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Qualitative and quantitative research on a relationship between food security and well-being among students in Almaty city

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Abstract. The main aim of this paper is to examine the potential influence of collectivism on the well-being and food insecurity of university students in Almaty.

35 college students were selected for qualitative in-depth interview. The primary objective of this study is to examine the potential influence of collectivism on the well-being and food insecurity of university students in Almaty. To this end, a qualitative in-depth interview was conducted with 35 college students. In addition, a quantitative analysis was conducted with 244 undergraduate, graduate, and PhD students from 5 universities to check significant, validity and reliability in spring semester of 2023 for quantitative analysis.

Authors used mixed method. Firstly, qualitative in-depth interview with based on a set of literature-derived questions. Then, the USDA 6-item food security module survey was used to measure food insecurity. The World Health Organization Five Factor Well-Being Index used to measure well-being of the students. To measure collectivism Communal Orientation Scale (COS) with 14-items were used.

It was found that well-being positively effect on food security and their significance is high. While, collectivism has a negative impact on their relation with a high level of significance.

Keywords: Food security, well-being, collectivism, qualitative analysis, quantitative analysis

Introduction

The most recent data reveals that over 820 individuals, constituting one in nine people globally, faced hunger in the year 2018 [1]. Numerous initiatives are being endorsed to address this issue by conceptualizing and promoting food security [2]. Food security is attained when all four aspects – availability, accessibility, utilization, and stability of food – are upheld [3]. Neglecting any of these components may have adverse effects on human development [4] and the health of a population [5].

Africa and Asia are the regions experiencing the highest levels of undernourishment. Recent data indicates positive trends in reducing undernutrition rates; however, the sheer magnitude of these figures remains significant. Additionally, as per the USDA, Kazakhstan ranks 96th out of 104 countries in food expenditure, with a percentage of 44.9 [6]. Notably, countries facing more significant food insecurity, such as Cambodia, Ghana, and Guatemala, rank higher than Kazakhstan. It is worth noting that developed and affluent nations tend to allocate a smaller proportion of their budget to food expenditure. For instance, the USA allocates 6.4 percent, the UK allocates 8.1 percent, and so forth. Internal data from the third quartile of 2019 indicates that the average household spending in Kazakhstan was 569.6 thousand tenge (\$1300), with 49.9 percent (284.3 thousand tenge or \$660) allocated to food expenditure [6]. The majority of this expenditure is directed towards meat (35.4 percent), bakery products (14.2 percent), dairy (9.9 percent), fruits (8.5 percent), and sugar, confectionery, and sweets (7.5 percent) [6].

Furthermore, it is important to note that the prices of these items escalate annually. As of 2020, the living wage in Kazakhstan is set at 32,668 tenge (\$75), representing the amount required for essential products [7]. However, the scholarship for college students is only 20,948 tenge (\$48), which falls below the established living wage [8]. Additionally, lifestyle and dietary habits are crucial factors influencing the onset of gastritis [9].

Almost half a million students (496,209) are enrolled in educational institutions in Kazakhstan, with 41% (202,901) originating from various cities or regions. Furthermore, 131,292 students are pursuing their studies in Almaty [7]. According to the independent news portal *azattyq*, all universities in Almaty face a shortage of dormitory spaces for students. For instance, Al-Farabi Kazakh National University, the largest university in Almaty and Kazakhstan, cannot accommodate dormitory needs for 16,000 out of its 27,000 students [10].

Typically, students in Almaty come from various regions of the country, and a limited number of them can secure dormitory accommodations. Additionally, it's worth noting that the cost of living in Almaty exceeds that in other regions of Kazakhstan and continues to rise annually. For instance, in 2016, the rental cost for dormitories tripled compared to the rates in 2015 [10]. Consequently, students face challenges in residing in a major city like Almaty, struggling to access affordable and nutritious food, even if they receive a scholarship.

