THE LEVEL OF FOOD INSECURITY PREVALENCE IN UNIVERSITAS SULTAN AGENG TIRTAYASA (UNTIRTA) BANTEN AMID COVID-19

Tingkat Prevalensi Kerawanan Pangan UNTIRTA Banten di Masa Pandemi COVID-19

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ABSTRAK

Wabah penyakit memiliki dampak global baik sosial maupun ekonomi, seperti pandemi COVID-19 saat ini. Akibatnya, prevalensi kerawanan pangan global meningkat dan keadaan ini juga terjadi di Indonesia. Penelitian ini menghitung tingkat prevalensi kerawanan pangan civitas academics Universitas Sultan Ageng Tirtayasa (Untirta), Banten. Food Insecurity Experiencing Scale (FIES) berisi 8 item survei, yang dikembangkan FAO dan telah digunakan di berbagai negara, digunakan untuk mengukur tingkat kerawananan pangan. Data yang diperoleh dianalisis dengan permodelan Rasch menggunakan software open akses R. Sebanyak 12,8% civitas academics Untirta termasuk ke dalam kategori rawan pangan moderat dan 3,8% termasuk ke dalam kategori severe rawan pangan parah. Kelompok civitas mahasiswa merupakan kelompok yang paling rentan rawan pangan, dosen adalah kelompok yang paling tahan pangan, dan staf merupakan kelompok yang paling beragam tingkat kerawanan pangannya. Tidak ditemukan korelasi antara ketahanan pangan dengan kondisi demografi seperti gender, umur, dan pendidikan. Mahasiswa sebagai kelompok yang paling rawan pangan memerlukan perhatian dari pemegang kebijakan baik universitas maupun pemerintah karena mahasiswa adalah generasi masa depan bangsa. Penelitian ini memberikan gambaran bagaimana tingkat kerawanan pangan di tingkat civitas academics pada masa wabah pandemi COVID-19.

Kata kunci: Civitas Academics, COVID-19, Kerawanan Pangan, Prevalensi, Untirta

ABSTRACT

Disease pandemic has a dramatic impact on global socio-economic, such as the current COVID-19 pandemic. Global food insecurity prevalence has increased as the impact of the pandemic and Indonesia is not an exception. In this research, we assessed food insecurity prevalence among *civitas academics* of Untirta, Banten. We used 8-items of Food Insecurity Experiencing Scale (FIES) that is globally used by FAO to measure food insecurity in many countries. The data was analyzed using Rash Model approach with free open access software R. A number of 12,8% of the respondents was categorized as moderate food insecurity and 3,8% was severe food insecurity. Among three groups of *civitas academics*, the students were the most vulnerable group to moderate food insecurity, the lecturers were the most secure group, and the staffs were the most diverse group from secure to severe food insecurity. There

was no correlation between food insecurity with social demographic factors such as gender, age, and education background. Students who experience moderate food insecurity should be given an intervention by the university and government to address this issue as students is our hope for better future of the nation. This research gives insight into food security among *civitas academics* in light of COVID-19 pandemic.

INTRODUCTION

COVID-19 pandemic has a dramatic impact on current global socio-economic. The UN Global Report on Food Crises 2020 predicted the impact of COVID-19 in world economic and food security, estimating 130 million people facing acute food insecurity by the end of 2020. World Food Program (2020) reported that more than 1.4 million Indonesian households were moderately or severely food insecurity due to the economic impact of the pandemic. This number obviously reaches many different social/population niches, including university *civitas academics* that represent people in the households.

Food security is a status when people have reliable access to sufficient, safe, and nutritious food to fulfill dietary needs for an active and healthy life (World Food Summit, 1996). The food security is a challenging concept to measure since it deals extensively in four dimensions i.e. availability, access, utilization, and stability. One way to monitor hunger in the population is using the Food Insecurity Experiencing Scale (FIES). Food and Agriculture Organization (FAO) used this tool in the context of

Sustainable Developments Goals framework, goal 2 to end hunger (FAO, 2019). However, FIES is a measure only of the access food dimension. Nonetheless, it is easy to use, low cost, and statistically powerful scale to distinguish between different severity level.

