



# Assessment of the Quality of Life and Living Conditions of the Rural Population of the Kazakhstan during the COVID-19 Pandemic

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## Abstract

**BACKGROUND:** Low availability of medical care and low level of comfort living in rural areas, underdeveloped infrastructure, and difficult working conditions lead to the deterioration of health of rural residents. Rural areas are characterized by less comfortable living conditions than in the city, which can affect health-related quality of life.

**AIM:** The purpose of this study was to assess the satisfaction of the population with the quality of life in rural areas as well as to study the quality of life of the rural population of the Republic of Kazakhstan related to health.

**METHODS:** This study was a one-stage cross-sectional study. Online questionnaire was asked by 411 local residents, of which only 302 were suitable for processing.

**RESULTS:** The results showed that almost a third of the respondents are unemployed (27.2%). In the course of the survey, respondents could subjectively assess their own health, for example, almost a third of respondents (35.76%) assess their health as “poor” and “below average.” At the same time, 18.21% of respondents are not satisfied with the quality of medical services provided in rural areas. The coefficients of correlation between the desire to move to the city and age, income level, family composition, marital status, and type of housing were established. The universal social functioning-36 index was 0.6 ( $\pm 0.02$ ) for women and 0.55 ( $\pm 0.033$ ) for men

**CONCLUSIONS:** We can say that the quality of life of the rural population remains quite low. This is evidenced by low income, high unemployment, and the problem of drinking water. Quarantine measures related to COVID-19 also had an impact on the increase in unemployment, however, during the quarantine, there is a deterioration in mental health indicators among men compared to women. The results of the study confirmed that the issue of accessibility of medical services remains very urgent for rural residents.

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## Introduction

In the Alma-Ata Declaration of the World Health Organization (WHO) adopted in 1978, primary health care (PHC) was defined as the main platform providing universal access to basic health services, as well as “point of first contact” of patients with the health system [1]. Confirming the importance and relevance of the Alma-Ata Declaration, the Astana Declaration was adopted in 2018, which approved new ways of developing PHC worldwide [2]. It is increasingly recognized that achieving the sustainable development goals related to health, including universal access to health care, is impossible without strong PHC systems [3]. Despite the fact that the first foundations for the development of PHC were laid more than 40 years ago, progress over these four decades has been uneven. According to the Declaration of Alma-Ata, ensuring adequate access to PHC services is vital for governments and health authorities in most countries [4].

Because of its user-centricity, PHC is the gateway to other levels of care. It is important that health planners minimize barriers to access to the provision of PHC services, as geographic access remains a key determinant of the use of health services when needed [5], [6]. At least half of the world’s population lacks access to basic health services. In many countries, there are significant inequalities in health status between people living in rural and remote areas and people living in large cities [7]. Increasing the availability of medical care is especially important for the rural population living in remote and hard-to-reach areas [8].

The coronavirus pandemic has become a real test for the health-care system around the world, in which the effectiveness, accessibility, and equity of health-care systems at the global level were assessed.

The outbreak of the new severe acute respiratory syndrome coronavirus (SARS-CoV-2) has been declared by the WHO as a major pandemic

worldwide [9]. The coronavirus pandemic has particularly affected rural residents in terms of socioeconomic status and health status, both physical and mental.

Undoubtedly, such factors as limited access to health services, poor quality of health care, poor funding, limited doctors, lower socioeconomic resources in rural areas, and the level of literacy, especially health literacy, played a significant role in the increase in the incidence rate among the rural population [10], [11].

Numerous modern medical studies show that good health is directly related to a standard of living, a sense of well-being, and an increase in social and economic status. Factors directly affecting the state of human health are age, conditions, level and way of life, presence and composition of a family, number of children, level of education, availability of work, level of well-being, living conditions, sense of security, availability, and quality of medical care [12], [13].

The definition of quality of life from a medical point of view is given by the WHO. The WHO defines the concept of “quality of life” as the perception of individuals of their position in life in the context of the culture and value systems in which they live, and in connection with their own goals, expectations, standards, and concerns [14]. Quality of life is considered a multidimensional concept and is assessed taking into account its physiological, psychological, and social aspects [15].

A recent systematic review found that only one study examined the relationship between rural life and population quality of life, with rural living conditions identified as an independent negative predictor of health-related quality of life (HRQOL). For example, according to a study conducted in Croatia, people living in rural communities were more likely to experience a poor quality of life compared to their urban peers. The negative relationship between rural life and quality of life in high-quality settings may be related to inadequate access to health services. Compared to the city, the main disadvantages the quality of life in rural areas are poor access to prestigious and a well-paid job and a richer social life [16], [17], [18].

Despite the fact that the rural population accounts for over 3 billion of the world’s population, the standard of living of the rural population is significantly lower than that of the urban population, which correlates with poor health indicators [19]. Thus, rural areas are characterized by higher unemployment and low-income levels, as well as low levels of education and more difficult and unfair access to health and social services [20]. Differences in health indicators between rural and urban residents can be caused by the above factors. Furthermore, rural residents, compared to the urban population, tend to have worse physical and mental health (MH) indicators, a higher prevalence of chronic diseases, and a higher mortality rate [21]. However, this issue is poorly studied and information on this issue remains very scarce.

