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КАК ПРОДОВОЛЬСТВЕННАЯ БЕЗОПАСНОСТЬ ВЛИЯЕТ НА БЛАГОПОЛУЧИЕ: МОДЕРАТИВНО- МЕДИАЦИОННАЯ МОДЕЛЬ

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Аннотация. В этой статье мы подчеркиваем важность входных и процессно-ориентированных подходов, исследуя медиаторскую роль поведенческих намерений во взаимосвязи между продовольственной безопасностью и благополучием, а также модераторскую роль знаний о здоровом питании и коллективизма.

Авторы использовали количественный метод анализа. Для измерения продовольственной безопасности использовался модуль USDA состоящий из 6-пунктов. Для оценки благополучия студентов использовался пятифакторный индекс, рекомендованный Всемирной организацией здравоохранения. Для измерения коллективизма использовался 14-элементный COS-модуль. В то время как знания о здоровом питании измерялись методом Флинна и Голдсмита, а поведенческое намерение – методом Цайтхамла.

Авторы обнаружили факторы, которые могут повлиять на продовольственную безопасность, а затем провели количественный опрос среди 7 крупных университетов города Алматы.

Было обнаружено, что продовольственная безопасность положительно влияет на благополучие и поведенческие установки, их значимость высока. Также коллективизм положительно влияет на их отношения с высокой значимостью.

***Ключевые слова:** продовольственная безопасность, благополучие, поведенческое намерение, знания о здоровом питании, коллективизм.*

АЗЫҚ-ТҮЛІК ҚАУІПСІЗДІГІ ӘЛ-АУҚАТҚА ҚАЛАЙ ӘСЕР ЕТЕДІ: МОДЕРАЦИЯЛАНҒАН МЕДИАЦИЯЛЫҚ МОДЕЛЬ

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Аңдатпа. Бұл жұмыста біз азық-түлік қауіпсіздігі мен әл-ауқат арасындағы байланыстың мінез-құлық ниеттерінің медиаторлық рөлін және салауатты тамақтану туралы білім мен ұжымшылдықтың модераторлық рөлін зерттей отырып, осы процеске негізделген тәсілдердің маңыздылығын атап өтеміз.

Авторлар сандық зерттеу әдісін қолданды. Азық-түлік қауіпсіздігін өлшеу үшін USDA 6-тармақтан тұратын модулі қолданылды. Дүниежүзілік денсаулық сақтау ұйымы ұсынған студенттердің әл-ауқатын өлшеу үшін бес факторлық индекс қаралды. Ұжымшылдықты өлшеу үшін 14 элементтен тұратын COS модулі қолданылды. Салауатты тамақ туралы білімді Флинн мен Голдсмит әдісі және мінез-құлық ниеті Цейтамл әдісі арқылы өлшенді.

Авторлар әл-ауқатқа әсер етуі мүмкін факторларды тауып, содан кейін Алматы қаласының 7 ірі университеттерінде сандық сауалнама жүргізді.

Әл-ауқатқа азық-түлік қауіпсіздігі оң әсер ететіндігі және олардың маңызы жоғары екендігі анықталды. Сондай-ақ, ұжымшылдық олардың арақатынасына оң әсер ететіні анықталды.

Түйінді сөздер: азық-түлік қауіпсіздігі, әл-ауқат, салауатты тамақтану туралы білім, мінез-құлық ниеті, ұжымшылдық.

HOW FOOD SECURITY INFLUENCE WELL-BEING: A MODERATED MEDIATION MODEL

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Abstract. In this paper we stress the importance of input and process based approaches by examining the mediating role of behavioral intention on the relationship between Food security and Well-Being, and moderating role of healthy food knowledge and collectivism.

Authors used quantitative method. 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. While Healthy food knowledge were measured by Flynn and Goldsmith 7 likert method and Behavioral Intention measured by Zeithaml method.

Authors found factors which may affect well-being and then made a quantitative survey among 7 major universities in Almaty city.

It was found that food security positively effect on well-being and behavioral intention, their significance is high. Also, collectivism positively impact on their relation with high significance.

