factors

Factors	Factor label	Coefficients	Standardized Coefficients	Significance (p-value)
(Constant)		4.296	-	0.000
REGR factor 1	Earning shortfall	0.140	0.186	0.000
REGR factor 2	Stakeholders standing	0.089	0.118	0.006
REGR factor 3	Spending/Expenses	0.287	0.381	0.000
REGR factor 4	Food intake	0.118	0.157	0.000
REGR factor 5	Offspring destiny	-0.091	-0.121	0.004
REGR factor 6	Family migration	0.003	0.005	0.913*

REGR factor 7	Property loss	0.113	0.150	0.000
REGR factor 8	Loan/Income	0.023	0.030	0.473*
REGR factor 9	On foot movement	0.098	0.130	0.002
REGR factor 10	Hygiene kits	0.210	0.279	0.000
REGR factor 11	Meals and starvation	-0.036	-0.048	0.257*
REGR factor 12	Dry food intake	0.176	0.143	0.398*
REGR factor 13	Work burden	-0.041	-0.054	0.201*
REGR factor 14	Income & loan repayment	-0.033	-0.043	0.304*
N.B.: Dependent Variable: Slum dwellers are affected during Covid-19, * insignificant at 5% level				

SUMMARY, CONCLUSION AND RECOMMENDATION

This research attempted to dip into different underlying factors/ constructs affecting urban slum dwellers' financial condition during COVID-19 in Bangladesh. Specifically, this study explored the underlying factors/ constructs using 51 financial implications of the slum residents to reveal hidden patterns by grouping them. The study used both primary and secondary data and relevant literature appraisals. The primary data is collected through a pre-tested structured questionnaire survey of 381 slum dwellers. A rigorous literature survey is undertaken to develop a coordination schema to identify the parameter, simple variables, complex variables, and values.

A combination of convenience, quota, and judgmental sampling was used for sample selection. The questionnaire made use of a 5-point Likert scale to explore the financial implications of the slum dwellers of Dhaka city during COVID-19. Factor analysis, t-test, regression analysis are used to analyze the data. The study used face validity to identify the study variables. High Cronbach's alpha of the group and overall responses suggest that the responses are consistent and reliable. This research is confined to only the slums of Dhaka city, the capital of Bangladesh which accommodate majority of the bottom of the pyramid people.

This study surveyed 381 slum dwellers of which 303 (79.5%) are male and 78 (20.5.4%) are female. Of the total respondents 68 (17.8%) are single and the rest 313 (82.2%) are married. In addition, 108 (28.3%) have a nuclear family and 273 (71.7%) live in a joint or extended family structure. Education-wise 55 (14.4%) have no formal education, 136 (35.7%) have primary education, 102 (26.8%) have secondary education, 77 (20.1%) have higher secondary education and the rest 11 (10.0%) have other educational expertise (e.g., trade certificates). Profession wise 154 (40.4%) are different types of informal workers, 41 (10.8%) are rickshaw pullers, 39 (10.2%) are drivers, 36 (9.4%) are day laborers, 27 (6.2%) are shopkeepers, 24 (6.3%) are maids, 20 (5.2%) are housewives and the rest 40 (13.8%) has other professions. The average age of the respondents is 33.44 years. Average monthly income of the respondents is Tk. 12,170.13 ($143.18). Overall, the respondents mentioned that COVID-19 ruthlessly impacted the financial wellbeing of their family.

Factor analysis is conducted for grouping the 51 variables under common premises and resulted into 14 constructs/ factors (with eigen value≥1) explaining 64.894% variability. The factor analysis of 51 variables with 381 sample is found adequate (KMO=0.842≥0.5) and valid (significance level of 0.000). The communalities of the variables that constituted the factors are found to be strong, showing robust relationships among the variables. The high factor loadings in each group shows strong correlation between the factors and the corresponding variables. Further it is noted that the variables under the factors and the seven complex variables formed in the schema are quite consistent.

Factor 1 (Earning shortfall) consists of 10 of the 51 variables appears to be the most important as it explains 21.251% of the variability mainly related to "**Work/ Job"** and **"Wage/ Salary"**. Here the two most important variables with high factor loadings are i) Not received annual increment (0.776), and ii) Lost overtime (0.749). Next in the list are i) Shift from a higher-level job to lower-level job (0. 695), ii) No receipt of festival bonuses (0. 664), iii) Loss of job/ livelihood (0. 663), and iv) No regular income for months (0. 640). A little less important variables are i) Family/ household income reduced (0.575), ii) Salary has been curtailed (0.571), iii) Not getting enough work (0.514), and iv) Lost part time job (0.426). As can be seen, most of the variables are related to the respondents' earnings. Hence it can be concluded that Covid 19 affected the earnings of the families.