Therefore, this study aimed to assess the quality of life of the rural population of the Republic of Kazakhstan related to health, applying a one-stage cross-sectional method.

## Method

### *Samples and design*

This study was a one-stage cross-sectional study. The study was conducted in Republic of Kazakhstan using data from the original questionnaire designed to study the quality of life of the rural population, also data from the standardized questionnaire social functioning (SF-36). A one-stage cross-sectional study in an online format was conducted from March 2020 to April 2020 during the COVID-19 quarantine measures. The online survey was the most realistic way to access the target population, while maintaining social distance. The link to the online survey was distributed through various online communication channels, including email and social media platforms (WhatsApp). Inclusion criteria were rural population, over 18 years of age, and ability to self-complete the online survey. The online survey was conducted in two regions of Kazakhstan – Akmola region and Turkestan. The sampling was carried out by the method of simple random sampling. At the beginning, lists of residents of these settlements were requested with the definition of their address of residence, after a random number generator, a list of household addresses was determined, according to our sample.

We selected two villages and 350 households from each, for a total of 700 respondents, with the calculation of one respondent from one household. For various reasons, we were able to send 518 questionnaires through the internet platforms and messengers, of which we received only 411 responses back. The questionnaires of 302 respondents were processable. One hundred and nine questionnaires were not included in the analysis and processing due to the fact that the answers were incorrect or incomplete. This number of samples with a confidence interval (CI) of 95% is representative, which allows the results to be considered reliable.

### *Instrument*

A questionnaire for studying the quality of life adapted to local conditions was developed at the Department of Public Health and Management and was approved by the Local Bioethics Committee of Astana Medical University, Nur-Sultan, Kazakhstan (protocol №4, February 20, 2020). The study was conducted in accordance with the principles of the Declaration of Helsinki.

The questionnaire consists of three blocks: Block 1 consists of sociodemographic characteristics of respondents, block 2 – respondents' satisfaction with living conditions, and block 3 questions concerned the availability and quality of medical services. Further, this study used the standardized SF-36 questionnaire to assess the physical and MH of the rural population. The SF-36 consists of 36 questions grouped into eight health state scales: Physical functioning, role physical, body pain (BP), general health, vitality, SF, emotional role (RE), MH, and health transition (HT) report. These state scales are combined into two composite scales, the physical and MH scales. To assess the reliability of the research results, the internal consistency and reliability of the applied criteria were checked based on the Cronbach's alpha test, which was 0.7159, which indicates high reliability.

### Data analysis

Data are represented by mean values with standard deviation (SD) and percentages. For the relationship of factors in the normal distribution of the sample, Student's paired t-test was calculated as well as a multivariate analysis of variance. In case of non-normal distribution, the data were represented by median (25% and 75% quartiles), statistical significance was determined using non-parametric statistics, the method of regression analysis between variables was also used.

## Results

The total number of respondents was 302 (n = 302). In terms of gender, female respondents n = 177 (58.6%) and married respondents n = 259 (85.76%) prevailed (26.16%) in the age group of 30–39 years. The mean age of respondents was 36 years (Me) (Q1 30 [CI 28–32]; Q3 44 [CI 44–52]).

The majority of respondents have higher education (48.68%) and specialized secondary education (33.11%), some respondents have incomplete higher education (11.92%), and less than 5.63% of respondents have general secondary education and 0.66% have postgraduate education (master degree).

According to the survey, more than half of the respondents (62.58%) have their own housing. About 52% (n = 157) of respondents have 5–8 people in their families, 61% (n = 185) of respondents have lived in the said rural area for 10–15 years. Detailed data on the sociodemographic characteristics of the respondents are presented in Table 1.

It is important to note that almost one-third of the respondents are unemployed (27.2%), 54.9% of the respondents are employed in the public sector and public service, 19% are private entrepreneurs. In the

