



## Research Article

# Rural women's knowledge and practices about food safety during the COVID-19 pandemic in El-Beheira and Alexandria Governorates in Egypt

Rasha Mohamed Mahmoud Assy\*, Mai Ahmed Rafaat El Tatawy

*Agricultural Extension and Rural Development Research Institute, Agricultural Research Center, Egypt.*

\*Correspondence: [rasha.assy@yahoo.com](mailto:rasha.assy@yahoo.com)

## Article History

Received: July 18, 2025

Accepted: October 04, 2025

Published: October 20, 2025

## Abstract

The primary purpose of this study is to determine the level of knowledge and practices of Rural women regarding food safety during the COVID-19 pandemic in Egypt. Data were collected from 183 respondents using a questionnaire administered in person while taking the necessary precautionary measures. The level of respondents' knowledge and practices in food safety was determined by assessing their knowledge and practices in food purchase, preservation, storage, preparation, and cooking. The results showed that the majority of respondents had moderate and low levels of knowledge (74.3% and 9.3%, respectively) and practice (59.6% and 27.8%, respectively) regarding food safety during the COVID-19 pandemic. Furthermore, significant correlations at 0.05 and 0.01 were found between respondents' degree of knowledge about food safety during COVID-19 and their educational level and the number of household appliances owned by their family, respectively. As well as a significant correlation at 0.01 between respondents' degree of practice of food safety during COVID-19 and respondents' age, number of years of marriage, number of family members, and the number of household appliances owned by the respondent's family.

**Keywords:** Food safety, food processing, knowledge, pandemic, COVID-19

## Introduction

The World Health Organization described COVID-19 as a pandemic, as the virus affected all members of society and all productive sectors, including agriculture (Ma et al., 2021). COVID-19 has also exacerbated pre-existing weaknesses in the agricultural industry in Egypt (United Nations, 2020). In addition, it affected lifestyle and social habits, such as cooking habits, in Egypt during lockdown (Abdelkawy, 2023). Since developed countries have adopted healthy food, the general focus on food security has shifted to food safety (Butu et al., 2020). Foodborne diseases are a significant global problem, so food safety has become a global health goal (El Sakhy et al., 2020). One of the most critical public health issues is controlling and preventing foodborne illness through food safety practices (Dagne et al., 2019). The COVID-19 pandemic has significantly impacted food safety practices and consumer behavior. Although there is no evidence of transmission through food (Farah et al., 2025). However, when considering the possibility of an epidemic and, consequently, establishing prevention measures, attention should be paid to this possibility (Duda-Chodak et al., 2020).



Copyright: © 2025 by the authors.  
Licensee Roots Press, Islamabad  
Pakistan.

This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Studies have indicated that if you freeze food without cleaning it, the Coronavirus can remain alive for 2 years, and the virus dies during the cooking process (BfR, 2020). Food may become contaminated directly by the unsanitized hands of those who prepare and serve food (Cook, 2013). Therefore, it was found that among the factors that play a fundamental role in food are attitudes, knowledge, and practices related to food safety (Shabrina, 2021). In such cases, women play a significant role in preparing, storing, and providing healthy food (Abedi-Sarvestani and Avarand, 2020).

### Research aims

- Determining the level of knowledge of rural women about food safety during the COVID-19 pandemic in the research area.
- Determining the level of rural women's practice of food safety during the COVID-19 pandemic in the research area.
- Determining the most important sources of information related to food safety in the research area.
- Determining the relationship between the degree of respondents' knowledge and practices about food safety during the COVID-19 pandemic as a dependent variable and the following independent variables: Age, Number of years of marriage, Number of family members, educational level of respondents, and the number of household appliances owned by the respondent's family.
- Identifying the obstacles that rural women face in achieving food safety.

### Theoretical framework

COVID-19 was sudden, and citizens around the world were caught unprepared (Badejo et al., 2020). The impact of COVID-19 has been profound on food security and safety. Because food is a basic human need and contaminated food is the cause of many outbreaks, a set of health recommendations for populations and industries has been identified (Nguyen et al., 2021). Since most foodborne illnesses are related to the home environment, the role of women is crucial in preparing and storing healthy food (Abedi-Sarvestani and Avarand, 2020).