Many studies and survey of food insecurity in Indonesia focused in assessing the household's population in the region or provinces. To our knowledge, none of them, studied the prevalence of food insecurity among students and *civitas academics* in colleges, university or schools. Many studies showed the high prevalence of food insecurity among students in colleges and university (Daniel et al., 2014, Davidson & Morrell, 2018; Owens et al., 2020; Soldavini & Berner, 2020). Food insecurity among students might affects their academic performance, health, and psychosocial (Davis et al., 2020; Gundersen & Ziliak, 2015). Universities and colleges are source of future academic intellects, teachers, entrepreneurs, philosophers and leaders of a nation. Thus, their health and reliable access to food is essential for success. However, the knowledge of food insecurity among students and

civitas academics in Indonesia remains elusive.

This research was aimed to assess food insecurity prevalence among *civitas academics* in Universitas Sultan Ageng Tirtayasa (Untirta) Banten. As one of the leading universities in Banten, Untirta takes social responsibility to promote food security and decrease food insecurity. One crucial role is to establishment of the Centre of Excellent for Food Security (*Pusat Unggulan Inovasi Perguruan Tinggi (PUI-PT) Ketahanan Pangan Inovasi Pangan Lokal*). The center is leading scientific and academic research on food security focus on local food innovation research in Banten and beyond. In light of pandemic crisis COVID-19 this research could give insight into food insecurity prevalence into sub population in the community, in the example of *civitas academics* of Untirta.

METHODS

Population

The population of this research was *civitas academics* of *Universitas Sultan Ageng Tirtayasa*, Untirta, Banten. Untirta consists of 8 faculties (education, law, economics, political science, agriculture, engineering, medicine, and graduate school) and administration units. Untirta campus is located in four places Pakupatan, Ciwaru, Cilegon, and Kepandean. We defined three groups of the *civitas academics* of Untirta as lecturer, student, and staff. Lecturer is a person teaching and researching at one of the faculties, student is an active enrolled student of undergraduate and graduate school, and staff is a person working in the administration office, whether academics and non-academics administration.

Pilot Study

A pilot study was conducted in February 2020 (unpublished data). Survey forms were sent to students in the faculty of education. An 8-item online survey was adapted from the food insecurity experience scale survey (FIES) used by FAO (Cafiero et al., 2017). The participants of the survey were students of Food Security Course in the first semester of academic year 2019/2020. The Food Security Course is the obligatory course in Untirta's curricula, thus the students that were participated in the survey encompassed all faculties in Untirta. In total, 569 students responded to the survey consisting of 56 males and 513 females. The results indicated that during the past 12 months, prevalence rate of moderate food insecurity of students was 36.39% and prevalence of severe food insecurity was 2.43%. Students who lived in campus housing (*kos-kosan*) were more likely to be food insecurity compared to those living off campus, living with their family. The finding was considered to be relatively high prevalence of food insecurity among students. Therefore, the results encouraged the authors to study larger respondents with broader role in the campus.

Survey

The survey was conducted in July 2020, mainly by using Google Form. The form was opened for 4-weeks. In a very limited number of respondents (staff), survey was done by direct interview. The 8-items FIES survey module was used to measure the prevalence food insecurity status (Cafiero et al., 2017; Nord, 2014). The FIES instruments used for the survey were translated into Bahasa Indonesia, shown in Table 1. The purpose and methodology of the study was approved by each dean of the faculties that help the authors distributed the survey forms.

Statistical Analysis

Data were tabulated and analyzed using free open access software R (https://www.r-project.org/), with RM weights package (Viviani, 2016). Food insecurity prevalence was calculated according to Nord (2014) using Item Response Theory Approach (IRT) Rasch model, where the instruments were validated to be reliable to be applied in Indonesian population (Herlina et al., 2020). Data analysis consisted of two steps: statistical validation and calculation of measurement of food insecurity. Statistical validation assessed the quality of the data collected by testing their consistency with the assumption of Rasch model. The measurement of food insecurity based on population prevalence estimates, the probabilities were then used to estimate the prevalence of food insecurity at moderate ($FI_{mod-sev}$) and severe levels ($FI_{mod-sev}$) in the population. $FI_{mod-sev}$ is the proportion of the population experiencing moderate to severe food insecurity, thus considered as food insecurity at moderate level. FI_{sev} is the proportion of the population experiencing severe food security. Food insecurity prevalence rate is defined according to global standard thresholds and sets along with the scale of security. Thus, our data were mapped according to the standard global data used by FAO. The FIES items ATELESS and WHOLEDAY are standard threshold in defining the moderate and severe food insecurity class.