**Table 1: Sociodemographic characteristics of respondents (n = 302)**

Characteristics	Total (n = 302), n (%)	Man (n = 125), n (%)	Woman (n = 177), n (%)
Age category			
18–29	44 (14.57)	18 (40.91)	26 (59.09)
30–39	79 (26.16)	29 (36.71)	50 (63.29)
40–49	65 (21.52)	28 (43.08)	37 (56.92)
50–59	53 (17.55)	24 (45.28)	29 (54.72)
60–69	44 (14.57)	20 (45.45)	24 (54.55)
70 and older	17 (5.63)	6 (35.29)	11 (64.71)
Family status			
Unmarried	43 (14.24)	20 (46.51)	23 (53.49)
Married	259 (85.76)	105 (40.54)	154 (59.46)
Education			
General secondary education	17 (5.63)	9 (52.94)	8 (47.06)
Postsecondary education	100 (33.11)	48 (48)	52 (52)
Incomplete higher education	36 (11.92)	19 (52.78)	17 (47.22)
Higher education	147 (48.68)	49 (33.33)	98 (66.67)
Postgraduate education	2 (0.66)	0	2 (100)
Type of housing			
Own	189 (62.58)	75 (39.68)	114 (60.32)
Temporary (from the employer)	40 (13.25)	19 (47.5)	21 (52.5)
Live with relatives	24 (7.95)	9 (37.5)	15 (62.5)
Rental housing	49 (16.23)	22 (44.9)	27 (55.10)
Income level (US dollars)			
\$50–120	46 (15.23)	27 (58.7)	19 (41.30)
\$120–240	105 (34.77)	33 (31.43)	72 (68.57)
\$240–480	90 (29.8)	42 (46.67)	48 (53.33)
Over 500	61 (20.2)	23 (37.7)	38 (62.3)

course of the survey, monthly income of the villagers was also determined, as a result it was determined that more than one-third (34.77%) of the whole sample has an average monthly income from \$120 (US dollars) to \$240 (US dollars). The age characteristics of the respondents according to sociodemographic indicators are presented in Table 2.

During the survey, respondents could subjectively assess their own health, so almost a third of respondents (35.76%) assessed their health as "poor" and "below average." At the same time, 18.21% of respondents are not satisfied with the quality of medical services in rural areas. About 35.90% of respondents are not satisfied with public transport, half of the respondents (50.43%) are not satisfied with the state social programs. Satisfaction with working conditions was 52.14%, while 47.86% of respondents are not satisfied with working conditions. Furthermore, during the survey, it was revealed that 39.74% of respondents want to move to urban areas and among the main reasons for relocation indicate – unemployment (30%) and poor quality of life (27%), as well as poor quality or low availability of medical services (15%).

Correlation analysis between age and health showed an inverse average relationship and the correlation coefficient was  $-0.6$ , which says, and the correlation coefficient between the variables age and desire to move to the city was  $0.2$ , which shows a direct weak relationship. In addition, regression analysis determined the relationship between the desire to move to the city and family composition, the regression coefficient was  $-0.13$ ,  $p = 0.041$  (CI 95%).

An important aspect was to determine the accessibility of medical services for the rural population. Thus, part of the respondents (n=55, 18.21%) evaluated the quality of medical services

**Table 2: Sociodemographic characteristics of respondents by age category (n = 302)**

Characteristics	Total	Age categories					
	Absolute number, n (%)	18–29, n (%)	30–39, n (%)	40–49, n (%)	50–59, n (%)	60–69, n (%)	70+, n (%)
Sex							
Men	125 (41.2)	18 (40.91)	29 (36.71)	28 (43.08)	24 (45.28)	20 (45.45)	6 (35.29)
Women	177 (58.6)	26 (59.09)	50 (63.29)	37 (56.92)	29 (54.72)	24 (54.55)	11 (64.71)
Family status							
Unmarried	43 (14.24)	26 (8.6)	8 (2.6)	0	1 (0.3)	4 (1.3)	4 (1.3)
Married	259 (85.76)	18 (6.0)	71 (23.5)	65 (21.5)	52 (17.2)	40 (13.2)	13 (4.3)
Education							
General secondary education	17 (5.63)	2 (0.7)	2 (0.7)	4 (1.3)	2 (0.7)	0	7 (2.3)
Postsecondary education	100 (33.11)	9 (3.0)	26 (8.6)	24 (7.9)	22 (7.3)	15 (5.0)	4 (1.3)
Incomplete higher education	36 (11.92)	10 (3.3)	10 (3.3)	5 (1.7)	8 (2.6)	1 (0.3)	2 (0.7)
Higher education	147 (48.68)	23 (7.6)	40 (13.2)	31 (10.3)	21 (7.0)	28 (9.3)	4 (1.3)
Postgraduate education	2 (0.66)	0	1 (0.3)	1 (0.3)	0	0	0
Type of housing							
Own	189 (62.58)	15 (5.0)	45 (14.9)	39 (12.9)	35 (11.6)	38 (12.6)	17 (5.6)
Temporary (from the employer)	40 (13.25)	14 (4.6)	11 (3.6)	8 (2.6)	3 (1.0)	4 (1.3)	0
Live with relatives	24 (7.95)	11 (3.6)	8 (2.6)	3 (1.0)	2 (0.7)	0	0
Rental housing	49 (16.23)	4 (1.3)	15 (5.0)	15 (5.0)	13 (4.3)	2 (0.7)	0
Income level (US dollars)							
50–120	46 (15.23)	6 (2.0)	13 (4.3)	16 (5.3)	9 (3.0)	2 (0.7)	0
120–240	105 (34.77)	14 (4.6)	25 (8.3)	12 (4.0)	20 (6.6)	17 (5.6)	17 (5.6)
240–480	90 (29.8)	12 (4.0)	26 (8.6)	23 (7.6)	13 (4.3)	16 (5.3)	0
Over 500	61 (20.2)	12 (4.0)	15 (5.0)	14 (4.6)	11 (3.6)	9 (3.0)	0