Some methods that rural women can use to protect food from the COVID-19 virus. The COVID-19 virus is active at a temperature of  $-20^{\circ}\text{C}$  or lower for two years. Storing food in the refrigerator at a temperature ( $4-8^{\circ}\text{C}$ ) does not make this virus inactive; COVID-19 can be inactivated at a high temperature ( $70^{\circ}\text{C}$ ) (Hirneisen, 2010). So, fruits and vegetables should be washed well with water, disinfected, and then moved to the refrigerator. Market-bought, washable packages are washed at home with water and disinfectants (Bertrand et al., 2012). A woman should clean and sanitize surfaces such as refrigerator handles and cooking boards (Unhale et al., 2020). Also, they should not sneeze or cough when preparing food, and raw and partially cooked foods should be avoided (Shariatifar and Molae-aghahae, 2019). Some studies associated with food safety and COVID -19 have emerged, such as: Olaimat et al. (2020), Ranaei et al. (2020), Lacombe et al. (2020), and Limon (2021) which included food safety practices of food prepared and cooked at home to online selling during COVID-19, Food safety during and after covid-19 Pandemic, Food Safety Practices during COVID-19 Pandemic and also discussed lessons learned from outbreaks and pathogen analysis from a food safety perspective. Kamgain et al. (2022) also

showed that awareness of the pandemic led to a preference for cooked foods and greater attention to hygiene during food preparation. In addition, Al-Jaberi et al. (2023) found that women who handle food in their homes had insufficient knowledge, negative attitudes, and incorrect practices concerning food safety. As well as Osaili et al. (2021), the study showed that university students in Jordan had insufficient overall food safety knowledge, attitudes, and practices during the COVID-19 pandemic. Moreover, another survey in Kuwait by AlTarrah et al. (2021) reported that There has been a change in food purchasing behaviors, eating behaviors, food consumption, and the overall perception of food safety during the COVID-19 pandemic.

## Methods

This research uses primary data from 183 rural women, wives of holders, in the governorates of Beheira and Alexandria. Data were collected from a random sample of 5% of the total rural women wives of holders during April and May 2022. The study used a pretested questionnaire administered to 20 women to ensure all questions were precise and understandable, in Alwafaia and Abo wafia Villages from Eldalnagate district of Beheira governorate, and in Al-Mansheya Al-Bahariah Association and Elnomozagia village Association from Al-Mamoura district of Alexandria Governorate. The questionnaire was used to collect data from respondents through personal interviews, taking precautionary measures due to covid-19. It was designed to achieve the research objectives. It included 4 sections: The first consisted of questions related to respondents' socio-demographic characteristics (age, Educational level, Number of years of marriage, Number of family members, Functional status, and number of household appliances owned by the respondents' family). The second section included 21 questions related to (food purchase, preserving and storing food, and preparing and cooking food) to assess the level of knowledge and practices of the respondents of food safety during Covid-19. All questions were multiple-choice and based on a Likert scale. The third section contained questions about the most important sources of information respondents used for food safety in the research area. The last section included questions on identifying the obstacles rural women face in achieving food safety.

## Data analysis

Descriptive statistics were used for the analysis. According to Hejase and Hejase (2013), descriptive statistics use frequency and percentages depicted in tables for simplicity. In addition this study used Pearson's simple correlation coefficients to determine the relationship between level degree of knowledge and practices of the respondents on food safety during COVID -19 pandemic, as a dependent variable and the Socio demographic variables including the age of respondents, number of years of marriage, number of family members, and the number of household appliances owned by the respondents family as independent variables. The Chi-square test of independence was also used to compare the differences in the levels of knowledge and practices of rural women regarding food safety during COVID-19 according to functional status. The statistical analysis was conducted using IBM SPSS Statistics (Hejase and Hejase 2013).

## Results and discussion

### Distribution of rural women according to their level of knowledge and practices about food safety during COVID- 19 pandemic

