"COVID-19 PANDEMIC AND FOOD INSECURITY: A CASE STUDY OF PAKISTAN"

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ABSTRACT

Food insecurity is becoming one of the most challenging phenomena of recent times. It is considered a global challenge, especially in developing countries. However, after the COVID-19 pandemic, the food insecurity issue raised rapidly. Although the government and other institutes worked exceptionally hard to overcome this problem, the pandemic created a negative impact on it. Food security is directly and positively related to the well-being of individuals. Therefore, the purpose of this study is to emphasize the impact of the COVID-19 pandemic on the food insecurity of Pakistan. To fulfill the objective of this research, the Special Survey for Evaluating Socio-Economic Impact of COVID-19 on Well-being of People is used - conducted by the Pakistan Bureau of Statistics in 2020. The study employs the Ordinary Least Square (OLS) technique for evaluating the objective of this research. The study also constructed a food insecurity index through Principal Component Index. The finding of the study shows a positive and significant impact of wages before COVID-19 on food security whereas; wages during COVID-19 have a negative impact. Employment before and during COVID-19 are statistically significant. Cash assistance during COVID-19 is positive and significant with food insecurity. Based on the finding the study suggested that, although the government of Pakistan Ehsaas Programme working well during the pandemic period it's high time to address current food insecurities issues. The government needs to go beyond merely observing food insecurities to cope with the increasing vulnerability and confront food insecurities..

Keywords: *COVID-19 Pandemic, Food Insecurity, Ehsaas Program, Principal Component Index*

1. INTRODUCTION

Food security means that everyone in the household always has enough food to live an active and healthy life. Food security refers to food that is socially acceptable, appropriate, and safe (Abdullah, et al., 2019; Khan & Shah, 2011). The root causes of food insecurity are sophisticated and multifaceted. They are closely linked to factors such as poverty, lack of access to basic social services, and inadequacy of some public policies (Kansiime, et al., 2021; Abdullah, et al., 2019; Sriram & Tarasuk, 2016). Therefore, food insecurity has recently emerged as a major global concern (Aziz, et al., 2021). Though the latest information on this debate, about 9.9% of the world's population is insecure, and the worst victims of food insecurity and infectious diseases, COVID-19 has made it extremely challenging (FAO, IFAD, UNICEF, WFP, & WHO, 2021). Furthermore, COVID-19's extremely negative economic and social impact turns out to be an exceptionally addressable phenomenon for less developed and developing countries (Pereira & Oliveira, 2020; Mishra & Rampal, 2020). Therefore, these circumstances demonstrate the COVID-19 pandemic's negative impact on global food insecurity, including in Pakistan. (Gillani, et al., 2021).

In Pakistan, one-fourth of the population suffers from food insecurity and is unable to meet their basic daily needs (Shahzad, et al., 2021; Nawaz & Shaheen, 2017; Tanweer, et al., 2015). Quarantine policies in COVID-19 have had a negative and unprecedented impact on Pakistan's already struggling food system, including food access. COVID-19, on the other hand, has a direct impact on individuals' health; however, in addition to adopting COVID-19 policies, responses such as stay-at-home, social restriction, travel, and trade restriction have resulted in a decrease in economic impacts (Shahzad, et al., 2021; Swinnen &McDermott, 2020). Furthermore, food-insecure residents are negatively impacted by the COVID-19 pandemic (Shahzad et al., 2021; FAO, 2020; Nieti, 2020). The closure of economic activities directly harms the ability to purchase food as a result of strict lockdown and stay-at-home policies. Moving further interruptions in the food system resulted in price increases; decreases in wages-income resulted in a loss of purchasing power and exaggerated food insecurity (Shahzad et al., 2021; FAO, 2020; Nieti, 2020; Cardwell & Ghazalian, 2020; Gerard et al., 2020).