as – “low.” The respondents’ answers regarding the territorial accessibility of medical institutions were distributed as follows: 63 (20.86%) indicated that they spend 5–10 min walking distance to medical facility, 88 (29.14%) respondents indicated that medical facility is located 10–20 min walking distance, 77 (25.5%) respondents spend 30 min–1 h walking distance, and 74 (24.50%) respondents spend 30 min–1 h walking distance to medical facility. More than one-third (39.41%) of respondents indicated that they wait 10–30 min for an ambulance to arrive, while 24.84% of respondents typically wait about an hour or more for an ambulance to arrive.

Correlation analysis also showed very weak links between satisfaction with living conditions and satisfaction with prices, satisfaction with medical services, distance to medical institutions, time of arrival of ambulance, work of public transport, and existing social programs to support the rural population (0.02–0.16).

Regression analysis found statistical significance of the coefficient of satisfaction with ambulance arrival time (–0.15),  $p = 0.017$  (CI 95%) which suggests that the arrival of the ambulance 10 min earlier increases satisfaction with living conditions by 0.15 points. Coefficients for other indicators were not statistically significant ( $p > 0.05$ ) (Table 3).

**Table 3: Results of regression analysis between satisfaction with living conditions in the countryside (n = 302)**

Characteristics	Coefficient	SD	t	p > t	95% CI
Satisfaction with the quality of medical services	–0.01820	0.04904	–0.37	0.711	–0.11472–0.07831
Ambulance arrival time	–0.06664	0.02782	–2.40	0.017	–0.12139–0.01189
Satisfaction with the availability and prices of goods	0.04615	0.06360	0.73	0.469	–0.07902–0.17133
Satisfaction with social programs	–0.01819	–0.01819	–0.30	0.763	–0.13689–0.10049
Satisfaction with public transportation	–0.12660	0.06586	–1.92	0.056	–0.25622–0.00300

Multivariate analysis of variance also showed statistical significance of indicators of satisfaction with living conditions depending on the level of

income ( $p = 0.03$ ), and lack of statistical significance depending on family composition, marital status, education, length of residence in the village, and type of housing. It was found that the correlation coefficients between the subjective assessment of the quality of life and age are –0.71, which characterizes the presence of a strong inverse relationship between these variables. Regression analysis showed statistical significance of the coefficient of the variable age (–0.118) at 95% confidence level ( $p = 0.008$ ), which indicates that an increase in age by 1 order (10 years) reduces the assessment of quality of life by 0.12 points.

Correlation coefficients were found between the desire to move to the city and age (0.47); income level (0.39); family composition (–0.117); marital status (0.24); and type of housing (–0.34).

Regression analysis confirmed the statistical significance of the coefficients for these variables (Table 4).

**Table 4: Results of regression analysis between the desire to move to the city and age, income, family composition, marital status, and type of housing, for respondents (n = 302)**

Variables	Regression coefficient	p
Age	0.26	0.000
Income level	0.34	0.000
Family composition	–0.14	0.04
Marital status	0.24	0.40
Type of housing	–0.09	0.014

According to the results of the standardized SF-36 questionnaire, there were also significant differences by gender, so physical health averaged 35.97 ( $\pm 1.77$ ) in women and 34.49 ( $\pm 2.14$ ) in men, MH 37.98 (1.62) in women and 34.15 (1.99) in men.

The universal SF-36 index was 0.6 ( $\pm 0.02$ ) for women and 0.55 ( $\pm 0.033$ ) for men (Table-5).

In this study, it was found that the physical health and MH of men lagged slightly behind that of women.

Furthermore, the indicators of physical and MH differed according to age. Thus, the indicators of

**Table 5: Physical, mental health, and universal SF-36 index scores as a function of gender (n = 302)**

Characteristics	Me	SD	95% CI
Physical health			
Men	34.49397	2.14576	30.23576–38.75217
Women	35.97869	1.77834	32.44963–39.50775
Mental health			
Men	34.15741	1.99539	30.19762–38.1172
Women	37.98688	1.62332	34.76545–41.20832
QALY universal index			
Men	0.55933	0.03317	0.49349–0.62517
Women	0.60458	0.02498	0.55499–0.65416

Me: Mean value, SD: Standard deviation, CI: Confidence interval.

physical and MH were higher for respondents in the age group of 30–39 years old and (physical health – 43.5; MH – 39.7) 50–59 years old (physical health – 34.0; MH – 43.2). Respondents in the age group of 70 and older showed the lowest rates (physical health – 12.2; MH – 7.2), as well as 60–69 years old (physical health – 11.8; MH – 14.6).

