CROSS-SECTIONAL STUDY OF THE LEVEL OF PUBLIC TRUST IN VARIOUS SOURCES OF INFORMATION REGARDING COVID-19 AND ITS ASSOCIATION WITH SOCIO-DEMOGRAPHIC CHARACTERISTICS AND COVID-19 VACCINE UPTAKE AMONG KAZAKHSTANI POPULATION

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Abstract

Background: Trust has proven to be a key element in all stages of the fight against the COVID-19 pandemic and a decisive element in the success of the worldwide vaccination campaign.

Aim: The aim of this research is to study the level of public trust in various sources of information regarding COVID-19 in Kazakhstan and its association with COVID-19 vaccine uptake and socio-demographic characteristics in order to improve future information campaigns.

Methods: Study design - cross-sectional, probabilistic sampling, taking into account the distribution of gender, age, territory, and type of residence in the general population of the Republic of Kazakhstan. The data collection tool was an adapted questionnaire with validated scales in Russian and Kazakh.

Results: The level of trust in most sources of information is rather low. The most trusted category is "consultations with medical professionals", which corresponds to an average level of trust with a mean score of 3.02 (95% CI: 2.94-3.09). The lowest level of trust was noted for "information from celebrities and social media influencers" - 2.12 (95% CI: 2.05-2.19).

Conclusion: Constant dialog between trusted healthcare professionals and the community can be an effective strategy to promote healthcare campaigns, including promoting adherence and compliance with preventive regulations and guidance as well as vaccination uptake. Findings are important for understanding the necessary channels of health communication.

Keywords: COVID-19, pandemic, Kazakhstan, information, trust, vaccination.

Резюме

ПОПЕРЕЧНОЕ ИССЛЕДОВАНИЕ УРОВНЯ ДОВЕРИЯ НАСЕЛЕНИЯ К РАЗЛИЧНЫМ ИСТОЧНИКАМ ИНФОРМАЦИИ О COVID-19 И ЕГО СВЯЗИ С СОЦИАЛЬНО-ДЕМОГРАФИЧЕСКИМИ ХАРАКТЕРИСТИКАМИ И УРОВНЕМ ВАКЦИНАЦИИ ПРОТИВ COVID-19 У НАСЕЛЕНИЯ КАЗАХСТАНА

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Введение: Доверие оказалось ключевым элементом на всех этапах борьбы с пандемией COVID-19 и решающим элементом успеха всемирной кампании вакцинации.

Цель. Целью данного исследования является изучение уровня общественного доверия к различным источникам информации о COVID-19 в Казахстане и его связи с вакцинацией против COVID-19 и социально-демографическими характеристиками для улучшения будущих информационных кампаний.

Методы: Дизайн исследования – поперечный, вероятностная выборка с учетом распределения по полу, возрасту, территории и типу проживания в общей популяции РК. Инструментом сбора данных была адаптированная анкета с валидированными шкалами на русском и казахском языках.

Результаты: Уровень доверия к большинству источников информации достаточно низкий. Наибольшим доверием пользуется категория «консультации с медицинскими работниками», что соответствует среднему уровню доверия со средним баллом 3,02 (95% ДИ: 2,94-3,09). Самый низкий уровень доверия отмечен к «информации от знаменитостей и влиятельных лиц в социальных сетях» — 2,12 (95% ДИ: 2,05–2,19).

Выводы: Постоянный диалог между доверенными медицинскими работниками и обществом может быть эффективной стратегией для продвижения кампаний в области здравоохранения, включая поощрение соблюдения профилактических мер и руководств, а также вакцинации. Полученные данные важны для понимания необходимых каналов коммуникации в сфере здравоохранения.

Ключевые слова: COVID-19, пандемия, Казахстан, информация, доверие, вакцинация.