As previously stated, the pandemic has a harmful impact on food insecurity, declining purchasing power, price increases, decreased employment status, and wage-income decline. As a result, the goal of this research is to highlight the impact of the COVID-19 pandemic on food insecurity in Pakistan. For this purpose, the study developed Food Insecurity Index through Principal Component Analysis. The study used Special Survey for Evaluating Socio-Economic Impact of COVID-19 on Well-being of People - conducted by the Pakistan Bureau of Statistics (PBS) in 2020 (cross-section analysis) to evaluate the impact of the COVID-19 pandemic on food insecurity in Pakistan. The study employs the Ordinary Least Square (OLS) technique for estimating the model. Besides that, the study evaluates the impact of other social-economic variables: such as Employment Status, Wages, Education (pre-and post-COVID-19), and Adults. The study also incorporates Cash Assistance in the model to evaluate the effect of different cash assistance programs that are successfully working during the time of the COVID-19 pandemic.

There is literature on food security and its determinants in Pakistan (Sultana & Kiani, 2011; Khan et al., 2012; Bashir et al., 2013a; Ali & Khan, 2013; Bashir et al., 2013b), but none of these studies examined the impact of COVID-19 on food insecurity. A couple of studies on the impact of COVID-19 on food insecurity are available. Shahzad et al., (2021) examine the impact of the COVID-19 pandemic on food insecurity and examines the determination of food security, as well as provide strategies in Pakistan's Panjab province. Gillani et al. (2021) examine the impact of the COVID-19 pandemic on food and health insecurity in Punjab's urban informal sector. Ali et al. (2020) investigates the socio-economic impact of the COVID-19 pandemic on Pakistan's rural mountain community. Therefore, this study is thus unique in that it developed a Food Insecurity Index to evaluate the impact of COVID-19 on food insecurity and estimates the overall impact on Pakistan, rather than a specific region or province.

The organization of the remaining paper is as follows: section two provides an overview of previous literature, section three discusses the methodology and data, section four discusses the results of the study, and the last section concluded the paper and through a few policy recommendations for policymakers.

2. Review of literature

There has been little research into the impact of COVID-19 on food insecurity. Previous research has concentrated on policy responses to transportation, trade, logistics, and other challenges. (Faria-e-Castro, 2021; Bhavani & Gopinath, 2020; Shafi & Ren, 2020; Bayer, et al., 2020; Kaplan, et al., 2020). A few studies examined health and economic policies (Eichenbaum, et al., 2021; Alvarez, et al., 2020). Similarly, few studies address the economic consequences of COVID-19 (Baker, et al., 2020; Correia, et al., 2020). Therefore, this section of the study attempts to provide a precise overview of the available literature on the impact of COVID-19 on food insecurity.

(Ahn & Norwood, 2021) proclaims that in the spring of 2020, the COVID-19 pandemic in the United States resulted in massive unemployment, rising food prices, and declining business sales. This led to a decline in household finances and an increase in food insecurity. The study also shows how food insecurity is on the rise as the US government is unable to measure it by December 2020. The study included the Opt-in Panels Internet Survey, which has been rapidly developed in previous research and can estimate government data. In May 2020, the study will look at food insecurity. The results show no significant increase in food insecurity, which was about 3% higher than in 2016 and 2017. (Gundersen, et al., 2021) discuss Feed Americas maps the Meal Gap (MMG) and assesses food insecurity in the United States. The study states that MMG has been in operation for over a decade and provides a sub-state level assessment of food insecurity for both the general population and children. Furthermore, due to the widespread use of food banks, MMGs are often used by state and local governments to assist communities facing food insecurity. As a result, this study explains the MMG Foundation, how it works, and how it ignores the US approach to food providers, as well as how food insecurity in 2020 How to predict features. As a result of the 2018 COVID-19 pandemic. Therefore, by 2020, 17 million more Americans will be facing food insecurity.