Literature review

Food security, as defined by the FAO in 1996, ensures that all individuals consistently have both physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs

and preferences for a healthy and active life. This comprehensive concept is structured around four essential pillars outlined by the FAO in 2014. Availability focuses on the tangible existence of an abundant and diverse food supply, considering factors such as local production, commercial imports and exports, food aid, and national stocks. Accessibility extends to households having the financial means to obtain food, taking into account challenges like inadequate infrastructure and limited access to transportation. Utilization involves an individual's ability to embrace diverse foods and convert them effectively for nutritional benefit. Stability encompasses the enduring condition of food security, which can be influenced by various factors such as natural disasters, political conflicts, and price volatility [11].

Numerous investigations indicate that a substantial proportion of college students, ranging from 14 to 72 percent, experience food insecurity [12-13]. The repercussions of food insecurity extend to both physical and mental health, manifesting in issues such as poor self-reported health, suboptimal diet quality, obesity, diabetes, depression, anxiety, and gastritis [9]. Furthermore, students facing food insecurity encounter depressive symptoms and exhibit lower academic performance [13].

In 2008, during the Great Recession, researchers documented the food insecurity scale among students. It was hypothesized that factors such as expenses related to education, books, transportation, and inadequate financial aid could impact their fundamental needs, including housing and food. Additionally, the ongoing annual increase in tuition fees in our country is acknowledged. Moreover, aspects tied to the educational process, such as the costs of notebooks, housing, and communal expenditures, pose significant challenges for students [13]. To cope with food insecurity, university students employ strategies like refraining from purchasing course-related materials, altering their eating habits, and resorting to overworking [13]. Lastly, research suggests that a lack of financial knowledge and skills contributes to food insecurity among university students [14].

Previous research demonstrates an inverse correlation between food insecurity and the quality of diet, academic performance, and mental/physical health [15]. These studies indicate that individuals facing food insecurity tend to exhibit poor eating habits, restricted access to fruits and vegetables, and overall unhealthy dietary patterns, leading to compromised health and lower academic achievement [14]. Addressing the issue of food insecurity is crucial due to its potential impact on the physical and mental health of students, as well as their academic performance.

Bruening highlights a strong connection between well-being and food insecurity within the general population [16]. Additionally, Liu demonstrated that insufficient sleep is prevalent among adults experiencing food insecurity. In this study, the focus is narrowed to examine the impact of collectivism on students [17].

We elucidate the interaction between collectivism and food insecurity/well-being through the framework of cultural mindset theory [18]. This theory posits that situational and dynamic cognitive modes are activated when a chronic orientation becomes prominent. Collectivism triggers a mindset rooted in holistic thinking, leading to heightened perceptions of interconnectedness between oneself and others [19]. The degree of collectivism reflects an individual's self-perception within their social groups, emphasizing their connection to others as part of a group. Conversely, some individuals pay less attention to their surroundings [20].

Recent research, exploring the connection between food insecurity and well-being, has examined the impact of homelessness and academic performance on individuals [21]. However, the significance of these findings may vary due to a lack of validation and reliability checks on measures of well-being and food security. Addressing this gap in the literature, the author of this paper conducts an examination of the validity and reliability of the questions used. Additionally, the study considers how collectivism influences the interaction between food insecurity and well-being. Therefore, the primary goal of this paper is to investigate the relationship between food insecurity and well-being, with a specific focus on the moderating effect of collectivism.

Methodology

This study employed a mixed-method approach. Initially, the researchers conducted qualitative in-depth interviews, followed by the administration of a quantitative survey. Subsequently, descriptive statistics were applied to interpret findings from the qualitative research, and the qualitative in-depth interviews were organized. Finally, the researchers interpreted descriptive statistics for the quantitative analysis, presented information about the quantitative method, and reported the results.