Table 1 summarizes the distribution of rural women by their level of knowledge and practices regarding food safety during the COVID-19 pandemic. Results show that the majority of respondents had average and low levels of knowledge (74.3%) and (9.3%), respectively, and their level of practices (59.6%) and (27.8%), respectively, about food safety during COVID -19 pandemic. These results agree with the studies by Moreb et al. (2017), indicating that (67.0%) of the population of Ireland had a moderate level of knowledge about food safety practices. Another study in Dubai by Osaili et al. (2022), reported that (53%) of women had practical knowledge about food safety. The current research results are consistent with the Dange et al. (2019) study, which found that (49.6%) of respondents had a good level of food safety practices. This may be due to the shortage of food safety training courses. Table 2 shows the distribution of rural women according to their level of knowledge and practices regarding food safety. (63.4%) of respondents had an average level of knowledge related to food purchase, and (57.4%) had an average level of practice related to food purchase. More than half of the respondents (59.6%) had an average level of knowledge related to preserving and storing food, compared to 78.2% who had an average level of practice. This may be due to the lack of household appliances that help protect and store food. (4.9%) of respondents had a low level of knowledge related to preparing and cooking food, compared to (59%) who had a low level of practice in preparing and cooking food. This is probably due to habits respondents acquired from their parents. These results concur with those of Saeed et al. (2021), who found that 67.5% knew about food purchasing. These results were also in line with a survey by Ayaz et al. (2018), reporting that (64.9%) of participants had moderate knowledge of food storage. Another study in Saudi Arabia by Farahat et al. (2015), found that practices among Saudi women (60.2%) are lower than their knowledge about cooking.

Table 1. Distribution of respondents among rural women according to their level of knowledge and practices regarding food safety during the COVID-19 pandemic.

level of knowledge	Respondents		Level of practices	Respondents	
	No	%		No	%
low less than 44	17	9.3	low less than 54	51	27.8
Average (44 – 53)	136	74.3	Average (54 – 66)	109	59.6
High (more than 53)	30	16.4	High (more than 66)	23	12.6
Total	183	100	Total	183	100

### Sources of information related to food safety

Table 3 presents the sources of information related to food safety. Results show that the most important source to which the respondents are exposed is television (44.3%). The doctor is the least source of information that the respondents are exposed to (7.6%). The results also show that television comes first in the degree to which respondents benefit from it as a source of information related to food safety (37.7%), followed by family (25.1%), and comes as the last source, the rural women leaders and the doctor (10.9%) and (9.3%) respectively. This may be due to the lack of rural women leaders, and the

respondents were not interested in asking doctors about food safety. The results, consistent with Lemos et al. (2023), found that television is the primary source of information on food safety in Portugal during COVID-19.

Table 2. Distribution of respondents' rural women according to their level of knowledge and practices about food safety during the COVID-19 pandemic.

Knowledge	A: The level of knowledge of respondents' rural women related to food purchase		
	categories of knowledge	No	%
	Low (Less than 12)	10	5.4
	Average (12 – 15)	116	63.4
	High (more than 15)	57	31.2
	Total	183	100
	B: The level of knowledge of respondents' rural women related to preserving and storing food		
	Low (less than 8)	19	10.4
	Average (8 – 11)	109	59.6
	High (more than 11)	55	30
	Total	183	100
	C: The level of knowledge of respondents' rural women in preparing and cooking food		
	Low (less than 21)	9	4.9
	Average (21 – 25)	112	61.2
	High (more than 25)	62	33.9
Total	183	100	
Practices	A: The level of practice of respondents' rural women related to food purchase		
	categories of practice	No	%
	Low (less than 16)	74	40.4
	Average (16 – 23)	105	57.4
	High (more than 23)	4	2.2
	Total	183	100
	B: The level of practice of respondents' rural women related to preserving and storing food		
	Low (less than 10)	16	8.7
	Average (10 – 15)	143	78.2
	High (more than 15)	24	13.3
	Total	183	100
	C: The level of practice of respondents' rural women in preparing and cooking food		
	Low (less than 30)	108	59
	Average (30 – 37)	63	34.4
	High (more than 34)	12	6.6
Total	183	100	

**Differences in the levels of knowledge and practice among rural women regarding food safety during COVID-19, by functional status as an independent variable.**

Table 4 shows that there were statistically significant differences among respondents in their levels of knowledge (9.043) and practices (8.982) about food safety during COVID-19, with functional status as the independent variable at the 0.05 significance level.

Table 3. Arrange the sources of information related to food safety in descending order according to their relative importance to the respondents and the extent to which they benefit from it.