On the eight health scales of the SF-36 standardized instrument, the highest scores were on the domains of BP Me – 50.39 (SD 26.91), SF Me – 47.09 (SD 24.24), and RE Me – 46.12 (SD 32.10). The distribution of questionnaire results across the eight health domains is presented in Table 6.

**Table 6: The distribution of the survey results by eight health areas of the rural population (n = 302)**

Domains	Me	SD	Maximum	Minimum
PF	43.33	32.40	100	0
RP	35.35	16.56	100	0
BP	50.39	26.91	100	21
GH	32.85	23.02	85	0
VT	40.05	24.27	80	10
SF	47.09	24.24	100	12.5
RE	46.12	32.10	100	0
MH	40.64	23.75	76	12

Me: Mean value, SD: Standard deviation, PF: Physical functioning, RP: Role physical, BP: Body pain, GH: General health, VT: Vitality, SF: Social functioning, RE: Emotional role, MH: Mental health.

## Discussion

Kazakhstan is a developing country with a small population (18 million 395.6 thousand) and a vast territory, with varying population density and a variety of climatic features. The rural population of the Republic of Kazakhstan at the beginning of 2019 is 7 million 697 thousand, which corresponds to 41.8% of the total population, with almost half of all rural residents (more than 3 million) of the country living in two regions – it is Almaty and Turkestan. Among the rural population, the female population predominates, 52% versus 48% of the male population. There is an aging trend in the population: The share of the rural population aged 60 and over reached 12% in 2019, with a prevalence of the share of the female population up to 59% [22].

Quality of life is a multidimensional concept, which includes both economic indicators, determining the standard of living of the population, and sociopsychological indicators, expressed in the degree

of satisfaction with the living conditions of people themselves. It also includes such important components as the state of the labor market, the quality of medical care, basic social services, and the environmental aspect. Rural residents characterized by worse health indicators and a low quality of life. Low quality of life has been associated with low and unfair access to health and social services, low levels of education, high levels of unemployment, etc. Numerous studies conducted in Turkey and Poland confirm that HRQOL indicators are lower for rural residents than for urban residents [23], [24].

In this study, we tried to identify some features of the quality of life of the rural population, as well as satisfaction with the living conditions in the countryside. Socioeconomic factors affecting quality of life are becoming increasingly important, including HRQOL [25], and our results confirm previous research on this topic.

Our research was dominated by women in the age categories 30–39 years. Most of the respondents were married. It was interesting to note that with increasing age of the respondents, the indicators of quality of life, self-rated quality of life, and indicators for the health domains physical health and social health, as well as emotional role playing were relatively lower. These results are confirmed by other studies [26].

Throughout the world, education is always viewed as an important contribution toward a better quality of life [27]. Hence, we also studied the level of education of the rural population. According to the results of this study, the majority of rural residents have higher and secondary specialized education. Residents with higher education were less satisfied with living conditions in the countryside, such as satisfaction with the quality of medical services, satisfaction with the availability and prices of goods, and satisfaction with public transport. The results are supported by other studies in this area [28], [29].

Many respondents have been living in rural areas for more than 10–15 years, the majority of rural families have 5–8 people in their family. The length of time spent in rural areas was also reflected in the answers on satisfaction with living conditions in the countryside. Rural residents living for more than 10 years rate their quality of life and subjective assessment of health as “poor” and “below average” and associate this with the low quality and availability of medical services, especially PHC and emergency care. Our results are consistent with the previous studies in rural areas [30].

The availability and quality of medical services have a huge impact on the quality of life, as well as on the health of the population. Hence, we studied the satisfaction of the population with the territorial accessibility and quality of the medical services provided. One-third of respondents (31%) are not satisfied with the quality and availability of medical services. The poor quality of medical services was associated with

a shortage of qualified personnel, long queues, and insufficient equipment of medical institutions.

Survey data further confirm that rural residents continue to face inequitable access to health services and poor health outcomes. The obtained results are confirmed by a study conducted in Australia, which also noted the low availability of basic health care, in particular PHC services for the population living in rural and remote areas, which was associated with the geographical remoteness of rural areas, as well as low availability of human resources [31]. Additional research is needed on the availability and satisfaction of the rural population with the quality of medical services provided.

Recently, more and more attention has been paid to the availability of housing, living conditions, and infrastructure in rural areas. Furthermore, in our research, to study the level and living conditions of the population in rural areas, we included in the questionnaire questions about the availability of housing, the amount of income, levels of education, and employment. This study showed that more than half of the respondents have their own housing. These factors influenced the desire to move villagers to large cities. The decision to stay or leave their place of residence largely depends on the respondents' perception of the quality of life in rural areas.

In our study, respondents were offered answers indicating the reasons for wanting to move to the city, taking into account economic and non-economic factors. Hence, almost 40% of the rural population want to change their place of residence to the city. It is important to note that the desire to move was associated with the level of income and a larger number of family members; at the same time, age also significantly influenced the desire to move. Thus, the younger respondents more demonstrated their desire to migrate to urban areas and this was primarily due to unemployment. From the point of view of financial security, income has a positive and significant relationship with the quality of life, which is confirmed by a number of studies [32], [33], [34].