Түйіндеме

ҚАЗАҚСТАН ТҰРҒЫНДАРЫНЫҢ COVID-19 ТУРАЛЫ ӘРТҮРЛІ АҚПАРАТ КӨЗДЕРІНЕ СЕНІМ ДЕҢГЕЙІН ЖӘНЕ ОНЫҢ ӘЛЕУМЕТТІК-ДЕМОГРАФИЯЛЫҚ СИПАТТАМАЛАРМЕН ЖӘНЕ COVID-19-ҒА ҚАРСЫ ЕКПЕ АЛУМЕН БАЙЛАНЫСЫН КӨЛДЕНЕҢ ЗЕРТТЕУІ

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Кіріспе: Сенім COVID-19 пандемиясымен күрестің барлық кезеңдеріндегі негізгі элемент және дүниежүзілік екпе алу науқанының сәттілігінің маңызды элементі екенін дәлелдеді.

Зерттеу мақсаты: Бұл зерттеудің мақсаты – болашақ ақпараттық науқандарды жақсарту үшін Қазақстандағы COVID-19 туралы әртүрлі ақпарат көздеріне халықтың сенім деңгейін және оның COVID-19-ға қарсы екпе алу және әлеуметтік-демографиялық сипаттамаларымен байланысын зерттеу.

Зерттеу материалдар мен әдістері: Зерттеудің дизайны - көлденең қималық, ықтималдық іріктеу, Қазақстан Республикасының жалпы халқының жынысы, жасы, аумағы мен тұрғылықты жерінің түрі бойынша бөлінуін ескерілген. Деректерді жинау құралы орыс және қазақ тілдеріндегі валидацияланған және бейімделген сауалнама болып табылады.

Нәтижелері: Ақпарат көздерінің көпшілігіне деген сенім деңгейі өте төмен. Ең сенімді санат – «Денсаулық сақтау мамандарымен консультациялар», ол 3,02 орташа баллмен сенімділіктің орташа деңгейіне сәйкес келеді (95% CI: 2,94-3,09). Ең төменгі сенім деңгейі «атақты адамдар мен әлеуметтік желіге әсер етушілерден алынған ақпарат» үшін белгіленді – 2,12 (95% CI: 2,05-2,19).

Қорытынды: Сенімді медицина мамандары мен жұртшылық арасындағы үздіксіз диалог профилактикалық шаралар мен нұсқауларды, сондай-ақ екпе алу ынталандыруды қоса алғанда, қоғамдық денсаулық сақтау науқандарын ілгерілетудің тиімді стратегиясы болуы мүмкін. Алынған деректер денсаулық сақтау саласындағы қажетті байланыс арналарын түсіну үшін маңызды.

Түйінді сөздер: COVID-19, пандемия, Қазақстан, ақпарат, сенім, екпе.

Introduction

On May 5, the World Health Organization [22] declared that COVID-19 is no longer a "public health emergency of international concern". Nevertheless, the COVID-19 pandemic has been one of the most serious global challenges. Various strategies and actions have been taken to address all the unprecedented challenges that have arisen during the pandemic, including restrictive measures, the implementation of effective vaccines, and more [17].

One of the big questions that has come up during the COVID-19 pandemic is why some countries have been more successful than others in suppressing waves of infections and death rates [12]. It seems that the success of countries in the fight against COVID-19 is associated with a common key element - trust [17]. Trust has proven to be a key element in all stages of the fight against the COVID-19 pandemic, a decisive element in the success of the worldwide vaccination campaign [17]. In a 2014 review [18] that examined the importance of public trust during a pandemic, it was found that trust in healthcare institutions has a positive effect on people's willingness to adopt recommended behaviors. Moreover, the authors also indicate that it is crucial to establish trust in healthcare authorities before a pandemic occurs [18].

Vaccination is one of the most important public health measures to reduce the transmission of COVID-19 and protect people from serious illness, hospitalization, and death [14]. The rapid development of a COVID-19 vaccine has been vital to the fight against the pandemic [14]. Several vaccines against the virus were quickly developed and proven to be effective and safe [14]. A 2021 global survey across 19 countries [1] found that around 30% of participants were hesitant to get vaccinated against COVID-19, with acceptance rates varying from country to country.

The acceptance and use of vaccines depend on the public's trust in the vaccine itself, as well as in the professionals who report and administer it [1].