RESULTS

A total of 639 participants responded to the survey. The characteristics of respondents are presented in Table 2. The highest number of participants were primarily students (59%), followed by lecturers (29.7%), and the least number participants were staffs (10.3%). These numbers were expected since the largest number of *civitas academics* in Untirta is student (23,481), while lecturer (780) and staff (523) shared relatively less significant number (www.untirta.ac.id). The participation in the survey was low. This is perhaps due to the limitation in the distribution and socialization of the survey form since most of the people work, study, and teach from home in the pandemic time.

Tabel 1.
The 8-items FIES instruments (in Bahasa Indonesia)

	Standard Label	Question wording
Q1	WORRIED	*Selama setahun terakhir, apakah Anda khawatir tidak akan memiliki cukup makanan untuk disantap karena kurangnya uang atau sumber daya lainnya?*
Q2	HEALTHY	*Selama setahun terakhir, apakah Anda tidak dapat menyantap makanan sehat dan bergizi karena kurangnya uang atau sumber daya lainnya?*
Q3	FEWFOODS	*Selama setahun terakhir, apakah Anda menyantap sedikit jenis makanan karena kurangnya uang atau sumber daya lainnya?*
Q4	SKIPPED	*Selama setahun terakhir, apakah Anda tidak makan pada jam makan karena kurangnya uang atau sumber daya lain yang cukup untuk mendapatkan makanan?*
Q5	ATELESS	*Selama setahun terakhir, apakah Anda makan lebih sedikit daripada seharusnya karena kurangnya uang atau sumber daya lainnya?*
Q6	RANOUT	*Selama setahun terakhir, apakah Anda kehabisan makanan karena kurangnya uang atau sumber daya lainnya?*
Q7	HUNGRY	*Selama setahun terakhir, apakah Anda merasa lapar tapi tidak makan karena kurangnya uang atau sumber daya lainnya?*
Q8	WHOLEDAY	*Selama setahun terakhir, apakah Anda tidak makan seharian karena kurangnya uang atau sumber daya lainnya?*

The majority of respondents was female (61%), in the age between 21-30 years old (37.9%). This result corresponds with our pilot study (data unpublished) that the majority respondents are female of average age 21-30 years old, as the most number respondents were from students. Respondents with high school education backgrounds were the highest number. This is perhaps due to the misunderstanding of the respondents' last education. Many of the students were high school instead of bachelor degree.

Table 2.
The subjects characteristics of *civitas academics* of Untirta

Subjects characteristics	n (%)
Role in the *civitas academics*:	
Lecturer	190 (29.7%)
Student	383 (59.9%)
Staff	66 (10.3%)
Gender:	
Male	252 (39%)
Female	387 (61%)
Age:	
>50	27 (4.8%)
41-50	94 (17.3%)
31-40	151 (25.25%)
21-30	227 (37.9%)
<20	100 (16.7%)
Education:	
High School	231 (36.2%)
Bachelor	178 (27.9%)
Graduate	156 (24.4%)
Doctor	74 (11.6%)

Table 3.
Summary of output: item parameters and fit statistics

Item	Severity	SE Severity	Infit	SE Infit	Outfit
WORRIED	-1.70	0.18	1.26	0.07	2.03
HEALTHY	0.20	0.21	1.01	0.12	1.00
FEWFOOD	-0.81	0.18	0.86	0.08	0.75
SKIPPED	-0.29	0.19	0.95	0.10	0.80
ATELESS	-0.29	0.19	0.98	0.10	0.98
RANOUT	0.57	0.22	0.96	0.13	1.08
HUNGRY	0.36	0.21	0.85	0.13	0.69
WHOLEDAY	1.96	0.31	1.14	0.21	0.70

Statistical Validation

From the total of 639 respondents, 89 respondents did not respond the survey items completely thus they are removed from the data set. Statistical validation was used to measure the performance of the collected survey data. The summary of the output (fit statistics) of Rasch Model (RM) validating the survey items is presented in Table 3. Fit (infit and outfit) statistics indicates whether an item is performing well and consistent in the populations or not. The items were performing well with infit value 0.7-1.3 and outfit value < 2 (Viviani, 2016). Using these assumptions, all **items** surveys were performing well, except for "WORRIED". Therefore, this item was excluded from the calculation of prevalence food insecurity.