Keywords: *Food security, well-being, healthy food knowledge, behavioral intention, collectivism.*

Introduction

Latest data illustrates that one in nine people (which is more than 820 people) around the world are hungry in 2018 [1]. To decrease this number many initiatives are supported in creating food security conceptualization. Food security exists when all four pillars, which are availability, accessibility, utilization and stability of food, is respected [2]. If one of these components are missed, then it may lead to negative impact on human development and a population's health.

The most undernourishment districts are Africa and Asia. Latest data shows the affirmative trends in reducing the prevalence of undernutrition, nevertheless these numbers are too big [2]. Moreover, according to USDA, Kazakhstan took 96th place out of 104 countries in food expenditure ranking with 44,9 percent [3]. The most food insecure countries like Cambodia, Ghana, Guatemala are on higher position than Kazakhstan. It should be mentioned that, if country is developed and rich, then they spend less on food expenditure. For example, USA spend 6,4 percent, UK – 8,1 percent, etc. Internal data shows that on 3rd quartile 2019 Kazakhstan's household spending was 569,6 thousand tenge (\$1300) on average, while 284,3 thousand tenge (\$660) from them was spend on food expenditure which is 49,9 percent [3]. In the second quarter of 2020, household cash expenditures increased to 4.2%. Average amount of money for each family for food expenditure now equal to 301.1 thousand tenge (\$715) which is 53.2% of their spends [3]. Most of these money were spend

on meat (35,4 percent), bakery products (14,2 percent), dairy (9,9 percent), fruit (8,5 percent), sugar, confectionery and sweets (7,5 percent) [3]. However, it should be mentioned that the average per-capita consumption of vegetables dropped down from 85 kilograms in 2000 to 19.1 kilograms in 2017 [3].

Also, it should be said that price of these products increases yearly. Thus, living wage in Kazakhstan equal to 32 668 tenge (\$75) [4]. Living wage is the sum which will be spend for first need products. Nevertheless, college students scholarship is equal to 20 948 tenge (\$48) which is lower than living wage [5]. Moreover, lifestyle and eating habits are the main factors which affects on the gastritis appearance. 10% of all death in the first quarter of 2020 related to digestive diseases and 7.7% from poisoning. Moreover, childhood obesity in our country equal to 19.1% and 55.6% of adults are overweight and 23.7% of them are obese [6]. According to WHO, excess weight lead to early death, nearly three million people die every year because of that [6]. College and university students play important role in this research, because they meet transition effect when they move from their region to big city like Almaty.

Nearly half a million (496 209) student studies in Kazakhstan and 41% (202 901) of them are come from different cities or regions. Moreover, 131 292 of students study in Almaty [7]. As it was written in independent news portal azattyq, all universities in Almaty city do not have enough places in their dormitories for students [8].

Students in Almaty usually from other parts of the country, and less of them have an opportunity to live in dormitories. Moreover, it should be mentioned that living cost in Almaty is higher than in other regions of Kazakhstan and it growth yearly. For example, in 2016 rental cost for dormitory increased 3 times than in 2015 [7]. That is why it is difficult for students to live in the big city and get access to save and nutritious food, even if they have scholarship.

Young people face the problem of choosing nutrition food during this transition effect. That is why, healthy food knowledge is the most valuable factor which may affect to their choice and eating habits.

Literature Review

Food security

Food security was defined as “-all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” [9]. It has four main pillars like availability, access, utilization and stability [10].

Availability means physical existence of sufficient, quality and various food. It is a mixture of local food production, commercial food imports and exports, food aid and domestic stocks on a national level [10].

Accessibility exist when all households have financial resources to obtain food for their dietary needs. It is also happened when there is bad infrastructure, limited access to the railways and roads [10].

Utilization relates to the person ability to take diversity foods and be able to convert it [10].

Stability means food security condition over time. This can be affected by natural disaster, political conflicts, price volatility and etc. [10].

Several studies show that from 14 to 72 percent of college and university students are food insecure. Food insecurity lead to physical and mental health problems like poor self-reported health, poor diet quality, obesity, diabetes, depression, anxiety and gastritis. Also, food insecure students face depressive symptoms and low academic performance. Additionally, more than 17% of deaths in Kazakhstan in 2020 first quarter were from poisoning and digestive diseases [11].