(Mishra & Rampal, 2020) deliberately examines the pandemic and proclaims it to be a human challenge as well as a possible cause of food insecurity. First, the study looks at hunger and food insecurity in low- and middle-income nations around the world, as well as in India. India's ranking in the Global Hunger Index (GHI) 2019, India's lockdown condition in COVID-19, and India's present economic situation are also discussed in the study. The study also offers light on the factors that contribute to hunger among Indian mothers and children. Following that, the study explored the impact of COVID-19 on people's lifestyles and appetites, which leads to food insecurity, as well as nutritional status, productivity, education, and pay earnings. More crucially, the researchers addressed a variety of complementary approaches to avoid COVID-19-related deaths, as well as immediate, medium, and long-term measures to prevent deaths from hunger and food insecurity Finally, the study emphasizes the need for the Indian government's timely participation in combined efforts by governmental and non-governmental groups to alleviate hunger and food insecurity, as well as lower COVID-19-related rates. (Pereira & Oliveira, 2020) established the relationship between poverty, food insecurity, and the COVID-19 pandemic. In the fight against the pandemic in more low-income nations, this study presents reliable techniques and social protection tactics. Poverty and food insecurity were examined in the study. According to the study, COVID-19 has been linked to poverty and food insecurity and this is a developing trend. This could be due to a lack of or ineffective political, economic, and social initiatives, job loss and compromise with food production and distribution chains, and a lack of vision for healthy eating in various countries throughout the world. In particular, poor countries are already experiencing social and economic imbalances, and pandemics are putting them in greater danger. Therefore, the study recommends that governmental policies ensuring human rights be devised and implemented for the people to ensure food security in the battle against poverty.

(Wolfson & Leung, 2020) argue that the COVID-19 outbreak has exacerbated food insecurity in the United States. The early effects of pandemics on low-income American adults were ignored in this study due to the use of the social distance metric. A national (web-based) survey was conducted from March 19 to 24, 2020. With a total sample size of 1478 responses, the overall adult response rate was 53%, with a median income of 250 %of the federal poverty level in the United States. This is based on the current state of home food safety as well as the COVID-19 issues. Overall, 36% of food-secure adults in the United States had low incomes, 20% had marginal food security, and 44% were food insecure. Furthermore, 18.8 %of adults with low food safety reported being able to follow public health recommendations for buying food for two weeks at a time. Furthermore, COVID-19's short-term losses were caused by low-income households and food insecurity, which already plagued food insecurity and poverty. To address food insecurity as the pandemic progressed, an immediate and comprehensive policy response was required. Another study by (Niles, et al., 2020) claims that COVID-19 has disrupted food supply and increased food insecurity, resulting in a slew of negative personal and public health consequences. The extensive image capture of COVID-19 influenced the study, which used the facility model to survey population levels across the state. The study chose the first period of statewide home stay orders in Vermont, which runs from March 29 to April 2020. The study assessed food insecurity before and after COVID-19 using a six-item certified

food safety module from the United States Department of Agriculture. The study investigates the prevalence of food insecurity and identifies food access challenges, strategies to address them, and useful interventions, as well as food safety, permanently food insecure individuals (COVID). (Before and after COVID-19) and new insecure households (after COVID-19). According to the study, there has been a 32.3 %increase in household food insecurity among 3219 respondents since COVID-19. The new rate of food insecurity in households was 35%. Respondents who lost their jobs were more likely to experience food insecurity. Furthermore, the study discovered several physical and economic barriers, as well as concerns about food access during COVID-19. Respondents who experienced food insecurity were more likely to have access to and employ counterproductive policies. It also emphasizes that two-thirds of COVID-19 households eat less to meet their daily needs. The study also discovered a significant difference in food insecurity policies among respondents with permanently insecure households. The findings reveal the possible impact of future health-care costs on people's health, including mental health and nutrition. Finally, during COVID-19, the study proposed proactive policies to address food insecurity.