Sources of information	The level of exposure to information sources								The level of benefit of information sources							
	Always		Sometimes		Rarely		Never		High		Moderate		Low		do not benefit	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Television	81	44.3	62	33.9	5	2.7	35	19.1	69	37.7	70	38.2	8	4.4	36	19.7
Family	52	28.4	90	49.2	13	7.1	28	15.3	46	25.1	100	54.6	9	5	28	15.3
Personal experience	47	25.7	91	49.7	19	10.4	26	14.2	40	21.9	101	55.2	16	8.7	26	14.2
Neighbors and friends	36	19.7	82	44.8	15	8.2	50	27.3	31	17	87	47.5	13	7.1	52	28.4
Internet	24	13.1	88	48.1	5	2.7	66	36.1	25	13.7	87	47.5	8	4.4	63	34.4
Rural women leaders	15	8.2	72	39.3	24	13.1	72	39.3	20	10.9	58	31.7	30	16.4	75	41
The doctor	14	7.6	84	45.9	10	5.5	75	41	17	9.3	77	42.1	13	7.1	76	41.5

Table 4. Differences in the levels of knowledge and practice among rural women regarding food safety.

Variables	Chi-square	
	Knowledge	Practices
functional status	9.043	8.982

Degree of freedom= 2

#### **Correlation relationship between some independent variables and the level of knowledge and practices of rural women about food safety during COVID -19**

Table 5 shows that there is significant correlation relationship at 0.01 between respondents' degree of practices about food safety during COVID -19 and age of respondents, number of years of marriage, number of family members and the number of household appliances owned by the respondent's family, where the values of the simple correlation coefficient were 0.277, 0.268, 0.401, and 0.300 respectively. There is also a significant correlation at 0.05 and 0.01 between respondents' degree of knowledge about food safety during COVID-19 and their educational level and the number of household appliances owned by their family, respectively. Where the values were 0.190 and 0.427, respectively. Results supported by Abdelwahed et al. (2022) found a statistically significant relationship between food safety knowledge and practices and the level of education of food handlers. Also, results are consistent with those of Al-Jaberi et al. (2023), who found a relationship between participants' total food safety knowledge, attitudes, and practices scores and education and age.

#### **The obstacles that rural women face in achieving food safety**

Table 6 presents five obstacles faced by rural women in achieving food safety during COVID-19, arranged in descending order by percentage. High food prices is (92.3%), followed by (89.6%) high prices of disinfectants and sterilizers, the lack of training

courses in the field of food safety (57.9%), the unavailability of a reliable source of food safety information (48.6%), and the unavailability of some foods in the market due to the COVID -19 pandemic (33.9%).

Table 5. Correlation coefficient values between independent variables and the level of knowledge and practices of rural women about food safety during COVID-19.

Variables	Correlation coefficient values	
	Knowledge	Practices
Age of respondents	.064-	0.277**
Number of years of marriage	-.041	.268**
Number of family members	-.130	.401**
Educational level of respondents	.190*	102
The number of household appliances owned by the respondent's family	.427**	.300**

\*\*Statistically significant relationship at level 0.01

\*Statistically significant relationship at level 0.05

Table 6. The obstacles that rural women face in achieving food safety.

Obstacles	Frequency	%
High food prices due to COVID -19	169	92.3
High prices of disinfectants and sterilizers due to COVID - 19	164	89.6
Lack of training courses in the field of food safety	106	57.9
Unavailability of a reliable source of food safety information	89	48.6
Unavailability of some foods in the market due to the COVID - 19 pandemic	62	33.9

## Conclusions

Overall, respondents had moderate knowledge and practices regarding food safety during the COVID-19 pandemic. Therefore, it is recommended to conduct training courses to help rural women acquire expertise and practices in food safety to maintain their families' health during a pandemic such as COVID-19. In addition, the study showed that the most important source of information respondents receive about food safety is television. Therefore, the study recommends that the Ministry of Agriculture, the Food Safety Authority, and the media develop programs to educate rural women on food safety knowledge and practices.

## Study limitation

Due to differences in educational level among rural women and the high percentage of illiteracy, data were collected using a questionnaire administered in person, while taking necessary precautionary measures.

## References

Abdelkawy, K., Elbarbry, F., El-masry, S. M., Zakaria, A. Y., Rodríguez-Pérez, C., & El-khodary, N. M. (2023). Changes in dietary habits during the Covid-19 lockdown in Egypt: the Egyptian COVIDiet study. *BMC Public Health*, 23, 956.