Qualitative analysis

The qualitative research phase occurred at one of the largest colleges in Almaty, Kazakhstan, catering to nearly 2,000 students from various regions of the country. Students were selected for qualitative in-depth interviews using a snowball sampling system, with a predominant representation of ethnic Kazakhs. A total of 35 students (26 males, 9 females) participated in this research. Among the participants, 72% identified as ethnic Kazakh, 14% as Russian, and the remaining 14% belonged to other nationalities. Eleven of the students were born and reside in Almaty with their parents, while the remaining 24 come from different regions of the country and reside in dormitories or rented flats. Additionally, 86% of the students receive financial aid, such as scholarships, while 14% do not.

The interviews were conducted on the college campus, and participants were assured of the confidentiality of the information shared. Prior to the interviews, participants filled out a brief survey regarding their status. The author facilitated and moderated all sessions, with each interview lasting between 15 to 20 minutes and adhering to a semi-structured format. Smartphone audio recordings were made of all interviews, and participants received theater tickets as a token of appreciation for their involvement.

The interview questions drew inspiration from qualitative literature on food insecurity, specifically the work of Watson et al. (2017) (refer to Table 1). Subsequently, these questions were translated into Kazakh and Russian, the most widely used languages in our country. The primary objective of the questions was to delve into the subject and identify potential new moderating indicators. For example, the interviews commenced by inquiring about the student's usual eating or food sources and exploring the factors that are significant to them.

Table 1 - Questions used to guide interview

#	Food security
1	Please describe what you know about food insecurity at your college
2	Why do you think some students are food insecure at your college?
3	How does the cost of living, including tuition, housing and meal plan, supplies, etc. impact your access to food?
4	If you receive financial aid, how does this impact your access to food?
5	If you or another student you know has experienced food insecurity, how were you or someone you know affected?
6	Do you know about any campus resources available to college students in need of food?
7	What are some solutions that could be implemented at college to help overcome student food insecurity?
Note – compiled by authors	

The authors transcribed the audio recordings into seven sets, each containing five interviews. Subsequently, Atlas.ti software was employed for the analysis. The data was coded and categorized into eight main topics, with the authors focusing on key themes such as awareness, basic needs, collectivism, cost of living, variations in eating habits, financial aid, reasons for student food insecurity, and well-being. Further elaboration on these topics is provided in the results section.

Quantitative analysis

Following the completion of in-depth interviews, the findings indicated a potential influence of well-being and collectivism on food security, as detailed in the results section below. For the pilot version, a total of 244 students from five major universities in Almaty were selected using snowball sampling. It's noteworthy that Almaty serves as the primary research hub in Kazakhstan, being the largest city in the country where a quarter of all students in Kazakhstan pursue their studies. Additionally, a significant proportion of these students face challenges related to the cost of living, as highlighted in previous reports [10]. This context suggests a potentially high relevance of collectivism in this setting.

Due to the impact of COVID-19 and the implemented quarantine measures in Almaty city, data collection was conducted through mail, WhatsApp, and smartphone calls. Surveys encompassing demographic details, food security, well-being, and collectivism were translated into Kazakh and distributed to participants via email. Some individuals opted to complete the survey through WhatsApp. Participation in the survey was entirely voluntary, and participants were assured of the confidentiality of their responses.

Over 250 questionnaires were distributed to students, and 244 were returned; six were excluded due to incomplete or missing data. This resulted in a total of 238 participants, comprising 132 males and 106 females. The mean age of the participants is 21.67 (SD=4.131),

ranging from 16 to 35 years old. In terms of academic standing, 12.5% are Ph.D. students, 17.5% are pursuing a master's degree, 10% are in their fourth year, 27.5% are in their third year, 20% are in their second year, and 12.5% are in their first year. Exactly half of the participants receive a scholarship. Among them, 57.5% are not citizens of Almaty, and 47% rent a flat, while the remaining participants either live in a dorm or have alternative housing arrangements.

Measure

The assessment of food security utilized a 6-item brief version of the US Household Food Security Survey module. This questionnaire comprises six inquiries concerning the capacity to afford balanced meals, financial ability to purchase food, reductions in meal size or consumption, and experiencing hunger due to a lack of money. Responding with 0-1 negative answers indicates food security, while 2-4 negative answers suggest low food security, and 5-6 negative answers indicate very low food security [22].