(Schotte, et al., 2021) examines strict COVID-19 lockdown policies affect short- and medium-term employment outcomes. Ghana was selected as the case study for the study. The study takes advantage of Ghana's specific policies, where home stay orders were strictly enforced and there were two locally limited areas. It blocks Ghana's larger metropolitan areas, while the rest of the country adheres to less stringent regulations. Studies of various designs have shown that the three-week lockdown in the treated districts had a significant and immediate negative impact, especially on informal self-employed workers. Another finding suggests that the employment disparity between treated and controlled districts reduced the lockdown after four months. Income and employment have been steadily declining across the country. Lockdowns, particularly severe ones, have harmed the livelihoods of small business owners who primarily operate in the informal economy. Moreover, (Folayan, et al., 2021) examine significant differences in the behavior of people living with and without HIV in Nigeria who use COVID-19 prevention and are food insecure. The researchers used cross-sectional datasets from 4,471 people, 20.5 % of whom were HIV-positive adults. The researchers used binary logistic regression analysis to examine the relationship between descriptive variables, HIV positive and non-positive status, outcome variables - behavior change, physical distance, isolation/quarantine, working from a distance, and food insecurity - hungry but not eaten, cut/skip meals, COVID-19 status, and respondent's medical status. Very few people living with HIV (PLWH) reported significantly positive for COVID-19 and experienced low exercise with COVID-19 risky behavior. Respondent behavior reflects high food insecurity in people who live without HIV, or PLWH, and are hungrier and do not eat, reducing their diet. The relationship between HIV status and COVID-19 prevention and food insecurity is complex and needs to be studied in the future.

(Kansiime, et al., 2021) focuses on COVID-19 infectious diseases' impact on household income and food security To that end, the study chose two East African countries, Kenya and Uganda, to evaluate the study's findings based on data from an

online survey of 442 respondents. According to the findings, the COVID-19 pandemic affects more than two-thirds of respondents, and they are experiencing income shock. Food security and food quality deteriorate when the scale of food insecurity and the frequency of nutritious food intake are compared. As a result, Kenya and Uganda were responsible for 38% and 44% of food insecurity, respectively. When compared to before COVID-19, both countries show a 30% decrease in food consumption during pandemics. In addition, as a result of probate regression, households whose income depends on the income of the poor and laborers are examined. Gets poorer than other types of respondents. Competitive strategies should be based on food. People who have an alternative source of livelihood and rely on savings are more likely than not. Food should be the foundation of competitive strategies. People who have a secondary source of income and rely on savings are more likely to succeed. Farmers were less likely to be food insecure than other respondents who relied on the food market. Participation in national security schemes during COVID-19 results in lower revenue shocks in both countries. Respondents who were members of savings and loan groups reported lower income shocks and lower food consumption. According to the study's findings, the government's current and future policies should focus on structural changes to provide greater social protection, such as developing response packages to reduce poverty in such pandemics. I'm a helper. Furthermore, developing strong financial institutions that will support the business in the medium term, as well as improve and secure the food supply chain, particularly for those facing a nutritious diet.

There is little literature available on COVID-19 impact on food insecurity in the context of Pakistan One study by (Shahzad, et al., 2021) examines COVID-19 and investigates the effects of infectious diseases and food security commitment on food insecurity and offers strategies for the Pakistani province of Punjab. Data was collected online from 370 respondents. Impacts are calculated using the Household Food Security Access Scale (HFIAS) model, and assessors are evaluated using the Logitech Regression model. COVID-19, according to research, increased food insecurity during pandemics and was exacerbated by social and demographic factors. While financial assistance is beneficial to food security. Another study by (Gillani, et al., 2021) examines the effects of food and health insecurity in the urban informal labor market in Punjab Province are assessed. Five administrative divisions of Punjab were chosen at random for this study. Data were gathered from 500 workers in the urban informal sector. The logistic regression model was used to compute the outcomes. According to the findings, infectious diseases harm food and health insecurity. (Ali, et al., 2020) investigates the socioeconomic effects of COVID-19 pandemics in Gilgit-rural Baltistan's hill communities. Snowball sampling techniques were used to collect data for the study. This online survey had 367 respondents. The main issues during the COVID-19 pandemic were low income, financial uncertainty, job loss fear, and food insecurity.

3. Methodology and data discussion

This section of the study discusses the dataset and methodology that is used to estimate the objectives of this research. The study used the Special Survey for Evaluating Socio-Economic Impact of COVID-19 on Well-being of People - conducted by the Pakistan Bureau of Statistics in 2020 (cross-section analysis) for

evaluating the impact of a COVID-19 pandemic on food insecurity in Pakistan. The construction of the study variables is as follows.

