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Which One The Winner? Pandemic Covid-19 And Food Safety Practices

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Abstract

This study was conducted to evaluate food safety practices in small and micro-scale manufacturers of herbal beverages produced at home during the COVID-19 pandemic. A total of 271 producers participating in the survey were selected using criterion sampling. The survey results show that herbal beverage manufacturers have a good understanding of personal hygiene, but are negligent in the use of personal protective equipment. The research findings show that the health crisis of the COVID-19 pandemic has not changed food safety practices in the Jamu as herbal beverages production process. In addition, there was an increase in the frequency of hand washing but it was not matched by compliance with the use of personal protective equipment as a preventive measure to prevent contamination.

Keywords: food safety, small and micro manufacturers, herbal beverages, the COVID-19 pandemic.

Introduction

The epidemic of COVID-19 has impacted the entire world and every aspect of human life. The coronavirus outbreak raises public awareness of danger and encourages everyone to practice transmission prevention behaviors. Globally, the growing number of cases has prompted everyone to be more careful about their own health and to undertake health practices to prevent transmission. The health program became the new standard of living. Numerous sectors, including the food business, have developed health measures to avoid transmission and recover the economy.

Agriculture, the food business, the food market, and catering have all become key industries in the face of a pandemic COVID-19 (Mayurnikova et al., 2020; Larisa et al., 2020; Ker, AP, & Cardwell, 2020; Rizou et al., 2020; et al., 2021). Everybody requires things and food. Consumers are concerned about their health and have high expectations of the food they consume. Individuals can alter their behavior about food and food safety when confronted with initial ambiguity about the transmission of COVID-19 via food and packaging (Shahbaz et al., 2020; Olaimat et al., 2020; de Freitas & Stedefeldt, 2020; Ceylan et al., 2020; Dardaque Mucinhato et al., 2021; Trmcic et al., 2021).

Safe food saves millions of lives since each bite of food contains the potential for disease transmission via microbiological or chemical contamination. Hazardous food is responsible for

numerous deaths, billions of people are at danger of exposure, and millions of people become unwell each year as a result of unsafe food (WHO, 2015). Food hygiene is a global issue, and it is well established that foodborne infections not only cause human illness and death directly, but also have a negative impact on countries' economies by raising health care costs in both the public and private sectors (Alrabadi et al., 2013).

According to research, food safety measures are a global issue, particularly for micro and small businesses. Food handlers' knowledge does not convert into practice (DaCunha et al., 2014; Pacholewicz et al., 2016). Inadequate understanding results in the adoption of harmful habits, which contributes to the spread of foodborne infections. According to studies, businesses react differently to obligatory adoption of food safety systems. This distinction exists within the food sector and subsector, as well as between food stores and caterers, as well as between MSMEs and major businesses (Taylor and Kane, 2005). In comparison to other organizations, multinational corporations have a more aggressive food safety culture. Micro and small food enterprises are unaware of cross contamination. Improper cooking techniques and a lack of cleanliness and sanitation on utensils contribute to the spread of food-borne diseases, and manufacturers are fully unaware of all potential causes of food contamination (Mlay, 2018). Foodborne disease, or FBD, is prevalent in locations where residents disregard hygiene and sanitation standards when processing food (Lubis et al., 2019).

Herbs are another prominent one in the COVID-19 pandemic era. Throughout the COVID-19 pandemic era, herbs are the most sought-after products in many parts of the planet (Sami et. Al., 2021; Ratnawatia et. Al., 2021; Perera et. Al., 2021). The majority of the world's population relies on herbal goods to meet their basic health requirements (Corbo et al. 2014). State epidemic conditions in the Coordinating Ministry for Economic Affairs (2020) COVID-19 increases daily demand for herbal products by 300-400 percent, resulting in a greater range of herbal items (Coordinating Ministry for Economic Affairs, 2020). Apart from capsules, pills, powders, and tablets, herbs can be produced in liquid form with a variety of combinations and flavors without compromising their advantages. Consumers are primarily interested in herbal preparations or herbs in liquid form or herbal beverages (Kemendagri, 2017). This creates tremendous opportunity for beverage manufacturers to create herbal beverages from processed herbs. While beverage products, particularly herbals, are in high demand, research on them is still quite restricted in comparison to research on food items. Herbal beverages are a fusion of food and herbal subjects. In general, herbal research examines the efficacy of a herb, its use, the level of knowledge about herbal products, the potential for herbal development, and ethnobotanical knowledge about herbal products (Anggreini et al. 2021; Adiyasa & Meiyanti, 2021; Susilowati. 2020; Rustiani & Sa'diyah, 2020; Elumalai et al.2020; Ang et al.2020; Additionally, the results of the Food and Drug Supervisory Agency (BPOM), the Ministry of Health (MOH), and the Provincial MOH regarding the circulation of herbs containing Medicinal Chemicals must be disclosed (BKO). In 2013, BPOM reported that 59 MSEs producing traditional herbal medicine employed a combination of BKO. This discovery involved herbal medicine manufacturers, particularly MSEs and the home industry (IRT).