Factor 2 (Stakeholders standing) consists of eight variables including mainly stakeholder related implications explaining 7.178% of the variability; but three in this group are food (1) and family well-being (2) related. The three most important variables in this group with high factor loadings are i) Purchasing power of customer reduced (0.710), ii) Business activities have slowed down (0.749), and iii) Could not purchase enough supplies/ items (0.708). Next in the list are i) Passengers

using rickshaw, autorickshaw decreased (0. 696), ii) A smaller number of customers (0. 641), and iii) Educational institutions closed (0. 626). Less important variables are i) Needed to sell source of income/ livelihood (0.491), and ii) Sold my valuables to survive (0.467). As can be seen, most of the variables are stakeholder related attributes. Hence it can be said that Covid 19 affected not only the families but also their stakeholders.

Factor 3 (Spending/ Expenses) consisting of six variables explains 6.548% of the variability consists mostly of spending/ expenses related implications. The most important variable with high factor loadings is i) More spending due to commodity price hike (0.760). Next in the list are i) Spending on savings (0.687), ii) Expenditure surpassed income (0.679), and iii) Spend more on transportation as fare increased (0.609). Least important variables are i) Spend more since price of all food items including rice has increased (0.474), and ii) Pay extra fare to reach workplace (0.366). As can be seen, most of the variables are related to the respondents' spending/ expenses. Hence it can be concluded that Covid 19 affected the spending/ expenses of the families. Other factors do not seem very significant as they explain very low variability (≤5%).

Factor 4 (Food intake) consists of 7 of the 51 variables explaining 4.157% of the variability. It contains mostly variables related to family food consumption. The most important variable is i) Consuming reduced amount of protein and healthy diet (0.825). Next in the list are i) Difficulty in payment of utility and other bills (0.683), ii) Consuming less quantity of food (0.544), and iii) Cannot purchase baby food (0.490). Least important variables are i) Without medical service for not being able to bear health care cost (0.470), ii) Cannot save anymore (0.407), and iii) Had to involve minor family members in odd jobs (0.335). As noted, the most important variables are related to the respondents' family food related. Hence it can be concluded that Covid 19 affected the food consumption of the families.

Factor 5 (Offspring combat) contains two off-spring related variables with very high factor loadings explaining 3.584% of the variability. These are i) Got underage daughter married to combat food insecurity (0.859), and ii) Sell newborn baby for not being able to pay hospital bills (0.826). Hence it can be concluded that Covid 19 affected not only the families but also their offsprings. Factor 6 (Family migration) contains two variables with high factor loadings explaining 3.115% of the variability are i) Had to send family to village (0.80), and ii) Needed to go to hometown as there is no job at capital (0.702). Hence it can be concluded that Covid 19 forced families to migrate to hometown. Factor 7 (Property loss) explaining 2.819% of the variability contains two general family well-being related implications are i) Family became homeless (0.706), and ii) Could not pay shop/house/stall rent for months (0.624). Hence it can be concluded that Covid 19 forced families to lose property.

Factor 8 (Loan/ Income) contains three variables explaining 2.728% of the variability. The variables are i) Needed to take loans from informal sources at high interest (0.735), ii) Household income reduced more among females (0.506) and iii) Tips reduced (0.415). Hence it can be concluded that Covid 19 forced families to take loans with high interest rates, as well as family earnings reduced. Factor 9 (On foot movement) contains two variables: i) Walk to work and other places (0.667), ii) Other income generating activity reduced (0.383). This factor explains 2.529% variability. Hence it can be concluded that Covid-19 forced families to walk to places rather than transport as family earnings reduced.

The rest five factors are less important as they explain very low variability ($\sigma^2 \leq 2.5$). Factor 10 "**Hygiene kits (σ^2=2.371%)"** contains two variables: i) Unable to purchase hygiene kits (0.788), ii) On average, families lose 50% of pre-pandemic income (0.436). Hence it can be concluded that Covid 19 made families unable to purchase hygiene kits as family earnings reduced. Factor 11 "**Meals and starvation (σ^2=2.314%)"** contains two variables: i) Difficult to arrange three meals a day (0.709), ii) Family members need to starve (0.418). Hence it can be concluded that Covid 19 made families unable to arrange meals three times a day as family earnings reduced. Factor 12 "**Dry food intake (σ^2=2.247%)"** contains only one variable with a moderate factor loading: Family members living on dry food (0.599). Hence it can be concluded that Covid 19 forced families to live on dry food (e.g., flat rice, puffed rice).