Thus, it is relevant to study the most trusted sources of information regarding COVID-19 among the local population in order to optimize future public health communication campaigns, including vaccination and restrictive measures.

The aim of the study is to determine the level of public trust in various sources of information regarding COVID-19 in Kazakhstan and its association with COVID-19 vaccine uptake and socio-demographic characteristics in order to improve future information campaigns.

Materials and Methods

This study is part of a research project titled " The Impact of the COVID-19 Pandemic and Restrictive Measures on Lifestyles and Access to Health Services in Kazakhstan" funded by the Science Committee of the Ministry of Education and Science of the Republic of Kazakhstan (Grant No. AP09260497). The design of the study is cross-sectional, probabilistic sampling, taking into account the distribution of gender, age, territory, and type of residence in the general population, according to the statistical data of the Statistics Committee of the Ministry of National Economy of the Republic of Kazakhstan.

In the second phase of the interview, the sample consisted of 900 respondents who had already participated in the first survey conducted in the summer of 2021; the retention rate was 88.7%. The data collection tool was an adapted questionnaire with validated scales in Russian and Kazakh. Survey period: July 27–September 10, 2022.

The sociological survey of respondents was conducted face-to-face with oral consent to participate in the study. The socio-demographic characteristics of the survey included the distribution of respondents by gender, age; level of education; and residency area. The level of trust was assessed by the question: "How much do you trust information about COVID-19 from the following sources: local radio and TV channels; international TV channels; local websites or news pages; conversations with family and friends; conversations with colleagues, consultations with medical professionals; international websites or news pages; social networks (e.g., Facebook, Twitter, YouTube, Telegram, WhatsApp, Instagram); official, governmental press releases; press releases of medical institutions; celebrities and social media influencers; mosque representatives and church ministers". The level of trust in various sources of information among the respondents was assessed on a scale from 1 to 5, where 1 - no trust; 2 - low level of trust; 3 - average level of trust; 4 - high level of trust; and 5 - absolute trust. Descriptive statistics were carried out to analyze socio-demographic characteristics and determine the level of respondents' trust in various sources of information. A t-test and ANOVA were used to calculate p-values and 95% confidence intervals for the association between the source of information and sociodemographic characteristics as well as vaccination status. Statistical significance was set at a p-value of 0.05.

The study was approved by the ethical committee of the Asfendiyarov Kazakh National Medical University No. 10 (101) on September 30, 2020.

Results

The socio-demographic characteristics of this population were described in a previous study [8]. Due to the fact that the retention rate is 88.7%, we provide a description of the socio-demographic indicators of the respondents who took part in both stages of the study (Table 1). According to the results of our study, more than half of the participants were women (53.56%), almost two-thirds of the respondents were married or in a serious relationship (62.67%), more than half worked full time (58.44%), lived in urban areas (58.22%), and were vaccinated (71.33%).

Table 2 presents the mean and confidence interval of the levels of respondents' trust in various sources of information. The level of trust in most sources of information is quite low and does not rise above the average level. The most trusted category is "consultations with medical professionals", which corresponds to an average level of trust with a mean score of 3.02 (95% CI: 2.94-3.09). At the same time, "Conversations with colleagues and friends" have the second highest level of trust, with a mean level of trust of 2.96 (95% CI: 2.90-3.04). The lowest level of trust was noted for such sources of information as "information from celebrities and social media influencers" - 2.12 (2.05-2.19) and "social networks such as Twitter, Facebook, YouTube, WhatsApp, Instagram, Telegram" - 2.31 (2.24-2.38). Press releases of medical institutions, conversations with colleagues, and official, governmental press releases had a similar level of trust (2.76, 2.75, and 2.71, respectively) (Table 2).