Permadi et al. (2018) discovered the BKO content in herbal medication in 2018. This is counter to government legislation, particularly Law No. 8 of 1999 on Consumer Protection, and to the consumer's objective of drinking herbal medication in the hope of obtaining health advantages (Ministry of Health, 2010). Case This is the context for this research, which seeks to fill a void left by

earlier investigations. The purpose of this research is to fill a void in empirical research by examining food safety practices in beverage makers. The following research gap is a situational research gap, in which this study observes food production techniques in the context of a COVID-19 pandemic. Given that the COVID-19 epidemic has raised demand for herbal products (Lin & Zhang, 2020; BPOM, 2021), academics have begun to undertake study on herbal beverage makers, particularly small and microscale.

Materials and Methods

Location study

The survey was conducted in a community of herbal beverages producers in the city of Surabaya, Indonesia. The city of Surabaya has a center for producing herbal beverages which were introduced internationally as traditional Indonesian drinks.

Data collection

The questionnaire was designed to obtain information about food safety practices related to the herbal beverage production process. All items in the questionnaire were entered into the online application form so that respondents could easily provide answers to online questions, as physical contact between them is prohibited during the pandemic. The first part of the questionnaire was a consent form in which the participants were given time to read and provided their contact person indicating their consent to participate in the study. The second part of the questionnaire was to collect information on the characteristics of producers including length of business and legality of permits. The third part of the questionnaire contains questions to gather information about the food safety practices adopted.

The questionnaire as a data collection tool was previously conducted pre-tested in a preliminary survey using twenty (30) manufacturers located in the study area. Based on the responses obtained, the questionnaire was modified to be suitable as a research tool to collect relevant data. Pre-test questionnaires were not included in the final data analysis. The survey questionnaire uses a link posted on the Ligthouse studio digital platform. The survey was conducted in the field during September-October 2021.

Number of Samples

A total of 271 respondents who were met in the field were identified. Respondents who are responsible for the production division were asked to be willing and interviewed to find out about food safety practices carried out. Then respondents were asked to fill out a survey via a survey link that was shared on a digital platform, to avoid physical contact and prevent transmission during the pandemic.

Data analysis

Questionnaire responses were entered into a template (IBM SPSS 20) specially designed for this study. Data analysis using descriptive statistics and chi square testing was carried out to determine the extent to which food safety practices were applied.

Discussion and Results

Demographics of respondents

The demographic profile of the respondents is described in Table 1. The survey results are dominated by producers who run business for less than 1 year (42.43%) and are dominated by small-

scale producers with less than 5 employees (87.08%), this is likely due to the increasing demand for herbs during the covid-19 pandemic (Lin & Zhang, 2020; BPOM, 2021). Most (64.21%) respondents have not registered their businesses, this can be attributed to the information from the Food and Drug Supervisory Agency (BPOM) (2021) which confirmed that requests for distribution permits for traditional and herbal medicines increased during the pandemic.

Table. 1. Characteristics of Participants (N = 271)

Description	N	%
Licensing		
Have Licensing Legality	97	35.79
Non Legality of Licensing	174	64.21
Length of business		
Less than 1 Year	115	42.43
1-3 Years	73	26.94
4-5 Years	37	13.65
6-10 Years	26	9.59
More than 10 Years	20	7.38
Number of employees		
Less than 5 people	236	87.08
6-10 people	30	11.07
10-30 people	1	0.37
More than 30 people	4	1.48

Condition of Sanitary Hygiene Facilities

Table 2 summarizes the condition of hygiene and sanitation facilities in the production room. Activity was measured using yes and no responses. Almost all respondents reported thatThere is a hand washing area in the production room (91.51%), there is a bathroom in the production room (69.37%), soap is available in all places where there is a water faucet (93.35%), garbage bins are separated between dry and wet waste and there is a special washing area for production equipment (84.87%).