Factor 13 "**Work burden (σ^2=2.075%)" also** contains only one variable with a very high factor loading. It mainly focuses on work/ job related implications: Work burden increased (0.822). Hence it can be concluded that Covid 19 has increased the workload of the family members. Factor 14 "**Reduced income and loan repayment (σ^2=1.980%%)"** contains two variables with low factor loadings. The variables are i) Income reduced due to lockdown (-0.472) and ii) Failed to repay loan (0.419). Hence it can be concluded that Covid 19 has reduced the income and loan repayment capacity of the family members.

Factor analysis has identified 14 factors as independent variables. Associated with these 14 factors are 51 variables which independently will affect the overall outcome of the research. A regression analysis (both enter and stepwise method) is conducted taking these 14 factors as the independent variable and the **"Covid-19 impacted negatively the financial wellbeing"** as the dependent one. The model is found significant (0.000) with an adjusted r^2 of 33.6%. Eight of the fourteen factors are found significant at 5% level. These are spending/ expenses, hygiene kits, earning shortfall, food intake, property loss, on foot movement, stakeholders standing and offspring destiny.

NOTES

1. A construct is an abstract, theoretical concept or idea (like "intelligence," "happiness," or "brand loyalty") that isn't directly measurable but is crucial for understanding phenomena, requiring researchers to define it operationally through observable variables (like test scores, survey responses).
2. A nuclear family, elementary family or conjugal family is a family group consisting of a man and a woman and their children (one or more). It contrasts with a single-parent family, the larger extended family, or a family with more than two parents.
3. Joint families are composed of sets of siblings, their spouses, and their dependent children.
4. Extended families include at least three generations: grandparents, married offspring, and grandchildren.
5. Factor analysis is a statistical technique that reduces many variables into a smaller set of underlying "factors" or themes to reveal hidden patterns and simplify complex data. Its general purpose is to condense variables, identify common structures, and validate scales, making it easier to interpret results and perform further analysis. It is an interdependence technique in which all variables are simultaneously considered.
6. Varimax rotation is an orthogonal rotation method, meaning it assumes the factors are independent (uncorrelated). Factor analysis with varimax rotation is a statistical technique used to simplify and interpret the results of a factor analysis by rotating the factors to maximize the variance of the squared loadings for each factor. This process makes it easier to interpret the underlying structure of the data by resulting in a "simple structure" where each variable loads strongly on only one factor and has near-zero loadings on the others.
7. A factor is a hidden or underlying variable that is inferred from a set of directly measurable variables. E.g. 'customer purchase satisfaction' as an example, isn't a variable one can directly ask a customer to rate, but it can be determined from the responses to correlated questions like 'did the product meet your expectations?' or 'how would you rate the value for money?' and 'did you find the product easily?' While not directly observable, factors are essential for providing a clearer, more streamlined understanding of data. They enable us to capture the essence of data's complexity, making it simpler and more manageable to work with, and without losing lots of information.
8. An eigenvalue (a measure of a factor's strength) represents the amount of variance explained by a factor. A factor with an eigenvalue of 1 or less is considered to explain less variance than a single original variable, making it redundant to keep.
9. "Total variance explained" in factor analysis shows how much the extracted factors account for the total variance in the data.
10. To name a factor, examination of the relationship between a variable and a factor is needed to identify which variables strongly cluster together. Then, using conceptual understanding of these variables a meaningful name is created that represents the underlying constructs they have in common.
11. Ideally the sample size should be at least 150 (subject to variable ratio greater than 5). The factor analysis of 51 variables with 381 samples is found adequate (KMO test result = 0.881 ≥ 0.5) and valid (Bartlett's test of sphericity indicates a significance level of 0.000). The KMO (Kaiser-Meyer-Olkin) measure of sampling adequacy is a pre-estimation test used to determine if a dataset is suitable for factor analysis. It assesses the proportion of variance among variables that might be common variance.
12. the kaiser criterion is used in factor analysis to determine the number of factors to retain, based on the principle of keeping only factors with eigenvalues greater than one (excellent), aiming for a cumulative percentage that represents the most variance without including too many redundant factors. This method suggests that each retained factor should explain at least as much variance as a single observed variable. Since each original variable contributes one unit of variance, a factor with an eigenvalue >1 explains more variance than a single individual variable.
13. Communality refers to a measure of the percentage of a variable's variation that is explained by the factors. It is the amount of variance an original variable share with all other variables included in the analysis. A relatively higher communality indicates that a variable has much in common with the other variables taken as a group.
14. Factor Loading is a measure of the importance of the variable in measuring each factor. It is used for interpreting and labeling a factor. It is the correlation between the original variables and the factors, and key to understanding the nature of a factor (the strength of the relationship between a variable and a factor).