Table 3 reflects the differences in the level of trust in information sources by socio-demographic characteristics and vaccination status. Compared to men, women tend to trust more consultations with medical professionals (p-value = 0.049). Compared to the urban population, the rural population reports more trust consultations with medical professionals (p-value = 0.048), press releases of medical institutions (p-value=0.002), international Websites or news pages (p-value=0.028), official, governmental press releases (p-value=0.002), international radio and TV channels (p-value=0.027), mosque representatives and church ministers (p-value=0.0001), celebrities and social media influencers (p-value=0.002). Adults at ages 45-59 years tend to trust more conversations with family and friends compared to other age categories (p-value=0.046), respondents at ages 30-44 and 45-59 trusted more conversations with colleagues (p-value=0.009). The level of education received and employment status also had an impact on trust in various sources of information (Table 3). Also, we looked at the difference in the level of trust in information sources between respondents who received at least one dose of the COVID-19 vaccine and respondents who did not receive the COVID-19 vaccine. Vaccinated respondents significantly more trusted information received from all sources of information except conversations with family and friends (p-value=0.663).

Table 1.

Socio-demographic characteristics of study participants (N=900).

Characteristic	N (%)
Gender	
Female	482 (53.56)
Male	418 (46.44)
Age	
18-29	231 (25.67)
30-44	302 (33.56)
45-59	236 (26.22)
60+	131 (14.56)
Marital status	
Married/ in a serious relationship	564 (62.67)
Not married / widow/widower / divorced	336 (37.33)
Employment status	
Full-time	526 (58.44)
Part-time	46 (5.11)
Unemployed	72 (8.00)
Other (housewife, retired, student, temporarily laid off, sick or parental leave)	256 (28.44)
Education	
Higher (bachelor, specialist)	366 (40.67)
Secondary special (technical school, college)	310 (34.44)
Secondary (10-11 grades, incomplete secondary, elementary school)	224 (24.89)
Area of residency	
Urban	524 (58.22)
Rural	376 (41.78)
Vaccination status	
Vaccinated (received at least 1 dose of COVID-19 vaccine)	642 (71.33)
Not vaccinated	258 (28.67)
Self-reported COVID-19	169 (18.78)
Influenza vaccination (during last year, yes)	244 (27.11)

Table 2.

The level of trust in various sources of information among respondents.

№	Sources of information	Mean and confidence level of trust	Standard deviation
1	Consultations with medical professionals	3.02 (2.94-3.09)	1.19
2	Conversations with family and friends	2.96 (2.89-3.04)	1.16
3	Press releases of medical institutions	2.76 (2.68-2.84)	1.18
4	Conversations with colleagues	2.75 (2.69-2.82)	1.06
5	International TV channels	2.57 (2.49-2.64)	1.15
6	Official, governmental press releases	2.71 (2.64-2.79)	1.17
7	Local radio and TV channels	2.59 (2.51-2.67)	1.18
8	International Websites or news pages	2.53 (2.46-2.61)	1.09
9	Mosque representatives and church ministers	2.58 (2.50-2.66)	1.21
10	Local websites or news pages	2.49 (2.42-2.57)	1.10
11	Social networks (for example, Facebook, Twitter, YouTube, Telegram, WhatsApp, Instagram)	2.31 (2.24-2.38)	1.06
12	Celebrities and social media influencers	2.12 (2.05-2.19)	1.06

Table 3.

Differences in the level of trust in various information sources by socio-demographic characteristics and vaccination status.