Table2. Sanitary Hygiene Facilities

Activity	Response	Amount	Percentage (%)
There is a hand washing area in the room production	Not	23	8.48
	Yes	248	91.51

There is a bathroom in the production room	Not	83	30.62
	Yes	188	69.37
Soap is available all over the place where there is a water faucet	Not	18	6.64
	Yes	253	93.35
The trash can is separated between dry and wet waste	Not	64	23.61
	Yes	257	94.83
There is a special washing area for production equipment	Not	41	15,13
	Yes	230	84.87

Food Safety Conditions and Practices

Table.3 summarizes the activities of personal hygiene practices in the production process. Activity was measured using a Likert scale. Almost all respondents reported that theycovering mouth when sneezing and coughing (81.18%), keeping nails clean (80.81%), washing hands with soap before and after doing activities (79.70%), washing hands according to hand washing standards (75, 64%), wash hands after handling anything (73.06%). Table 2 shows that covering the mouth when sneezing and coughing has the highest success rate. The findings in this study are overall consistent with previous research on evaluating food safety practices (Qadir et al, 2017; Alqurashi et al, 2019; Ahmed et al. 2021; Limon, 2021).

The highest score obtained was covering the mouth when sneezing and coughing, similar findings were also made by Limon (2021) who evaluated food safety practices in food handlers in online food businesses during the Covid-19 pandemic in the Philippines, in this research covering mouth when sneezing and cough has the second highest score after washing hands. With this assessment, it can be seen that respondents practice personal hygiene well to maintain consumer safety. Respondents prevent bacterial and viral contamination by covering their mouths when sneezing and coughing. Personal hygiene is a must for every food handler to reduce the transmission of bacteria and germs that can cause foodborne illness.

Table3. Personal Hygiene

Activity	Category	Amount	Percentage (%)
I wash my hands with soap before and after doing activities	Strongly disagree	2	0.73
	Do not agree	6	2.21
	Neutral	7	2.58
	Agree	46	16.97
	Strongly agree	216	79.70

I cover my mouth when I sneeze and cough	Strongly disagree	0	0
	Do not agree	7	2.58
	Neutral	6	2.21
	Agree	38	14.02
	Strongly agree	220	81.18
I keep my nails clean	Strongly disagree	0	0
	Do not agree	4	1.47
	Neutral	5	1.84
	Agree	43	15.86
	Strongly agree	219	80.81
I wash my hands after handling anything	Strongly disagree	0	0
	Do not agree	7	2.58
	Neutral	8	2.95
	Agree	58	21.40
	Strongly agree	198	73.06
I wash my hands according to hand washing standards	Strongly disagree	1	0.37
	Do not agree	5	1.84
	Neutral	8	2.95
	Agree	52	19.18
	Strongly agree	205	75.64

Table 4 summarizes the practical activities of using personal protective equipment (PPE) during the production process. Most respondents reported that they did not use a mask (85.24%), did not use gloves (81.85), did not use an apron (77.49%), did not use head coverings (62.36%), and did not use special clothing for the production room (51.29%). The use of masks has the highest failure rate in food safety practices.

Table4. Use of Personal Protective Equipment

Activity	Response	Amount	Percentage (%)
Using Mask	Not	231	85.24
	Yes	38	14.76
Using Gloves	Not	221	81.85

	Yes	50	18.15
Using Head Cover	Not	169	62.36
	Yes	102	37.64
Using the Apron	Not	210	77.49
	Yes	61	22.51
Using special production clothes	Not	139	51.29
	Yes	132	48.71

Table 4.1 summarizes the comparison of practices between producers who already have a legal license and producers without a legal license. The practice of using personal protective equipment (PPE) during the production process shows that there is no significant difference between producers who already have the legality of permits and those who do not yet have the legality of permits.