- Food insecurity index developed through Principal Component Analysis. The food insecurity index comprises 0, 1, and 2 values, whereas 0 represents those observations that refuse to answer the question or don't know about it. However, 1 is equal to those who faced food insecurity, and food security is assigned 2 for analysis. Section D of the COVID-19 survey questionnaire is based on food insecurity questions. All questions are recoded according to this study and then later on, through Principal Component Analysis, the food insecurity index is developed.
- Employment status before and after COVID-19 is generated to understand the difference between employment status impact on the food insecurity index. Also, these variables are helpful to estimate the separate effect on employment status before and after COVID-19 on food insecurity in Pakistan.
- Wages before and after the COVID-19 pandemic is also generated to find out the separate effect on the food insecurity index.
- Financial assistance is considered as one of the most important components during and after the COVID-19 pandemic. In this survey, Zakat, Benazir Income Support Program (BISP), EOBI, Ehsaas program, NGOs, Other assistance, and private person assistance (friends and family) are included. To combine all of the above-mentioned cash assistance categories into a single variable called Cash Assistance.
- Education is the maximum education attained (formal education) by the individuals.

Moving toward the estimation technique and study model through which research objectives are tested. The study employs the Ordinary Least Square (OLS) technique for estimating the effect of a COVID-19 pandemic on food insecurity in Pakistan. The study model is,

$$FD = \beta 0 + \beta 1\ ESB + \beta 2\ ESA + \beta 3\ WB + \beta 4\ WA + \beta 5\ Edu + \beta 6\ Log\ (CA) + \beta 7\ Ad + €$$

Whereas FD is the food insecurity index generated through the Principal Component Analysis, ESB is employment status before COVID-19, ESA employment status after COVID-19, WB wages before COVID-19, WA wages after COVID-19, Edu is the education, CA is the Cash Assistance in a log form, Ad is the Adult, and € is the error term.

Result Discussion

This section of the study is divided into parts, the first part presents the descriptive analysis that is extracted from the study data and the second part discusses the Ordinary Least Square regression analysis that is shown in table 4. Moving toward the first part of this study is descriptive analysis Tables 1, 2, and 3 present the descriptive analysis of province, region, and province and region wise variation analysis on food

insecurity index. There is a mixed trend observed from province wise variation, like KPK and Punjab shows the positive effect on the food insecurity index. Whereas Sindh and Balochistan show a negative impact on the food insecurity index. The highest food insecurity is measured in Sindh province. Whereas the regional-wise variation is concerned both rural and urban regions are showing a negative impact on the food insecurity index. Rural areas of the country show higher food insecurity as compared to urban areas. Province and region wise variation analysis show that KPK and Punjab are having a positive impact on the food insecurity index in both regions. Whereas Sindh and Balochistan show a negative impact on the food insecurity index in rural and urban regions. In rural areas of the country food insecurity is higher than in the urban areas of the country.

Tables 1: Province wise variation of Food Insecurity Index

Province	Mean
KPK	0.09690761
Punjab	0.06712872
Sindh	-0.26065406
Balochistan	-0.02902684

Tables 2: Region wise variation of Food Insecurity Index

Region	Mean
Rural	-0.05293
Urban	-0.04082

Tables 3: Province and Region wise variation of Food Insecurity Index

Povince	Region	
	Rural	Urban
KPK	0.155306	0.068555
Punjab	0.078624	0.061916
Sindh	-0.30266	-0.24095
Balochistan	-0.09476	-0.00291

The probability of F-statistics shows that the model is highly significant, this indicates that all variables are having an impact on the Food Insecurity index. Furthermore, 970 observations are included in this study.

Employment status before COVID-19 is highly significant, on an average, a one-point increase in employment status before COVID-19 leads to an increase in food security by 0.083 points. Food insecurity index developed with 0, 1, and 2 that is refused to answer the question or don't know equal 0, faced food insecurity equal 1, and food security is 2. During the COVID-19 pandemic in Pakistan, individuals and families suffered because of the shortage of money and food at home. Before the COVID-19 pandemic, the food security situation is much better as compared to the after COVID-19.