The residual correlation (0.009 – 0.26) indicated that all items were independent from each other, thus there is no correlation between items in the survey. They met the local independency assumption. The overall Rasch reliability of items survey gives coefficient reliability flat 0.709. This means that all the items survey was performing well for estimating food insecurity (Cafiero et al., 2017; Nord, 2014).

Food Insecurity Prevalence

Measurements of food insecurity of *Civitas Academics* of Untirta were mapped into FIES global reference (Figure 1). The prevalence of food insecurity among *civitas academics* of Untirta at moderate level ($FI_{mod-sev}$) was 12.8% and at severe level was (FI_{sev}) 3.8% (supplementary materials). Among the *civitas academics* groups, student was the most vulnerable group to moderate food insecurity. This finding corresponded to our pilot study with students as target population where the composition in the population is 36.4% of moderate level and 2.5% of severe levels. There is no correlation between food insecurity level and demographic groups except the age. Ages between 20-30 and 30-40

years old are the most vulnerable group to moderate food insecurity. These results also were expected, as the average age of students was in the range of age groups. Among three groups of *civitas academics*, student was the most vulnerable group to moderate food insecurity, lecturer was the most secure group, and staff was the most diverse group from secure to severe food insecurity.
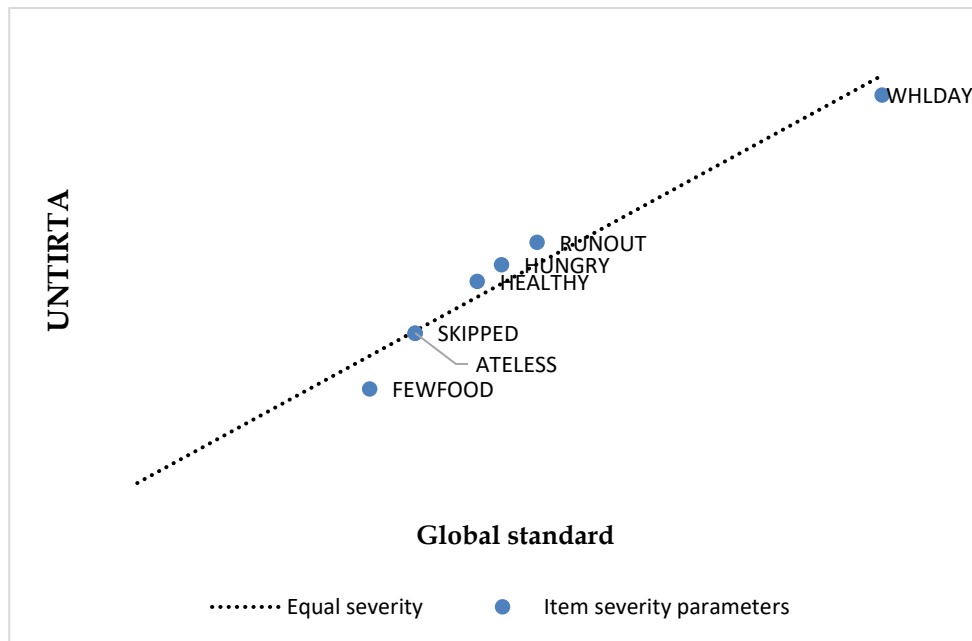

Figure 1. The FIES civitas academics Untirta mapped to FIES global reference scale.
The line is the global standard equal severity, blue dots are the item severity parameters in this study. The more the blue dots to the line the closer the severity to the global standard.

DISCUSSION

The global COVID-19 Pandemic has impacted on many aspects of our lives. The World Food Program (WFP) reported that the pandemic contributed to the increase of global food crises 2020 (World Food Programme, 2020). One of the indicators of global food crises is the prevalence of food insecurity in the population. In this research, the food insecurity prevalence in university population, Untirta, during pandemic in 2020 was assessed.

A tool with the potential to provide information about food insecurity is by asking people directly about their experience of food insecurity. This approach has been used by FAO in many countries for national monitoring purposes – some for more than a decade. Because of the health regulation of physical distancing, we used online survey using online survey platform. The number of participants was relatively low from what we expected. Obviously, the most effective survey method is direct interview of participants. This survey method is commonly used for

national survey. Many studies demonstrated that the survey conducted via online survey had low response rate (Davidson & Morrell, 2018; Henry, 2017; Owens et al., 2020).