№		1	2	3	4	5	6
Sources of information		Consultations with medical professionals	Conversations with family and friends	Press releases of medical institutions	International Websites or news pages	Official, governmental press releases	Conversations with colleagues
Female		3.09 (2.99 - 3.19)	3.02 (2.93 - 3.11)	2.80 (2.70 - 2.90)	2.53 (2.44 - 2.63)	2.73 (2.63 - 2.83)	2.77 (2.68 - 2.86)
Male		2.93 (2.81 - 3.05)	2.90 (2.79 - 3.01)	2.72 (2.60 - 2.84)	2.54 (2.43-2.65)	2.69 (2.57 - 2.81)	2.74 (2.63-2.85)
P-value		**0.049**	0.095	0.331	0.948	0.619	0.670
Urban population		2.95 (2.85-3.05)	2.95 (2.85 - 3.04)	2.66 (2.56 - 2.76)	2.47 (2.37 - 2.56)	2.61 (2.51 - 2.71)	2.70 (2.62 - 2.79)
Rural population		3.11 (2.99 -3.23)	2.99 (2.87 - 3.10)	2.90 (2.79 - 3.02)	2.63 (2.52 - 2.74)	2.86 (2.74 - 2.98)	2.83 (2.71 - 2.94)
P-value		**0.048**	0.592	**0.002**	**0.028**	**0.002**	0.082
Respondents who were vaccinated		3.13 (3.04 - 3.21)	2.97 (2.90 - 3.06)	2.88 (2.79 - 2.97)	2.65 (2.57 - 2.74)	2.82 (2.74-2.92)	2.83 (2.75-2.91)
Respondents who were not vaccinated		2.75 (2.60 - 2.90)	2.94 (2.80 - 3.08)	2.47 (2.32 - 2.62)	2.23 (2.10 - 2.37)	2.43 (2.28 - 2.57)	2.57 (2.44-2.71)
p-value		**<.0001**	0.663	**<.0001**	**<.0001**	**<.0001**	**0.001**
Age	18–29	3.13 (2.98 - 3.29)	2.81 (2.67- 2.96)	2.85 (2.70 - 3.00)	2.69 (2.55 - 2.83)	2.86 (2.71- 3.01)	2.57 (2.43 - 2.70)
	30–44	2.95 (2.81 - 3.08)	2.94 (2.82 - 3.07)	2.74 (2.61 - 2.87)	2.46 (2.34 - 2.59)	2.69 (2.56 - 2.82)	2.85 (2.73 - 2.97)
	45–59	3.00 (2.85 - 3.15)	3.08 (2.94 - 3.22)	2.74 (2.59 - 2.89)	2.54 (2.40 - 2.68)	2.69 (2.54 - 2.84)	2.84 (2.71 - 2.98)
	60 yr. and older	3.00 (2.80 - 3.20)	3.06 (2.87 - 3.25)	2.70 (2.50 - 2.90)	2.41 (2.22 - 2.59)	2.54 (2.34 - 2.74)	2.70 (2.52 - 2.89)
P-value		0.338	**0.046**	0.615	0.052	0.080	**0.009**
Education							
	Higher	3.09 (2.97 - 3.21)	2.99 (2.88 - 3.10)	2.82 (2.70 - 2.94)	2.67 (2.56 - 2.78)	2.76 (2.64 - 2.88)	2.81 (2.70 - 2.92)
	Secondary special	2.99 (2.86 - 3.13)	2.98 (2.86 - 3.11)	2.74 (2.61 - 2.87)	2.41 (2.29 - 2.53)	2.71 (2.58 -2.84)	2.77 (2.65 - 2.89)
	Secondary	2.93 (2.77 - 3.08)	2.90 (2.75 - 3.04)	2.69 (2.54 - 2.85)	2.47 (2.33 - 2.62)	2.64 (2.49 - 2.80)	2.65 (2.51 - 2.79)
P-value		0.253	0.588	0.393	**0.006**	0.500	0.195
Employment status							
	Full-time	3.01 (2.91 - 3.12)	2.98 (2.88 - 3.07)	2.75 (2.65 - 2.85)	2.52 (2.42 - 2.61)	2.73 (2.63 - 2.83)	2.85 (2.76 - 2.94)
	Part-time	2.85 (2.50 - 3.19)	2.76 (2.44 - 3.08)	2.48 (2.14 - 2.82)	2.48 (2.16 - 2.79)	2.52 (2.18 - 2.86)	2.61 (2.3 – 2.92)
	Unemployed	2.86 (2.59 - 3.14)	2.82 (2.56 - 3.08)	2.54 (2.27 - 2.81)	2.42 (2.16 - 2.67)	2.56 (2.29 - 2.83)	2.53 (2.28 - 2.77)
	Other	3.10 (2.95 - 3.24)	3.01 (2.88 - 3.15)	2.90 (2.75 - 3.04)	2.61 (2.48 - 2.75)	2.75 (2.60 - 2.89)	2.65 (2.52 - 2.78)
P-value		0.340	0.344	**0.037**	0.485	0.406	**0.014**