Food insecurity scale of students was documented in 2008 (the Great Recession), then they supposed that students expenditure to education, books, transportation, poor financial aid affects on their basic needs like housing and food. Moreover, nobody denies that tuition fee increases yearly in our country. Additionally, other thing which is related to study process like notebooks, house renting, communal expenditures are significant issue for students [11]. In coping with food insecurity university students use strategies like not buying course related things, changing their eating habits, overworking, etc. Finally, one research shows that do not having financial knowledge skills lead to being food insecure among university students.

Previous studies illustrates that there is an inverse relation among food insecurity and quality of diet, academic performance and mental/physical health. They reported that food insecure students are the students who have poor eating habits, limited access to eat fruits, vegetables, grains, also, they have bad health and low academic performance [11]. That is why it is important to solve a problem of being food insecure, because it may affect on students physical/mental health and their academic performance.

According to Bruening, string relation between well-being and food insecurity exist among general population [12]. Moreover, it was proven that inadequate sleep are common in food insecure adults. On this paper, author see narrowly and consider students. Because, students suffer more than others in transition period from school to university when they face independence in choosing healthy food by the first time.

H1: Food security positively affect to well-being

H2: Food security positively affect to behavioral intention

Behavioral intention

Theory of Planned Behavior (TPB) is social psychology which consist three major parts such as attitude toward behavior, perceived behavior control and subjective norms. All of them the part of behavior intention, however we consider only attitude toward behavior, because its in our framework and answer to our requests like “is it good or bad?”. It shows outcomes which relate to person preferences to choose or recommend service or product to others. In our context, it was reported that knowledge may affect to behavioral intention. However, how it may affect to well-being?

H3: Behavioral intention positively affect to well-being

Healthy food knowledge

According to Knowledge-creating theory, subjective components should be used to make an research rather than objective. It means that person is an object who can achieve knowledge which are independent. Earliest research illustrates that varied factors can affect to students' food choices. Especially knowledge was known as a crucial factor which may directly affect to eating habits. Previous studies confirmed the importance of customer knowledge in choosing. Young people who see and read food attitudes are inclined to choose better nutritional food. Because of this, healthy food knowledge can be one of the most important factors which may influence to students choice and eating habits. Previous works considered the direct effects of this factor, but authors of this study consider moderating effect [13].

H4: Healthy food knowledge positively moderate the relationship between food security and behavioral intention

Collectivism

We explain the interaction among collectivism and food insecurity/well-being by the lens of cultural mindset theory. This theory says that situational and dynamic modes of cognition activates when chronic orientation is made salient. Collectivism turn on a mindset that depend on holistic thinking which is lead to upper perceptions of interconnectedness between yourself and other people. Collectivism shows the level of how person see himself/herself in their social groups. Additionally, they relate themselves to others as part of group. Also, there exist opposite side of it, and some persons make less attention on their surrounding [14].

Latest studies which is considering interaction between food insecurity and well-being considered how homelessness and academic performance affects on them. However, these significant can be differ because they did not check well-being and food security for validity and reliability, and we analysis this effect by including collectivism as moderating variable. That is why author fill this gap in literature, moreover consider how collectivism affect on interaction between food security and well-being.

H5: Collectivism positively moderate relation between food security and well-being

Research methods

Quantitative method of analysis were used on this study. Firstly, authors create a questionnaire by systematic literature review, then start to collecting data via survey. After that they interpret descriptive statistics, finally, wrote about quantitative method and shows results.

Quantitative analysis

Totally 170 students of seven major universities of the city were selected for the survey by snowball sampling in Almaty. First of all, Almaty is main research

hub in Kazakhstan. Almaty is the biggest city in Kazakhstan and as it was written before one-fourth of all students in Kazakhstan studies in this city. Moreover, most of them suffer from living cost that is why significant of collectivism could be high [8].

Because of COVID-19 and quarantine regime in Almaty city data were collected by mail and WhatsApp. Questionnaires relating to their demographic status, food security, behavioral intention, healthy food knowledge, well-being and collectivism were translated into Kazakh and Russian languages and sent to their mails, some of them decided to fill the survey via WhatsApp. All students completion were voluntary and they were informed of confidentiality.