Since, a higher income is associated with a better and more stable financial situation, which is confirmed by the previous studies in Malaysia and European countries [35], [36], which confirmed a significant relationship between income and an improvement in the quality of life. More than a third (34.77%) of the entire sample of this study have an average monthly income of \$ 120–240 (US dollar) per month, while the average family in a village consists of 5–8 people. Considering that the amount of the subsistence minimum in Kazakhstan is 34,302 tenge (81,762 US dollars), at the rate of 419.53 tenge/1 US dollar, and the average monthly wage is 222,261 tenge (529,785 US dollars) [37], it can be concluded that the income of the rural population does not even reach the subsistence level and is several times less than the average monthly wage.

In view of the fact that still socioeconomic problems such as unemployment, low quality of life,

and low availability of medical services do not find their solution, which significantly affects the subjective assessment of the quality of life. This situation was aggravated as a result of the quarantine and isolation measures taken in the country in the wake of the COVID-19 pandemic. The state of emergency in Kazakhstan was introduced on March 16, 2020 [38]. The COVID-19 pandemic has had a significant impact on the labor market worldwide. Directly in Kazakhstan, the COVID-19 pandemic also made its own adjustments in the labor market, significantly weakening activity in the field of employment. The number of unemployed increased by 2.6%, up to 454 thousand people [37]. There is a decrease in the number of the employed population in almost all regions of the country. Notably, the impact of the COVID-19 pandemic on rural populations has been severe, with significant negative impacts on unemployment, overall life satisfaction, MH, and economic outlook [39].

The availability and prices of food products, school and preschool education, and public transport were rated as “moderately satisfactory.” At the same time, the satisfaction and availability of social state programs, working conditions, and the quality of drinking water did not sufficiently satisfy the villagers. The conditions in which people live, study, and work can affect health and lead to inequalities in health.

The indicators of physical and MH according to SF-36 and the QoL index were higher in men than in women. Such results are most likely influenced by the quarantine measures taken in connection with the COVID-19 pandemic. It can be assumed that prolonged isolation and uncertainty likely had psychological consequences, as COVID-19 has significantly changed the daily life of many people [40]. HRQOL indicators differed not only by gender but also by the age of the respondents. Thus, the indicators of physical and MH for eight health domains were higher among the respondents in the age group of 30–39 and 50–59 years old, and in the age group of 60–69 years old, 70 years and older, the indicators for health domains were much lower. According to the results of the regression analysis, it was revealed that the HRQOL indicators related to physical and MH are significantly influenced by income, but there were no dependent relationships on other variables of living conditions, such as marital status, housing availability, satisfaction with work conditions, and public transport.

Our research has strengths and limitations. The main advantage of our study is that this study is almost the only one in the field of HRQOL study of the rural population of the Republic of Kazakhstan, as well as satisfaction with living conditions in the countryside. Research restrictions are related to quarantine measures due to the COVID-19 pandemic, which made it impossible to conduct a face-to-face survey to clarify some points in the questionnaire, which, in turn, could affect the respondents' answers and also the interpretation of the data obtained.

## Conclusions

We can say that the quality of life of the rural population of Akmola and Turkestan regions of the Republic of Kazakhstan remains rather low, in view of the fact that the average monthly income, the availability of medical services remains low. Meanwhile, the level of unemployment, problems with housing remain high, according to the subjective assessment of the state of health and indicators of physical and MH.

In this study, one can see the insufficient availability of medical care for the rural population, especially ambulance, which significantly affected the quality of life of people living in rural areas. Quarantine measures related to COVID-19 also had an impact on the increase in unemployment, however, during the quarantine, there is a deterioration in MH indicators among men compared to women.

The rural population needs new approaches of management decisions and strategic state social programs aimed at improving the welfare of the rural population. This study is the basis for the development of a systematic approach to strategies aimed at eliminating existing inequalities in health and quality of life between urban and rural residents, including inequalities in the distribution of health services.

## Research Ethics

This research obtained an ethics-free certificate from the Local Bioethics Committee of Astana Medical University.