The employment status after COVID-19 showed a negative effect on the food insecurity index. This indicates that because of the reduction in employment status after the COVID-19 pandemic in Pakistan, food insecurity is increasing. That is, on an average one-point decrease in employment status (after COVID-19) lead to an increase the food insecurity by 0.095 points. Due to the COVID-19 pandemic, the labor market was affected very badly, and job reduction is observed during and after a COVID-19 pandemic.

Furthermore, another variable that is, wages before the COVID-19 pandemic in Pakistan. This variable is statistically significant and positively related to the food insecurity index. This shows that, on an average, an on-point increase in wages leads to the 0.0000028 points increase in the food insecurity index. Food security increases

because of the wage increase. When a family is earning a good amount, they will spend more on food, because it is the requirement of life. Whereas wages after COVID-19 show a negative impact on the food insecurity index. This indicates that when one-point increase is observed in wage after COVID-19 there is a decrease in food security by 0.0000025 points.

Table 4: Regression Analysis

Food Insecurity Index	**Coef.**	**Std. Err.**	**t**	**P>t**
Employment Status	0.0839970	0.0195053	4.31000	0.0000
Emp Status After	-0.0959007	0.0185537	-5.17000	0.0000
Wages before COVID-19	0.0000028	1.45E-06	1.96000	0.0510
Wages COVID-19	-0.0000025	2.31E-06	-1.10000	0.2740
Education	0.0187152	0.009452	1.98000	0.0480
Log Cash Assistance	-0.0247517	0.0062685	-3.95000	0.0000
Adult	0.0019157	0.0020086	0.95000	0.3400
Province				
Punjab	-0.1992247	0.0827861	-2.41000	0.0160
Sindh	-0.3970490	0.0857549	-4.63000	0.0000
Balochistan	-0.5158830	0.1015647	-5.08000	0.0000
Region				
Urban	0.0977396	0.0657813	1.49000	0.1380
_cons	0.2527755	0.1204468	2.10000	0.0360
F (11, 958)	13.46		No. of obs	970
Prob > F	0.0000			
R-squared	0.1338		Adj R-squared	0.1239
Source	SS		df	MS
Model	116.94537		11	10.6313973
Residual	756.7624		958	0.789939879
Total	873.70777		969	0.90165921

Source: *Author's estimation*

Moving further, Cash assistance includes Zakat, Benazir Income Support Program (BISP), Ehsaas Program, EOBI, NGOs, Other Assistance, and Private Person cash assistance that includes friends and family. This variable shows a negative but significant impact on the food insecurity index. The negative sign indicates that when a family needs cash assistance from any of the above-mentioned source then it is obvious that the family need some financial help. So, food insecurity in these families is very high. It is observable that, a one-point increase in cash assistance leads to a decrease in the food insecurity index by 0.0247517 points.

As far as regional and provincial level variation is concerned, the KPK province and Rural region counted as a reference category. The result shows that all three provinces of Pakistan (Punjab, Sindh, and Balochistan) are statistically significant but

Table 5: Variance Inflation Factor (VIF)

Variable	VIF	1/VIF
Employment status	2.96	0.337732
Employment status after COVID-19	2.83	0.353163
Wages before COVID-19	2.55	0.392173
Wages after COVID-19	2.47	0.404735
Education	1.26	0.791218
Log of Cash Assistance	1.06	0.943661
Adult	1.04	0.964772

Source: *Author's estimation*

Moving toward the heteroskedasticity analysis, the Breusch Pagan test is used to detect heteroskedasticity from the model. After using a test, the chi-square probability value is significant, this shows the presence of heteroskedasticity in the model. For removing heteroskedasticity, a robust test is used. Table 6 present the results of OLS after removing the heteroskedasticity from the model.