More than 170 questionnaires were sent to students and 170 of questionnaires returned, 14 of them were excluded because of data incompleteness and missing data. A total sum of participants is 156, 59 of them males, 97 of them females. Mean age of the participants is 19,32 (SD=1,511) with a range of 18-22 years old. 19 of them are on 4th course, another 27 students from third course, most of them on the 2nd course (69), and 41 of them on 1st course. Most of them has a scholarship. 88% percent of them not a citizens of Almaty, 52% of them rent a flat, others live in dorm or with parents.

Measure

Healthy food knowledge was measured by the questions developed by Flynn and Goldsmith (1999) [15]. It consists four questions with 7 Likert scale from strongly disagree to strongly agree.

According to Zeithaml et al. (1996), behavioral intention can be measured by 13-item which is divided to four categories such as complaining behavior, price sensitivity, purchase intentions and word-of-mouth communications [16].

Food security were measured by 6-item short form of US Household Food Security Survey module which include six questions relating to ability to allow balanced meal, having financial opportunity to buy food, cutting meal size or eating less, being hungry because of lack of money. 0-1 answer would be negative means food secure, 2-4 negative answers means low food secure, 5-6 means very low food security [17].

Survey question to measure well-being were taken by The World Health Organization Five Factor Well-Being Index which consist 5 questions and 6 likert type variants from “at no time” to “all the time”. Each variant have score from 1 to 6, the higher the score, the higher well-being of student. These questions help to find how often they faced good mood, calm etc. in last 14 days [6].

Collectivism is measuring by Communal Orientation Scale (COS) which is 14-item 7-point Likert scale, these items were rated like 1-extremely uncharacteristic of me to 7-extremely characteristic of me. It includes questions like “It bother me when other people neglect my needs; When making a decision, I take other people’s needs and feelings into account and etc.” [18].

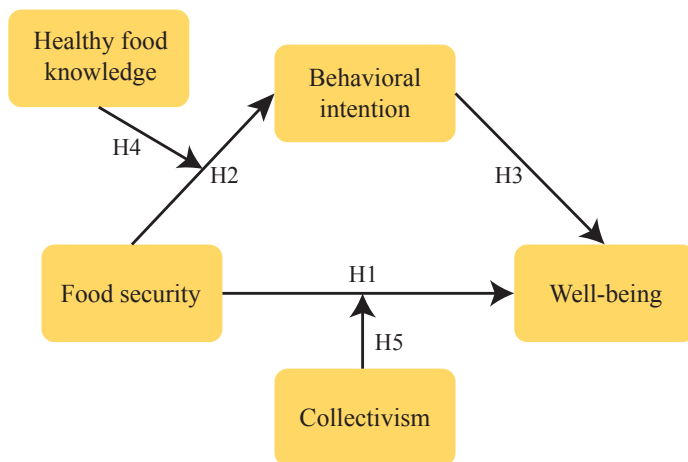


Figure 1. Research model

Note: compiled by authors based on results of the research

For the statistical analysis author used Excel for data preparation (then converted it to csv) and SmartPLS (Partial Least Squares) were used for data analysis to check significant, validity and reliability. Mean values were used to report students demographic status, food security status, healthy food knowledge, behavior intention, well-being and collectivism. Then research model were developed to estimate the relationship among them (Fig. 1). The dependent variable was well-being, the independent variable is food security and behavior intention. Collectivism and healthy food knowledge are moderating variables.

Research results and discussion

Quantitative analysis results

First of all, author run the model with all data. Then dropped question which is not representatively measure our variables. Question coefficient which is less than 0,6 were excluded. 4 out of 5 question may represent Well-Being and 2 out of 6 question can illustrate food security, also, 7 out of 14 questions can measure behavior intention, while 2 out of 4 may represent healthy food knowledge and only 3 out of 14 question may used to measure collectivism (fig. 2).

To check the measurement of reliability, Cronbach's Alpha coefficient was calculated for each variable. The range of all variables are between 0,706 and 0,903, all constructs are higher than the minimum threshold of 0,7. (table 1).