The well-being assessment in the survey employed The World Health Organization Five Factor Well-Being Index, comprising five questions with Likert-type response options ranging from "at no time" to "all the time." Each variant is assigned a score from 1 to 6, where a higher score corresponds to a greater level of well-being for the student. These questions aimed to gauge the frequency with which participants experienced positive emotions such as a good mood and calmness over the past 14 days [23].

H1: Well-Being positively affects food security

Collectivism is assessed using the Communal Orientation Scale (COS), which is a 14-item 7-point Likert scale. Participants rate each item on a scale from 1, indicating "extremely uncharacteristic of me," to 7, indicating "extremely characteristic of me." The scale includes questions such as "It bothers me when other people neglect my needs" and "When making a decision, I take other people's needs and feelings into account," among others [24].

H2: Collectivism moderates the relationship between Well-being and food security

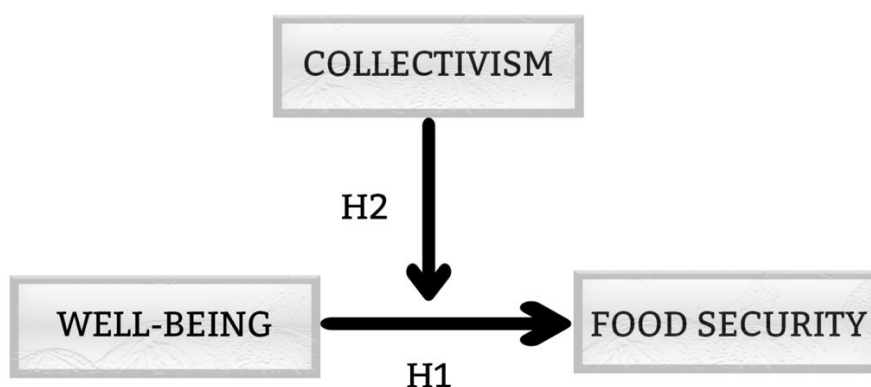


Figure 1 – Research model

Note – compiled by authors

To conduct statistical analysis, the author employed Excel for data preparation (which was later converted to CSV), and SmartPLS (Partial Least Squares) was utilized for assessing significance, validity, and reliability. Mean values were employed to present the demographic status, food security, well-being, and collectivism of the students. Subsequently, a research model was constructed to estimate the relationships among these variables, as illustrated in Figure 1. In this model, food security served as the dependent variable, well-being as the independent variable, and collectivism functioned as the moderating variable.

Findings and Discussion

Qualitative analysis results

Participants engaged in discussions on various themes related to food security. Table 2 presents the primary topics along with relevant quotes.

Table 2 – Themes and quotes about food security (n=35)

Themes	Quotes
Awareness	<p>“Actually, I didn’t know about (food literacy) it. How to choose and where to eat. Then my mom and brother taught me”</p> <p>“It is really important for me (to be aware). To identify quality and expire day. Because, it affect on your health.”</p>
Basic needs	<p>“Foods should be cheaper than it is. And we need additional canteen”</p> <p>“You have to have a freedom of choice in canteen. And menu should be diverse each time.”</p>
Collectivism	<p>“If we have some food, we give them to guys who live in rental flat”</p> <p>“I had a situations when I have money for my self (to eat), but at same time I saw that my friends didn’t. Then I decided, not to eat”</p>
Cost of living	<p>“It is highly impact. For example, if you took a loan, you short your food prefernces.”</p> <p>“Affects... especially for students who rent a flat.”</p>
Differences of eating	<p>“I think even if you live with parents in Almaty, you do not eat well when you are a student. Students are always hungry. It is what I understand”</p> <p>“When you are a student, all your time is spending on outside, while at school time you are usually at home”</p>
Financial aid	<p>“(Scholarship) Does not impact well... Most of money spends on the way to college and back.”</p> <p>“It has a big impact. You can pay for other your needs and eat well”</p>