Table 6: Removal of Heteroskedasticity

Food Insecurity Index	Coef.	Robust Std. Error	t	P>t
Employment status	0.083997	0.0280105	3.0000	0.0030
Employment status after	-0.0959007	0.0281167	-3.4100	0.0010
COVID-19				
Wages before COVID-19	0.00000284	1.22E-06	2.3300	0.0200
Wages after COVID-19	-0.00000253	2.13E-06	-1.1900	0.2340
Education	0.0187152	0.0093168	2.0100	0.0450
Log Cash Assistance	-0.0247517	0.0065217	-3.8000	0.0000
Adult	0.0019157	0.0018428	1.0400	0.2990
Province				
Punjab	-0.1992247	0.0657126	-3.0300	0.0020
Sindh	-0.397049	0.0744378	-5.3300	0.0000
Balochistan	-0.515883	0.0849519	-6.0700	0.0000
Region				
Urban	0.0977396	0.0692659	1.4100	0.1590
_cons	0.2527755	0.1048082	2.4100	0.0160

Source: *Author's estimation*

After using a robust test, no difference finds out related to the relationship of independent variables to the dependent variable. Employment status shows a positive and significant result whereas employment status after COVID-19 showed a negative but significant relationship with the food insecurity index. Wages before COVID-19 are positive and significantly related to the food insecurity index, Wages after COVID-19 show a negative relationship. Same as for Cash assistance, it shows the negative and significant relationship with the food insecurity index. Whereas education and adult are positively related to food insecurity. As far as provincial

variation is concerned, all three province shows a negative but significant relationship with the food insecurity index. Whereas urban region is positive and insignificant.

5. Conclusion and Policy Recommendations

Food insecurity has emerged as one of the world's most pressing issues. This was exacerbated by the COVID-19 pandemic. Approximately 9.9 % of the world's population is vulnerable, and prey food insecurity and pandemics have made matters even more difficult. The pandemic has a negative impact on food insecurity, purchasing power, unemployment status, and wage - income. To keep in mind these facts, this study is to emphasize the impact COVID-19 pandemic on food insecurity in Pakistan. Therefore, the study developed Food Insecurity Index through Principal Component Analysis. The study used Special Survey for Evaluating Socio-Economic Impact of COVID-19 on Well-being of People - conducted by the Pakistan Bureau of Statistics (PBS) in 2020 (cross-section analysis) to evaluate the impact of the COVID-19 pandemic on food insecurity in Pakistan. For estimation of the model, the study employs the Ordinary Least Square (OLS) technique. Besides that, the study evaluates the impact of other social-economic variables: such as Employment Status, Wages, Education (pre-and post-COVID-19), Cash Assistance, and Adults.

The overall impact of the model is significant all the independent variables show an impact on the dependent variable. The study used 970 observations, and the Food insecurity index was created with 0, 1, and 2 that refused to answer the question or didn't know equaled 0, faced food insecurity equaled 1, and food security equaled 2. Furthermore, employment status before COVID-19 is extremely important. Households suffer during the COVID-19 pandemic due to a lack of income and food access. As a result, employment status after COVID-19 had a negative effect on the food insecurity index. Concerning other variables, wages are statistically significant and positively related to the food insecurity index before the COVID-19 pandemic and food security improves. However, wages after COVID-19, on the other hand, have a negative impact on the food insecurity index and distort food insecurity. Furthermore, KPK considers all other provinces (Punjab, Sindh, and Balochistan) as reference categories because they are statistically significant but negatively related to the food insecurity index. The urban area has a positive but insignificant outcome. Based on empirical estimates, the study concludes that the COVID-19 pandemic distorted Pakistan's already troubled food system and had negative economic consequences.

Finally, the study emphasizes the significance of the Pakistan government's appropriate interventions: The government needs to go beyond merely observing food insecurities to cope with the increasing vulnerability and confront food insecurities. A joint effort policy should be implemented with governmental and non-governmental organizations to reduce hunger and food insecurity while also lowering COVID-19-related rates. The government's current and future policies should focus on structural changes to provide more social security, such as developing responsive packages to help reduce poverty in such pandemics. The government should establish strong financial institutions to support businesses in the medium term, as well as to improve and secure the food supply chain, particularly for those who face nutrient-dense food. Human rights guaranteeing public policies developed to ensure adequate food must be improved and implemented for the population in poverty contexts with the goal of food security.

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