APPENDICES

Appendix 1: Coordination Schema

Parameter	Complex variables	Simple variables	
Financial implication of COVID-19 on the urban slum dwellers	Work/ Job related implications	Lost my job/ livelihood	Have to shift from a higher-level job to a lower-level job
		Lost my part time job	Work burden increased
		Job insecurity has increased	Other income generating activities reduced
		Not getting enough work	Needed to go to home town as no job available
	Wage/ Salary related implications	Salary has been curtailed	Family/ household income reduced
		No regular income for months	Tips used to get has reduced
		Lost my overtime pay	Household income reduced more among females than males
		Have not received annual increment	On an average, the family lost more than 50% of prepandemic period income
		Have not received festival bonuses	
	Stakeholder related implications	Income reduced since less customers are coming	Income reduced since the number of passengers using rickshaw, motor bike, autorickshaw, taxi decreased
		Income reduced since educational institutions are closed	Income reduced due to lock down by government
		Income reduced since purchasing power of customers decreased	Income reduced as business activities have slowed down
	Savings, expenditure & debt related implications	Cannot save any more	Have to spend more since price of all food items including rice increased
		Spending from my savings	Have to pay extra fare to reach workplace
		Have to spend more as commodity price hiked	Need to take loan from informal sources at high interest rate
		Have to spend more as transportation fare increased	Failed to repay loan
		Expenditure surpassed income	
	Family food related implications	Facing difficulties to arrange three meals a day	Family members are living on dry food only
		Consuming less quantity of food	Sometimes family members need to starve
		Cannot purchase baby food	Could not purchase enough supplies/items
		Consuming reduced amount of protein and healthy food	
	General family well-being related implications	Difficulty in payment of utility and other bills	Family became homeless
		Family members are living without required medical care/ services for not being able to bear healthcare cost	Had to send my family to village
		Not being able to purchase cleanliness/ hygiene kits (mask, sanitizer, soap, etc.)	Needed to sell source of income/ livelihood (rickshaw/ motorbike/ autorickshaw/ van/ photocopy machine, etc.)
		Have to walk to my work & other places instead of using transport	Have to sell my valuables (ornaments, property, etc.) to survive
		Could not pay house/ shop/ stall rent for months	
	Offspring related implications	Had to involve minor family members in odd jobs to tackle economic hardship	Got my underaged girl married off to combat food insecurity
		Decided to sell our newborn baby for not being able to pay hospital bills	
	Overall financial implication	Overall, COVID-19 impacted negatively the financial wellbeing of the family	

Appendix 2: Communalities

Variables	Extraction	Variables	Extraction	Variables	Extraction
Lost job/livelihood	0.668	Less customers are coming	.749	Cannot purchase baby food	0.457
Lost part time job	0.635	Educational institutions are closed	.685	Consuming less protein & healthy diet	0.730
Job insecurity increased	0.591	Purchasing power of customer reduced	.738	Family members living on dry food	0.571
Not getting enough work	0.621	Number of passengers using rickshaw, CNG decreased	.608	Family members need to starve	0.626
Shifted from a higher-level job to lower-level job	0.658	Income reduced due to lockdown	.566	Could not purchase enough supplies/items	0.680
Work burden increased	0.753	Business activities have slowed down	.661	Difficulty in payment of utility and other bills	0.683
Other income generating activity reduced	0.551	Cannot save anymore	.631	Not being able to bear health care cost	0.621
Needed to go to hometown as there is no job at capital	0.760	Spending from my savings	.655	Not being able to purchase hygiene kits	0.724
Salary has been curtailed	0.568	Spend more as commodity price hiked	.678	Walk to work and other places	0.598
No regular income for months	0.631	Spend more as transportation fare increased	.748	Could not pay shop/house/ stall rent for months	0.678
Lost my overtime pay	0.675	Expenditure surpassed income	.727	Family became homeless	0.655
Not received annual increment	0.677	Spend more since price of all food items including rice has increased	.668	Had to send family to village	0.778
Not received festival bonuses	0.580	Pay extra fare to reach workplace	.626	Needed to sell source of income/livelihood	0.639
Family/household income reduced	0.617	Needed to take loans from informal sources at high interest	.668	Have to sell my valuables to survive	0.659
Tips I used to get reduced	0.581	Failed to repay loan	.496	Had to involve minor family members in odd jobs to tackle economic hardship	0.615
Household income reduced more among females than males	0.630	Difficult to arrange three meals a day	.552	Decided to sell our newborn baby for not being able to pay hospital bills	0.751
Family lost 50% of pre-pandemic income on average	0.679	Consuming less quantity of food	.515	My underaged daughter got married off to combat insecurity of food	0.789

Extraction Method: Principal Component Analysis

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