Table 1. Main coefficients of the construct

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Behavioral Intention (BI)	0.903	0.925	0.926	0.677

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Collectivism (CLTVSM)	0.706	0.703	0.834	0.627
Food Security (FS)	0.723	1.065	0.863	0.761
Healthy Food Knowledge (HFK)	0.822	0.832	0.918	0.848
Well-Being (WB)	0.744	0.783	0.831	0.555

Note: compiled by authors based on results of the research

Nevertheless, all indicator's average variance extracted (AVE) are above the threshold which equal to 0,5 to establish convergent validity (table 3). Moreover, to be sure, discriminant validity of the AVE under square should be more than correlation of the variables what was proved.

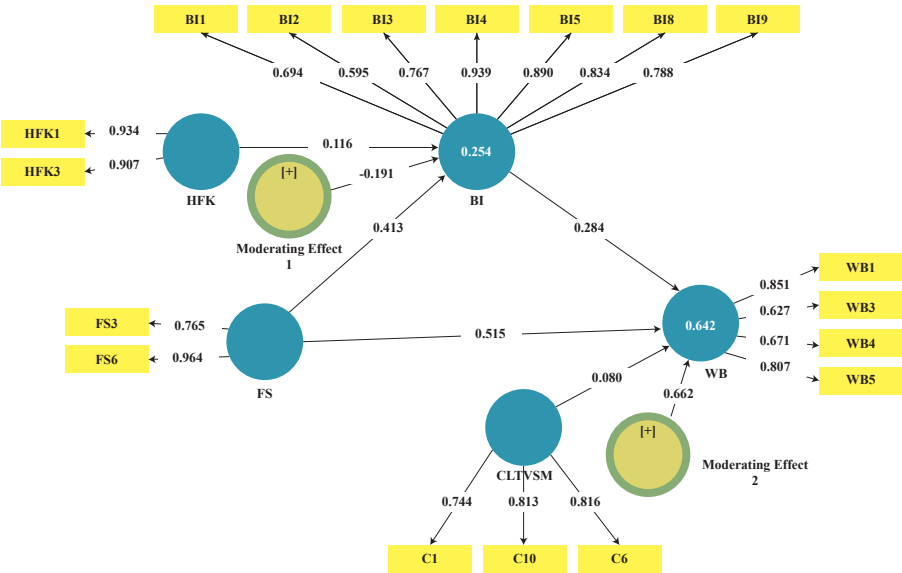


Figure 2. Path analysis of the model

Note: compiled by authors based on results of the research

Finally, after checking validity, author started testing hypothesis. Bootstrapping calculation used with 5000 subsamples to see significance. The results shows that Food security has a significant impact on Behavior intention and Well-being. For the hypothesis 1 and 2: path coefficients are 0,413 and 0,515 respectively; t-statistics are 5,379 and 2,732 for each. Moreover, p-value is equal to 0,000 for both hypothesis 1 and 2. The third hypothesis was rejected because the p-value is too high and equal to 0,250. The same results were given to the fourth hypothesis which was also rejected with a high p-value. However, the last hypothesis outcomes reports

that Collectivism has positive effect on Well-being (Hypothesis 5: path coefficient is 0,662, t-statistics is 3,849 and p-value is equal to 0,000). Three hypothesis out of five are fully supported (Table 2).

Table 2. Significance level report

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
BI -> WB	0.152	0.158	0.132	1.151	0.250
CLTVSM -> WB	-0.461	-0.453	0.120	3.849	0.000
FS -> BI	0.468	0.473	0.087	5.379	0.000
FS -> WB	0.300	0.299	0.110	2.732	0.000
HFK -> BI	0.151	0.159	0.128	1.176	0.240
Note: compiled by authors based on results of the research					

Conclusion

In conclusion, three hypothesis were supported by outcomes. Authors findings shows evidence of how collectivism positively impact on well-being and food security relation among students in Almaty city. Also, it was found how Food security can affect both well-being and behavior intention.

Based on the findings of the research, the following recommendations should be considered. For the future research it is recommended to increase the scope of the research by including additional city like Nur-Sultan. Additionally, gender diversity should be taken into account in the future. Finally, p-value coefficient were high for two relations, which have to be considered in the future research by making qualitative in-depth interview to find the answer and probably new factor may appeared through this interviews.

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