- Abdelwahed, A. Y., Metwaly, S. M., Ahmed, A. K., Gazar, Z., & Alagamy, A. (2022). Knowledge, attitudes and practices of food handlers about food safety at Fayoum restaurants. *Tanta Scientific Nursing Journal*, 24(1), 357–379.
- Abedi-Sarvestani, A., & Avarand, A. (2020). Food safety knowledge and practice and its relationship with literacy: The case of rural women in Iran. *Social Determinants of Health*, 6(1).
- Al-Jaberi, T. M., Al-Nabulsi, A. A., Olaimat, A. N., & Mutlaq, S. (2023). Food safety knowledge, attitudes, and practices among Jordanian women handling food at home during COVID-19 pandemic. *PLOS ONE*, 18(7), Article e0288323.
- AlTarrah, D., AlShami, E., AlHamad, N., AlBeshar, F., & Devarajan, S. (2021). The impact of Coronavirus COVID-19 pandemic on food purchasing, eating behavior, and perception of food safety in Kuwait. *Sustainability*, 13(16), 8987.
- Ayaz, W. O., Priyadarshini, A., & Jaiswal, A. K. (2018). Food safety knowledge and practices among Saudi mothers. *Foods*, 7(12), 193.
- Badejo, B., Olasunkanmi, O. G., & Nathaniel, O. O. (2020). Rural women and the COVID-19 pandemic in Ogun State, Nigeria: An empirical study. *African Journal of Governance and Development*, 9(2), 382–404.
- Bertrand, I., Schijven, J. F., Sanchez, G., Wyn-Jones, P., Ottoson, J., Morin, T., Muscillo, M., Verani, M., Nasser, A., de Roda Husman, A. M., Myrmet, M., Sellwood, J., Cook, N., & Gantzer, C. (2012). The impact of temperature on the inactivation of enteric viruses in food and water: A review. *Journal of Applied Microbiology*, 112(6), 1059–1074.
- BfR (German Federal Institute for Risk Assessment). (2020, May 13). *Can the new type of coronavirus be transmitted via food and objects?* [https://www.bfr.bund.de/en/can\\_sars\\_cov\\_2\\_be\\_transmitted\\_via\\_food\\_and\\_objects\\_-244090.html](https://www.bfr.bund.de/en/can_sars_cov_2_be_transmitted_via_food_and_objects_-244090.html)
- Butu, A., Bruma, I. S., Tanasa, L., Rodino, S., Vasiliu, C. D., Dobos, S., & Butu, M. (2020). The impact of COVID-19 crisis upon the consumer buying behavior of fresh vegetables directly from local producers. Case study: The quarantined area of Suceava County, Romania. *International Journal of Environmental Research and Public Health*, 17(15), 5485.
- Cook, N. (Ed.). (2013). *Viruses in food and water: Risks, surveillance and control*. Woodhead Publishing.
- Dagne, H., Raju, R. P., Andualem, Z., Hagos, T., & Addis, K. (2019). Food safety practice and its associated factors among mothers in Debarq Town, Northwest Ethiopia: Community-based cross-sectional study. *BioMed Research International*, 2019, Article 1549131.
- Duda-Chodak, A., Lukasiewicz, M., Zięć, G., Florkiewicz, A., & Filipiak-Florkiewicz, A. (2020). Covid-19 pandemic and food: Present knowledge, risks, consumers fears and safety. *Trends in Food Science & Technology*, 105, 145–160.
- El Sakhy, N. M., Mohamed, N. Y., & El Sherbini, H. H. (2020). Food safety knowledge, practices and attitudes of community dwelling older adults in Marsa Matrouh City, Egypt. *International Journal of Novel Research in Healthcare and Nursing*, 7(2), 366–383.