Table 3 (continuation)

№		7	8	9	10	11	12
Sources of information		Local radio and TV channels	International radio and TV channels	Mosque representatives and church ministers	Local websites or news pages	Social networks	Celebrities and social media influencers
Female		2.61 (2.50 - 2.70)	2.59 (2.50 - 2.69)	2.56 (2.46 - 2.67)	2.48 (2.39 -2.57)	2.34 (2.25 - 2.43)	2.14 (2.05 - 2.24)
Male		2.57 (2.45 - 2.69)	2.54 (2.43 - 2.66)	2.59(2.47 -2.71)	2.51 (2.40 - 2.62)	2.27 (2.17 -2.38)	2.10 (1.99 - 2.20)
P-value		0.623	0.547	0.765	0.680	0.322	0.525
Urban population		2.53 (2.43 - 2.63)	2.50 (2.40 - 2.59)	2.45 (2.34 - 2.55)	2.46 (2.37 -2.55)	2.25 (2.17 - 2.34)	2.03 (1.94 - 2.12)
Rural population		2.67 (2.54 - 2.80)	2.67 (2.55 - 2.79)	2.76 (2.63 - 2.88)	2.54 (2.43- 2.66)	2.39 (2.27 - 2.50)	2.25 (2.14 - 2.37)
P-value		0.076	**0.027**	**0.0001**	0.256	0.061	**0.002**
Respondents who were vaccinated		2.73 (2.64 - 2.82)	2.69 (2.60 - 2.78)	2.70 (2.60 - 2.79)	2.61 (2.53 - 2.70)	2.42 (2.34 - 2.50)	2.22 (2.14 - 2.31)
Respondents who were not vaccinated		2.24 (2.11 - 2.38)	2.26 (2.13 - 2.39)	2.28 (2.13 - 2.43)	2.20 (2.07 - 2.33)	2.03 (1.90 - 2.15)	1.88 (1.76 - 2.00)
p-value		**<.0001**	**<.0001**	**<.0001**	**<.0001**	**<.0001**	**<.0001**
Age	18–29	2.52 (2.37 - 2.67)	2.63 (2.48 - 2.78)	2.63 (2.47 - 2.78)	2.57 (2.43 - 2.71)	2.37 (2.24 - 2.51)	2.16 (2.02 - 2.29)
	30–44	2.52 (2.39 - 2.66)	2.51 (2.38 - 2.64)	2.60 (2.46 - 2.74)	2.43 (2.31 - 2.56)	2.32 (2.20 - 2.43)	2.12 (2.00 - 2.24)
	45–59	2.67 (2.52 - 2.82)	2.56 (2.41 - 2.71)	2.46 (2.30 - 2.61)	2.51 (2.37 - 2.65)	2.30 (2.17 - 2.43)	2.05 (1.91 - 2.18)
	60 y.o. and older	2.72 (2.52 - 2.92)	2.61 (2.41 - 2.81)	2.64 (2.43 - 2.85)	2.47 (2.28 - 2.65)	2.20 (2.02 - 2.38)	2.21 (2.02 - 2.39)
P-value		0.232	0.619	0.368	0.556	0.512	0.522
Education							
	Higher	2.59 (2.47 - 2.71)	2.67 (2.56 - 2.78)	2.59 (2.46 - 2.71)	2.53 (2.41 - 2.64)	2.38 (2.27 - 2.49)	2.21 (2.11 - 2.32)
	Secondary special	2.60 (2.47 - 2.73)	2.41 (2.29 - 2.53)	2.57 (2.43 - 2.70)	2.51 (2.39 - 2.64)	2.18 (2.06 - 2.30)	1.98 (1.87 - 2.10)
	Secondary	2.57 (2.41 - 2.72)	2.47 (2.33 - 2.62)	2.57 (2.41 - 2.73)	2.42 (2.27 - 2.56)	2.37 (2.23 - 2.50)	2.17 (2.03 - 2.30)
P-value		0.954	0.351	0.982	0.467	**0.032**	**0.015**
Employment status							
	Full-time	2.55 (2.45 - 2.65)	2.54 (2.44- 2.63)	2.55 (2.45 - 2.66)	2.52 (2.43 - 2.62)	2.33 (2.24 - 2.42)	2.12 (2.03 - 2.21)
	Part-time	2.50 (2.16 - 2.84)	2.41 (2.08 - 2.74)	2.52 (2.17 - 2.87)	2.17 (1.86 - 2.49)	2.22 (1.91 - 2.52)	1.98 (1.67 - 2.29)
	Unemployed	2.47 (2.20 - 2.75)	2.42 (2.15 - 2.68)	2.56 (2.28 - 2.84)	2.21 (1.96 - 2.46)	2.26 (2.02 - 2.51)	2.13 (1.88 - 2.37)
	Other	2.71 (2.56 - 2.85)	2.70 (2.56 - 2.84)	2.64 (2.49 - 2.79)	2.57 (2.44 - 2.71)	2.30 (2.173 - 2.43)	2.16 (2.03 - 2.29)
P-value		0.260	0.108	0.788	**0.015**	0.882	0.773