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## References

- World Health Organization. Declaration of Alma Ata. World Health Organization; 2000. Available from: [http://www.who.int/publications/almaata\\_declaration\\_en.pdf](http://www.who.int/publications/almaata_declaration_en.pdf). [Last accessed on 2021 Mar 22].
- Declaration of Astana. Geneva: World Health Organization; 2019. Available from: <https://apps.who.int/iris/bitstream/handle/10665/328123/WHO-HIS-SDS-2018.61-eng.pdf?sequence=1&isAllowed=y>. [Last accessed on 2021 Apr 02].
- Primary Health Care towards Universal Health Coverage. Report by the Director-General. Geneva: World Health Organization; 2019. Available from: [https://apps.who.int/gb/ebwha/pdf\\_files/WHA72/A72\\_12-en.pdf](https://apps.who.int/gb/ebwha/pdf_files/WHA72/A72_12-en.pdf). [Last accessed on 2021 May 15].
- Primary Health Care: Today More Relevant than Ever, WHO, Health Report in the World, [in Russian]; 2008. Available from: <http://www.demoscope.ru/weekly/2008/0351/biblio01.php>. [Last accessed on 2021 Mar 22].
- McGrail MR, Humphreys JS, Ward B. Accessing doctors at times of need-measuring the distance tolerance of rural residents for health-related travel. *BMC Health Serv Res*. 2015;15:212. <https://doi.org/10.1186/s12913-015-0880-6> PMID:26022391
- Douthit N, Kiv S, Dwolatzky T, Biswas S. Exposing some important barriers to health care access in the rural USA. *Public Health*. 2015;129(6):611-620. <https://doi.org/10.1016/j.puhe.2015.04.001> PMID:26025176
- Australian Government. Australian Institute of Health and Welfare. Rural & Remote Health. Web Report. Available from: <https://www.aihw.gov.au/reports/rural-health/rural-remote-health/contents/rural-health>. [Last accessed on 2021 Jun 07].
- Alfaqeeh G, Cook EJ, Randhawa G, *et al*. Access and utilisation of primary health care services comparing urban and rural areas of Riyadh Province, Kingdom of Saudi Arabia. *BMC Health Serv Res*. 2017;106:189-97. <http://doi.org/10.1186/s12913-017-1983-z>
- Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. *Acta Biomed*. 2020;91:157-60. <https://doi.org/10.23750/abm.v91i1.9397>
- Wong H, Moore K, Angstman KB, Garrison GM. Impact of rural address and distance from clinic on depression outcomes within a primary care medical home practice. *BMC Fam Pract*. 2019;20:123. <https://doi.org/10.1186/s12875-019-1015-7> PMID:31488051
- Lakhani HV, Pillai SS, Zehra M, Sharma I, Sodhi K. Systematic review of clinical insights into novel coronavirus (CoVID-19) pandemic: Persisting challenges in U.S. rural population. *Int J Environ Res Public Health*. 2020;17:4279. <https://doi.org/10.3390/ijerph17124279>
- Liu J, Mao Y. Patient satisfaction with rural medical services: A cross-sectional survey in 11 Western Provinces in China. *Int J Environ Res Public Health*. 2019;16:39-68. <http://doi.org/10.3390/ijerph16203968>
- Aldabergenova G, Turgambayeva A, Brusati LG. Problems of the organization of the labor process that affect the effectiveness of the work of Kazakhstani doctors. *Iran J Public Health*. 2021;50(10):2144-5.
- WHOQOL Group. The World Health Organization quality of life assessment (WHOQOL): Position paper from the World Health Organization. *Soc Sci Med*. 1995;41:1403-9. [https://doi.org/10.1016/0277-9536\(95\)00112-K](https://doi.org/10.1016/0277-9536(95)00112-K)
- Brown J, Bowling A, Flynn T. Models of Quality of Life: A Taxonomy, Overview and Systematic Review of the Literature. (Project Report) European Forum on Population Ageing Research; 2004. p. 113.
- Department of Economic and Social Affairs – United Nations. Available from: <https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html>. [Last accessed on 2021 Mar 13].
- Moore C, Probst J, Tompkins M, Cuffe S, Martin A. Poverty, Stress, and Violent Disagreements in the Home among Rural Families. South Carolina Rural Health Research Center; 2005. Available from: <http://rhr.sph.sc.edu> [Last accessed on 2021 Mar 03].