Why food insecure?	“More or less it depends on money” “I think it depends on parents, how they teach children” “When I go to market I see how students spend they are money to cigarettes and make a limit to get healthy food.”
Well-Being	“If you are tired or hungry, you cannot focus on study” “I choose to sleep five more minutes and then go to college than eat breakfast before going”
Note – compiled by authors	

Awareness

The majority of students demonstrated awareness in selecting and assessing the quality of food, having acquired this knowledge from their parents or relatives. A significant portion of them acknowledged personal experiences with food insecurity and confirmed its prevalence among their peers.

Basic needs

Nearly all the participants expressed a desire for more affordable prices and a varied menu. In contrast, students residing in the city with their parents conveyed contentment, noting that everything is satisfactory, and the food quality is high.

Collectivism

Students exhibited a strong sense of collectivism, often choosing to eat as a group or collectively experiencing hunger if such a situation arises.

Cost of living

Regular expenses like tuition fees and rent can significantly impact a student's capacity to access sufficient food.

Difference of eating

This was inquired to understand if there were any variations in eating habits between their time as pupils and their current status as students. It was observed that students often experience hunger even when residing with their parents.

Financial aid

The author discovered that financial aid has a more pronounced effect on students who rent accommodations and come from various regions. Additionally, a significant portion of scholarship funds is typically allocated to commuting expenses. In contrast, students living with their parents do not perceive the same impact from financial aid.

Why food insecure?

The responses were largely consistent, leading to the conclusion that students are vulnerable to food insecurity due to insufficient financial resources, as well as the upbringing by both their parents and themselves.

Well-Being

Subsequent inquiries revealed that nearly all students prioritize getting more sleep over having breakfast. Furthermore, they indicated that when in a good mood, they tend to choose to eat well.

Quantitative analysis results

Initially, the author executed the model with the entire dataset. Subsequently, questions that inadequately represented the variables were eliminated. In the pilot version, questions with coefficients less than 0.6 were excluded. Four out of five questions were deemed representative of well-being, three out of six questions could effectively illustrate food security, and only three out of fourteen questions were identified for potential use in measuring collectivism in future research (Fig. 2).