- Farahat, M. F., El-Shafie, M. M., & Waly, M. I. (2015). Food safety knowledge and practices among Saudi women. *Food Control*, *47*, 427–435.
- Farah, A. M., N., Yousuf, T., Roble, A. K., Obsiye, M., Aden, M. A., Abdi, A. S., & Getnet, F. (2025). Food handling practices among food businesses in Jigjiga, Eastern Ethiopia, during the COVID-19 pandemic: Cross sectional study. *JMIR Formative Research*, *9*, Article e64214.
- Hejase, A. J., & Hejase, H. J. (2013). *Research methods: A practical approach for business students* (2nd ed.). Masadir Inc.
- Hirneisen, K. A., Black, E. P., Cascarino, J. L., Fino, V. R., Hoover, D. G., & Kniel, K. E. (2010). Viral inactivation in foods: A review of traditional and novel food-processing technologies. *Comprehensive Reviews in Food Science and Food Safety*, *9*(1), 3–20.
- Kamgain, A. D. T., Kesaa, H., & Onyenweaku, E. O. (2022). Food safety behavioural changes among the population in Sub-Saharan Africa during the Covid-19 first wave. *Heliyon*, *8*(6), Article e09623. <https://doi.org/10.1016/j.heliyon.2022.e09623>
- Lacombe, A., Quintela, I., Liao, Y., & Wu, V. C. H. (2020). Food safety lessons learned from the COVID-19 pandemic. *Journal of Food Safety*, *41*(2), Article e12878.
- Lemos, M., Maia, R. L., & Teixeira, P. (2023). Access to information, and concerns, myths and truths about food safety during the COVID-19 pandemic: An overview of the Portuguese population. *Foods*, *12*(15), 2802.
- Limon, M. R. (2021). Food safety practices of food handlers at home engaged in online food businesses during covid-19 pandemic in the Philippines. *Current Research in Food Science*, *4*, 63–73.
- Ma, N. L., Peng, W., Soon, C. F., Hassim, M. F. N., Misbahb, S., Rahmat, Z., Yong, W. T. L., & Sonne, C. (2021). Covid-19 pandemic in the lens of food safety and security. *Environmental Research*, *193*, Article 110405.
- Moreb, N. A., Priyadarshini, A., & Jaiswal, A. K. (2017). Knowledge of food safety and food handling practices amongst food handlers in the Republic of Ireland. *Food Control*, *80*, 341–349.
- Nguyen, T. H. T., Le, H. T., Le, T., Do, T. T. T., Ngo, T. V., Phan, H. T., Vu, G. T., Nguyen, T. H., Phung, D. T., Nguyen, S. H., Vu, T. M. T., Tran, T. T., Truong, D. V., Le, T. T., Tran, B. X., Latkin, C. A., Ho, R. C. M., & Ho, C. S. H. (2021). Interdisciplinary assessment of hygiene practices in multiple locations: Implications for COVID-19 pandemic preparedness in Vietnam. *Frontiers in Public Health*, *8*, Article 589183.
- Olaimat, A. N., Shahbaz, H. M., Fatima, N., Munir, S., & Holley, R. A. (2020). Food safety during and after the era of covid-19 pandemic. *Frontiers in Microbiology*, *11*, Article 1854.
- Osaili, T. M., Al-Nabulsi, A. A., & Taybeh, A. O. (2021). Food safety knowledge, attitudes, and practices among Jordan Universities students during the COVID-19 pandemic. *Frontiers in Public Health*, *9*, Article 729816.
- Osaili, T. M., Saeed, B. Q., Taha, S., Adrees, A. O., & Hasan, F. (2022). Knowledge, practices, and risk perception associated with foodborne illnesses among females living in Dubai, United Arab Emirates. *Foods*, *11*(3), 290.

- Ranaei, V., Pilevar, Z., & Hosseini, H. (2020). Food safety practices in COVID-19 pandemic. *Journal of Food Quality and Hazards Control*, 7(3), 116–118.
- Saeed, B. Q., Osaili, T. M., & Taha, S. (2021). Foodborne diseases risk factors associated with food safety knowledge and practices of women in Sharjah-United Arab Emirate. *Food Control*, 125, Article 108024.
- Shabrina, A. (2021). *Determinants of women's food safety and hygiene practice at their households* [Master's thesis, Sher-e-Bangla Agricultural University].
- Shariatifar, N., & Molaee-aghaee, E. (2019). Novel Coronavirus 2019 (COVID-19): Important tips on food safety. *Journal of Food Safety and Hygiene*, 5(1), 58–59.
- Unhale, S. S., Ansar, Q. B., Gajghane, V., Bharudkar, S. S., Gadekar, P. P., & Biyani, K. R. (2020). Impact of Covid-19 on food safety and food security. *World Journal of Advance Healthcare Research*, 4(5), 127–129.
- United Nations Industrial Development Organization. (2020). \*Agri-food and COVID-19 in Egypt: Adaptation, recovery and transformation rapid qualitative assessment\*.