Table4.1 Comparison of the Use of Personal Protective Equipment in Manufacturers

Activity		**Non Legality (n = 174)**		**Have Legality (n = 97)**		**Sig. (2-tailed)**
	Response	**Amount**	**(%)**	**Amount**	**(%)**	
Using Mask	Not	132	75.9	6	6.2	.740
	Yes	41	23.6	91	93.8	
Using Gloves	Not	47	27.0	91	93.8	.724
	Yes	126	72.4	6	6.2	
Using Head Cover	Not	47	27.0	83	85.6	.696
	Yes	126	72.4	13	13.4	
Using the Apron	Not	125	71.8	16	16.5	.682
	Yes	48	27.6	80	82.5	
Using special production clothes	Not	91	52.3	40	41.2	.200
	Yes	82	47.1	56	57.7	

The results of the survey related to the use of BTP can be seen in table 5. The survey showed that from 271 herbal beverage manufacturers who participated in this study using the permitted BTP according to the maximum usage limit (64.57%), does not add preservatives (71.95%), adding synthetic dyes (19.18%) and do not add medicinal chemicals to their products (67.15%). This shows

that most of the producers participating in this study prioritize the quality and safety of consumers who consume their products.

Summarizing comparison related to the use of BTP between producers who already have the legality of licensing with producers without the legality of permits during the production process shows that there is no significant difference between producers who already have legality of permits and producers who do not yet have legality of permits.

Table5. Use of Food Additives (BTP)

Activity	Response	Amount	Percentage (%)
I use food additives (BTP) that are permitted according to the maximum limit for their use	Not	96	33.21
	Yes	175	64.57
I didn't add any preservatives	Not	76	28.04
	Yes	195	71.95
I added synthetic dyes	Not	219	80.81
	Yes	52	19.18
I didn't add any medicinal chemicals	Not	89	32.84
	Yes	182	67.15

Table5.1 Comparison of the Use of Food Additives (BTP) in Producers

Activity		Non Legality (n = 174)		Have Legality (n = 97)		Sig. (2-tailed)
	Response	n	(%)	n	(%)	
I use food additives (BTP) that are permitted according to the maximum limit for their use	Not	110	63.2	55	56.7	.258
	Yes	63	36.2	41	42.3	
I didn't add any preservatives	Not	123	70.7	68	70.1	.258
	Yes	50	28.7	28	28.9	

I added synthetic dyes	Not	31	17.8	16	16.5	.349
	Yes	142	81.6	80	82.5	
I didn't add any medicinal chemicals	Not	118	67.8	63	64.9	.258
	Yes	55	31.6	33	34.0	

Discussion

The profile in this study is dominated by small and micro-scale herbal beverages manufacturers. The

profile in this study is different from previous studies conducted in Pakistan (Qadir et al. 2017), Bangladesh (Nizame et al. 2019), Saudi Arabia (Alqurashi, 2019), Ghana (Yeboah et al. 2020), Brazil (Auad et al. al. 2021) and the Philippines (Limon, 2021). This study takes beverage manufacturers who tend to be rarely observed in research related to food and herbal safety as a goal, considering the increasing demand during the COVID-19 pandemic (Lin & Zhang, 2020).

In general, micro and small industries in the food sector have a poor understanding of food safety (Nyarugwe et al., 2018). In parallel, food handlers with poor levels of education and training are commonly reported in food services worldwide, especially in the street food sector in developing countries, where these informal enterprises are a source of employment and income for unskilled workers (Tinker, 1997).

The survey results show that covering your mouth when sneezing and coughing has the highest success rate. The findings in this study are overall consistent with previous research on evaluating food safety practices (Qadir et al, 2017; Alqurashi et al, 2019; Ahmed et al. 2021; Limon, 2021). Limon (2021) evaluated food safety practices among food handlers in a food business in the Philippines, in that research covering mouth when sneezing and coughing was the second highest score after washing hands. With this assessment, respondents can see the transmission of bacteria and viruses by covering their mouths when sneezing and coughing to maintain product quality and consumer safety.