University/college is the most important milestone age for students, as this phase of their life might have long effects. Food insecurity can potentially affect their academic performance, cognitive and psychosocial development. Studies in many universities in the US shows high prevalence of food insecurity of college students (Daniel et al., 2014; Davidson & Morrell, 2018; Henry, 2017; Morris et al., 2016; Soldavini & Berner, 2020). These studies also demonstrate that the level of food insecurity of students was higher than the larger populations. Thus, students were sub-population highly potential to vulnerable to food insecurity.

The increase of student's tuition fee of education in Untirta might likely impact student's socio-economy. Our data showed the students living in campus housing (*kos-kosan*) are prone to moderate food insecurity compared to those living with their family. The first group needed to spend more money to pay for rent, food, and other expenses. Food insecurity might give potential consequence for student health, learning, and social outcomes. It should not be considered as an accepted aspect of the impoverished student experience, but a major student health priority (Barrett, 2010). Students with low income should be given

priority for scholarship or subsidy for their university expenses (Rajikan et al., 2019).

Lecturer was the most secure group to food, and staff was the most diverse group from secure to severe food insecurity. It is common that people with less income will likely experience food insecurity at certain level (Tanziha, 2011; Timmer, 2004). In Untirta Banten, 70% of lecturer are civil servants (PNS) and the rest are non-PNS with equal rights on income and social security (employment, health care etc.). Thus, this group was expected to be food secured. However, for staff group, most of them were employed with temporary contract, with less income and social security rights. Therefore, they are prone to food insecurity due to their low income. Our data showed that this group were eating less diverse food and were unable to buy nutritious or balance food (FEWFOOD, Figure 1.). The survey in Pakistan, Canada and US showed that the low-income households are most likely unable to afford enough food with good dietary requirements (Akbar et al., 2020; Seligman et al., 2010). The same pattern is also happening in almost part of the world, as well as in Indonesia (FAO 2019, FAO and Government of Indonesia, 2017). This group is the main concern of government to reduce food insecurity, which sometimes hidden in the population society.

As part of Banten province, Untirta contributes to the status of the

provincial food insecurity in Banten. In 2017, Banten was categorized as Priority-3 in the category, the province with low food security (Setiawan et al., 2017). The mandate of Directorate General of Higher Education (DIKTI), Ministry of Education of Indonesia, for the establishment of center excellence of food security, *Pusat Ketahanan Pangan (Inovasi Pangan Lokal)*, at Untirta could be a breakthrough in solving this problem. The center main vision is the innovation of local food that could be used to decrease food insecurity, in Banten and Indonesia (Untirta, 2020). One way to decrease food insecurity is to find new sources of food, specially local food, and efforts (such as policy regarding food security) should be done in local and national level (Marlina et al., 2020; Maryani et al., 2020). The uncertain ending of the pandemic situation could impact food security of broader population and society more than *civitas academics* of Untirta. Therefore, further study in assessing the food insecurity of household and individual as impact of pandemic time is needed in Indonesia as some studies demonstrated such conditions (Hirvonen et al., 2020; Owens et al., 2020).

CONCLUSION

The food insecurity prevalence among *Civitas Academics* of Untirta Banten was 12.8% moderate and 3.8% severe. The students were the most vulnerable population to moderate food insecurity and the rate for moderate food insecurity was high (36.4%). The lecturers were the most secure group to food, and the staffs were the most diverse group from secure to severe food insecurity. There was no correlation between groups of *civitas academics* and theory food insecurity prevalence to demographic factor such as gender, age and education background. Student's vulnerability to moderate food insecurity should be the main concern of university and government. Reduction of tuition fee and food subsidy for students could decrease the rate, as the food insecurity could affect their academic performance and other social impact. Centre Excellence of Food Insecurity (local food), *PUI-PT Ketahanan Pangan (Pangan Lokal*) Untirta will boost the inventory of new sources of local food to decrease food insecurity prevalence in Untirta, Banten, and Indonesia. Further study of the prevalence of food security rate caused by the impact of COVID-19 in broader population is needed.

ACKNOWLEDGMENT

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