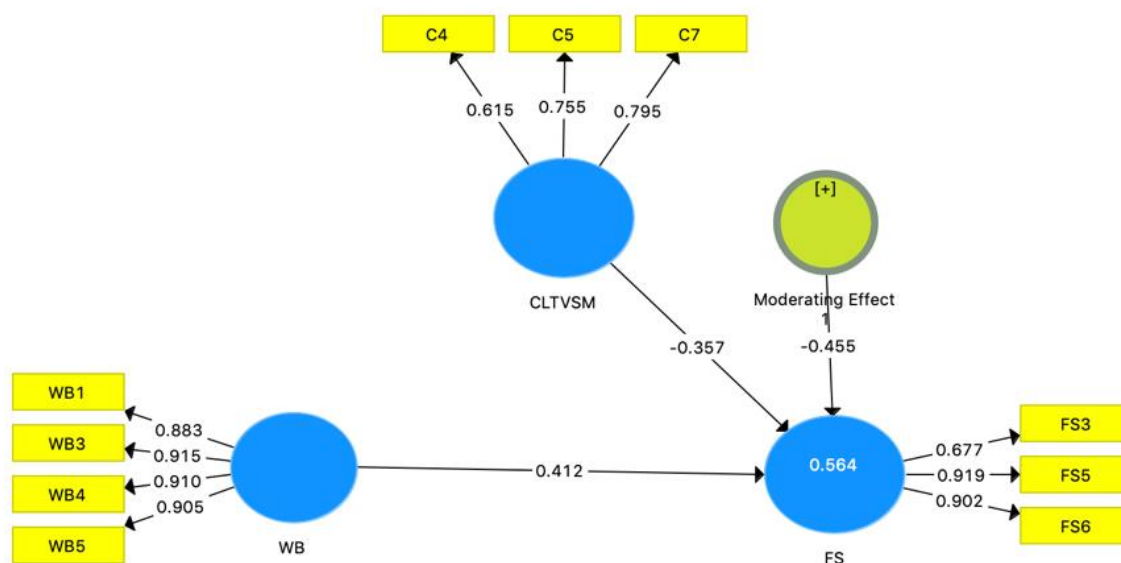


Figure 2 - Path analysis of the model

Note – compiled by authors

To assess the measurement reliability, Cronbach's Alpha coefficient was computed for each variable. The values for all variables fall within the range of 0.601 to 0.926. However, only one construct (Collectivism) falls below the minimum threshold of 0.7. Well-being and food security, on the other hand, exhibit results exceeding the minimum threshold, as indicated in Table 3.

Table 3 – Main coefficients of the construct

	Cronbach’s Alpha	rho_A	Composite Reliability	Average Variance Extracted
Collectivism	0.601	0.611	0.768	0.527
Food Security	0.784	0.821	0.876	0.706
Moderating Effect	1.000	1.000	1.000	1.000
Well-Being	0.926	0.939	0.947	0.816

Note – compiled by authors by using SmartPLS

However, the average variance extracted (AVE) surpasses the threshold of 0.5, confirming convergent validity (refer to Table 3). Furthermore, to ensure discriminant validity, the AVE square root should exceed the correlation between variables. Table 4 illustrates that discriminant validity has been achieved.

Table 4 – Testing to show discriminant validity

	Collectivism	Food Security	Moderating Effect	Well-Being
Collectivism	0.726			
Food Security	-0.508	0.840		
Moderating Effect	0.217	-0.482	1.000	
Well-Being	-0.117	0.373	0.171	0.904

Note – compiled by authors by using SmartPLS

After confirming validity, the author proceeded to test hypotheses. Bootstrapping calculations were employed with 5000 subsamples to assess significance. The significance level is depicted in Figure 3.

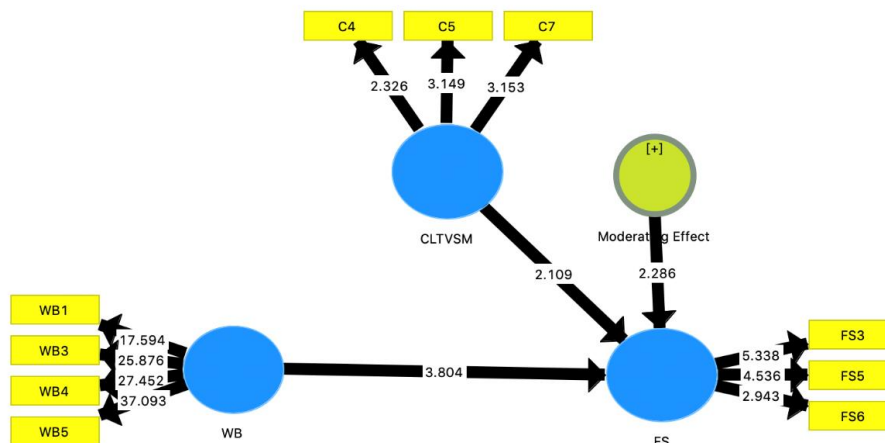


Figure 3 - Significance level (Bootstrapping 5000)

Note – compiled by authors

The findings reveal that both Well-Being and Collectivism exert a noteworthy influence on Food Security. Regarding Hypothesis 1, the path coefficient is 0.412, with a t-statistic of 3.804 and a p-value of 0.000, indicating a significant impact. Additionally, the results indicate that Collectivism has a negative effect on Food Security (Hypothesis 2: path coefficient is -0.358, t-statistics is 2.109, and p-value is 0.035). Both hypotheses are fully supported (Table 5).