18. Soh SE, Morris ME, McGinley JL. Determinants of health-related quality of life in Parkinson's disease: A systematic review. *Parkinsonism Relat Disord*. 2011;17(1):1-9. <https://doi.org/10.1016/j.parkreldis.2010.08.012>  
PMid:20833572
19. Klepac N, Pikija S, Kraljic T, Relja M, Trkulja V, Juren S, et al. Association of rural life setting and poorer quality of life in Parkinson's disease patients: A cross-sectional study in Croatia. *Eur J Neurol*. 2007;14(2):194-8. <https://doi.org/10.1111/j.1468-1331.2006.01604.x>
20. Vaishar A, Vidovićová L, Figueiredo E. Quality of rural life. *Editorial. Europ Countrys*. 2018;2:180-90 <https://doi.org/10.2478/euco-2018-0011>
21. Filip RS, Zagorski J. Osteoporosis risk factors in rural and urban women from the Lublin region of Poland. *Ann Agric Environ Med*. 2005;12:21-6.
22. Imanova ZH, Mukhanova GT, Sakhanova LK, Imambaev NI, Naurzalieva AD. "Creation of an Effective Model for the Provision of Medical Care to the Rural Population, Including drug Provision, Taking into Account International Experience" *Methodological Recommendations, Nur-Sultan*; 2020. p. 44.
23. Oguzturk O. Differences in quality of life in rural and urban populations. *Clin Invest Med*. 2008;31(6):E346-50. <https://doi.org/10.25011/cim.v31i6.4920>
24. Zagodzón P, Kolarzyk E, Marcinkowski JT. Quality of life and rural place of residence in Polish women – Population based study. *Ann Agric Environ Med*. 2011;18(2):429-32.
25. Cassedy A, Drotar D, Ittenbach R, Hottinger S, Wray J, Wernovsky G, et al. The impact of socio-economic status on health related quality of life for children and adolescents with heart disease. *Health Qual Life Outcomes*. 2013;11:99. <http://doi.org/10.1186/1477-7525-11-99>
26. Chubirko MI, Pichushkina NM, Masailova LA, Lastochkina GV. Assessment of the quality of life of the rural population *Zdravoohr. RF*. 2012;6:43-4. Available from: <https://cyberleninka.ru/article/n/otsenka-kachestva-zhizni-selskogo-naseleniya> [Last accessed on 2021 Mar 05].
27. Zakharova RN, Mikhailova AE, Ionova TI, Timofeev LF, Krivoshapkin VG. Population indicators of the quality of life of the population of the Republic of Sakha (Yakutia) [Electronic resource]. Available from: <http://www.saha2013.nc-i.ru/tezis/show/1933.html> [Last accessed on 2021 Apr 11].
28. Qu GB, Zhao TY, Zhu BW, Tzeng GH, Huang SL. Use of a modified DANP-mV model to improve quality of life in rural residents: The empirical case of Xingshisi Village, China. *Int J Environ Res Public Health*. 2019;16(1):153. <https://doi.org/10.3390/ijerph16010153>
29. Gessert C, Waring S, Bailey-Davis L, Roberts M, VanWormer J. Rural definition of health: A systematic literature review. *BMC Public Health* 2015;15:378. <https://doi.org/10.1186/s12889-015-1658-9>
30. Lam CL, Fong DY, Lauder IJ, Lam TP. Impact of health related quality of life (HRQOL) on the use of health care services in the Chinese population. *Soc Sci Med*. 2002;55(9):1635-46. [http://doi.org/10.1016/S0277-9536\(01\)00296-9](http://doi.org/10.1016/S0277-9536(01)00296-9)
31. Thomas SL, Wakerman J, Humphreys JS. Ensuring equity of access to primary health care in rural and remote Australia – What core services should be locally available? *Int J Equity Health*. 2015;14:111. <https://doi.org/10.1186/s12939-015-0228-1>
32. Singh-Manoux A, Adler NE, Marmot MG. Subjective social status: Its determinants and its association with measures of ill-health in the Whitehall II study. *Soc Sci Med*. 2003;56(6):1321-33. [http://doi.org/10.1016/S0277-9536\(02\)00131-4](http://doi.org/10.1016/S0277-9536(02)00131-4)
33. Wilkinson RG. Income distribution and life expectancy. *BMJ*. 1992;304(6820):165-8. <http://doi.org/10.1136/bmj.304.6820.165>
34. Operario D, Adler NE, Williams DR. Subjective social status: Reliability and predictive utility for global health. *Psychol Health*. 2004;19(2):237-46. <http://doi.org/10.1080/08870440310001638098>
35. Idris K, Mohamed Shaffril HA, Yassin SM, Abu Samah A, Hamzah A, Abu Samah B. Quality of life in rural communities: Residents living near to Tembeling, Pahang and Muar Rivers, Malaysia. *PLoS ONE*. 2016;11(3):e0150741. <https://doi.org/10.1371/journal.pone.0150741>
36. Knesebeck OV, Wahrendorf M, Hyde M, Siegrist J. Socio-economic position and quality of life among older people in 10 European countries: Results of the share study. *Ageing Soc*. 2007;27:269-84. <https://doi.org/10.1017/S0144686X06005484>
37. Official Website of Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan. Available from: <https://stat.gov.kz/36>. [Last accessed on 2021 Apr 19].
38. Decree of the President of the Republic of Kazakhstan On the Introduction of a State of Emergency in the Republic of Kazakhstan. [in Russian] March 15, 2020. No. 285, Akorda, Nur-Sultan. Available from: <https://adilet.zan.kz/rus/docs/U2000000285/links>. [Last accessed on 2021 Apr 19].
39. Muellera JT, McConnellb K, Burowc PB, Pofahlb K, Merdjanoffd AA, Farrellb J. Impacts of the COVID-19 pandemic on rural America. *PNAS*. 2021;118(1):2019378118. <https://doi.org/10.1073/pnas.2019378118>
40. Pierce M, Hope H, Ford T, Hatch S, Hotopf M, John A, et al. Mental health before and during the COVID-19 pandemic: A longitudinal probability sample survey of the UK population. *Lancet Psychiatry*. 2020;7(10):883-92. [https://doi.org/10.1016/S2215-0366\(20\)30308-4](https://doi.org/10.1016/S2215-0366(20)30308-4)