The use of masks has the highest failure rate in food safety practices. The results found are consistent with research conducted by Limon (2021), most food handlers in the Philippines do not use protective clothing (99.5%); and do not use headgear and mouth coverings (99.0%). Another consistent finding was that (98.4%) did not use gloves and did not change gloves when handling raw and ready-to-eat food. Hashanuzzaman et al. (2020) conducted a study on food handlers in Noakhali, Bangladesh, the study was consistent with the results in this study that food handlers in Noakhali, Bangladesh, only (32%) wore protective clothing and only (12%) used masks when touching and distributing unwrapped food and no handlers wearing head coverings. Todd et al. (2010); Auad et al. (2019) confirmed that wearing gloves when preparing food can prevent bacteria that cause food-related diseases and avoid contact with potential sources of pathogens that can contaminate food (Nizame et al., 2019). Washing hands before work reduces the risk of food contamination (100%), wearing gloves is a substitute for cleaning hands (15%), wearing a head covering is important to reduce the risk of contamination during food handling (95%) (Auad et al., 2019).

The findings in this study contradict the results of the studyAlqurashi et al. (2019) that most food handlers at Al-Madinah hospital Saudi Arabia (81%) wore gloves when handling food during preparation, the majority of staff also indicated that they always used masks (70.6%) and head coverings (82 ,2%) when preparing and distributing food. This is in line with the research results of Qadir et al. (2017) on food handlers at Gomal Medical College that the majority of staff use head coverings during food production (76%), but in the context of using apron it is explained that (0%) staff do not use aprons. The context of the apron in the production process is consistent with the findings of this research. Differences in findings in previous studies can be caused by the respondent's environment. Respondents who work for agencies tend to be more obedient in using personal protective equipment compared to respondents who work for their own companies. This can happen because of food safety management applied to the agencies where they work and pressure from various internal stakeholders (Handayani et al., 2015; Dudeja et al., 2017). Meanwhile, food businesses tend to ignore food safety management (Fielding et al., 2005).

Traditional medicine or known as Jamu is a traditional herb that is beneficial for health and is made from medicinal plants. According to the Head of the Food and Drug Supervisory Agency (BPOM), the percentage of consumption of Indonesian herbal medicine in Indonesia is 59.12%. This high percentage shows that herbal medicine is still often consumed by the people of Indonesia. The existence of food additives, as a result, has made many herbal medicine manufacturers also use food additives in herbal medicine. There are certain food additives that are prohibited from using such as Methanil Yellow dye and regulated usage limits such as Saccharin sweetener. Resultsa survey in this study related to the use of BTP showed that more than half of the herbal beverage manufacturers who participated in this study stated that they used BTP that was allowed according to the maximum limit of its use, this finding is consistent with the study of Quraish (2018) which analyzed levels of saccharin (artificial sweetener) in jamu sinom. which are sold in the religious tourism area of Sunan Ampel, Surabaya. The survey findings regarding the recognition of manufacturers not adding synthetic dyes by 80.81% are in line with the research results Dwiyuningtyas, Anis (2018) who conducted laboratory tests on various herbal products in the city of Malang, that the herbal samples did not contain Methanil Yellow dye, but contained Saccharin sweetener.

The addition of medicinal chemicals is one of the cases of deviations from food safety standards that still often occurs in the process of making and distributing traditional medicines. The survey findings show that 67.15% of respondents stated that they did not add BKO to their products, this is in accordance with the findings in previous studies that BKO has never been found in herbal drink products, BKO is mostly found in herbal brewed and packaged products (Harahap (2021); Sinurat (2021); Mulkin et al. (2020); Rosyada (2019); Rahmatullah et al (2018); Wirastuti et al. (2016); Latif (2013)). The study results are consistent with the BPOM statement that traditional medicines that often contain medicinal chemicals are traditional medicines indicated for aphrodisiacs, pain relievers and rheumatism (BPOM, 2013).

Conclusion

The results of this study have not provided strong evidence that public health crises can contribute to changes in food safety practices in small-scale food producers regarding food safety. Surveys related to food safety practices show there is no significant difference between producers who already have the legality of licensing with producers who do not yet have the legality of licensing.

Policy Implication

Taking these findings into account, regulations that monitor and control food production should be established and standardized to ensure that the food products sold do not have the potential to cause foodborne illness. The findings of this study recommend all stakeholders to support food producers, especially small scale by facilitating access to permits, capturing aspirations related to the difficulties of producers in the field and expanding access to food safety practices, the risks of unsafe food which allows increasing awareness of producers and translating their lessons in the context of practice.

Research Limitations

This study has limitations in terms of self-reported surveys of food safety practices. The survey of food safety practices should be carried out with an investigative survey in the field so that the results obtained are able to describe the actual condition of food safety practices.

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