Table 5 - Significance level report

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
Collectivism -> Food Security	-0.358	-0.311	0.170	2.109	0.035
Moderating Effect	-0.456	-0.412	0.200	2.386	0.022
Well-Being ->Food Security	0.412	0.406	0.108	3.804	0.000

Note – compiled by authors by using SmartPLS

Conclusion

Several constraints should be acknowledged. In the qualitative phase, the use of snowball sampling at a single college with a sample size of only 35 students restricts the generalizability of the results. Furthermore, there is a need to expand the number of questions or introduce additional factors with questions, as data saturation might occur rapidly.

In the quantitative analysis, the research scope is confined to the context of Almaty. Additionally, the survey questions were translated solely into Kazakh, which may lead to potential misunderstandings among respondents who are more proficient in Russian.

In summary, the results affirmed both hypotheses. The findings from the study provide evidence of the adverse influence of collectivism on the relationship between food security and well-being among students in Almaty city. This challenge is perceived by the government, universities, and parents as an issue of equity.

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Алматы қаласындағы студенттердің азық қауіпсіздігі мен әл-ауқатының сапалық және сандық зерттеуі

Аңдатпа. Бұл жұмыстың негізгі мақсаты Алматыдағы университет студенттері арасында ұжымшылдық, әл-ауқат пен азық-түлік қауіпсіздігіне қалай әсер ететінін зерттеу.

Сапалы тереңдетілген сұхбатқа 35 колледж студенті таңдалды. Сандық талдау үшін 2023 жылдың көктемгі семестрінде маңыздылығын, негізділігін және сенімділігін тексеру үшін осы зерттеуге 5 университеттен 244 бакалавриат, магистратура және PhD докторанттары қатысты.

Авторлар аралас әдісті қолданған. Алдымен әдебиеттегі сұрақтар негізінде сапалы терең сұхбат алынды. Содан кейін азық-түлік қауіпсіздігін өлшеу үшін USDA 6-тармақтан тұратын азық-түлік қауіпсіздігі модулінің сауалнамасы пайдаланылды. Дүниежүзілік денсаулық сақтау ұйымының бес факторлық әл-ауқат индексі студенттердің әл-ауқатын өлшеу үшін қолданылады. Ұжымшылдықты өлшеу үшін 14 пункттен тұратын Коммуналдық бағдар шкаласы (COS) қолданылды.

Халықтың әл-ауқатының азық-түлік қауіпсіздігіне оң әсері және олардың маңыздылығы жоғары екені анықталды. Ұжымшылдық олардың қарым-қатынасына кері әсерін тигізсе де, үлкен мәнге ие.

Түйін сөздер: Азық-түлік қауіпсіздігі, әл-ауқат, ұжымшылдық, сапалық талдау, сандық талдау

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Качественное и количественное исследование взаимосвязи продовольственной безопасности и благополучия студентов города Алматы

Аннотация. Основная цель данной статьи – изучить, как коллективизм среди студентов университетов Алматы может повлиять на благосостояние и отсутствие продовольственной безопасности.

Для качественного глубинного интервью было отобрано 35 студентов колледжа. Для количественного анализа выборка состояла из 244 студентов бакалавриата, магистратуры и докторантуры из 5 университетов, чтобы проверить значимость, достоверность и надежность.

Авторы использовали смешанный метод. Во-первых, было проведено качественное глубинное интервью с вопросами, основанными на литературных данных. Затем для измерения отсутствия продовольственной безопасности было использовано обследование по модулю продовольственной безопасности Министерства сельского хозяйства США, состоящее из 6 пунктов. Пятифакторный индекс благополучия Всемирной организации здравоохранения используется для измерения благополучия студентов. Для измерения коллективизма использовалась шкала общинной ориентации (COS) из 14 пунктов.

Установлено, что благополучие положительно влияет на продовольственную безопасность и их значимость высока. В то время как коллективизм отрицательно влияет на их отношения с высокой значимостью.

Ключевые слова: продовольственная безопасность, благополучие, коллективизм, качественный анализ, количественный анализ.

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