Discussion

Vaccination has made one of the greatest contributions to global health [7] and is considered a key factor in the sanitary resolution of the COVID-19 pandemic [19]. Trust in government policy is an important factor in promoting public compliance and reducing perceived risks during a pandemic, especially the COVID-19 pandemic [2, 24, 10].

The study participants had a low or medium level of trust in the majority of information sources regarding COVID-19. The positive tendency was relatively higher trust in consultations with health professionals, medical institution press releases, and official government press releases.

In our study, the findings showed that trust in healthcare professionals was statistically significantly greater in females compared to males. In an early study on general trust in health information sources, scientists found that, in general, females were significantly more likely to trust health information from all sources, including healthcare professionals for medical information [20]. In a study on COVID-19-related trust, the authors found comparable results, although not statistically significant. In contrast, they reported that males showed much greater support for those who disregarded government guidance than females, although males also demonstrated greater confidence in policy experts [13].

According to the results of our study, education was associated with multiple trust variables. Respondents with more education, and in particular those with at least a bachelor's degree, were more trusting to international websites or news pages, social networks, celebrities, and social media influencers, which is consistent with the findings of other studies [23]. *Verma N. et al.* found that educational attainment had a significant impact on trust in mass media and social media, specifically, education has a positive relationship with trust in mass media and attention to information quality [23]. Contrary to our findings, the Romanian study suggested that education is not a predictor of trust in any source of information [4].

In our study, we found that persons at ages 30-44 and 45-59 trusted more to conversations with family and friends as well as conversations with colleagues. There is a predominance of interpersonal trust meaning that those people trusted other individuals rather than official sources or government and healthcare institutions [11]. In other researches that have studied trust attitudes during a pandemic the age groups 55 years and above were considered mainly due to the vulnerability of older persons [5]. *Jiang N. et al.* in their multi-region study investigated whether social trust is associated with stress [9]. They defined that Japan has the lowest level of trust in government and healthcare and South Korea has the lowest level of neighbor trust which is quite consistent with our data results.

One survey found that physicians and healthcare professionals received the highest level of trust in the rural population, followed by conversations with friends and family, which is consistent with our findings [21].

Consultations with health professionals, medical institution press releases, and official government press releases were positively associated with receiving the COVID-19 vaccine, which is consistent with the findings of other studies [2]. *Ahorsu D.K., et al.* found that trust in the healthcare system mediated the association between generalized trust and willingness to get COVID-19 vaccination, and generalized trust plays a crucial role in influencing individuals to get COVID-19 vaccine directly or indirectly [2]. Studies showed that a lack of trust in healthcare policy is associated with low rates of vaccination, which is consistent with the results of our study [15].

The association found between receiving COVID-19 vaccines and official governmental press releases may well be related to the general trust in government. Earlier studies have shown that lower trust in the national government can lead to vaccine hesitancy [16]. A study conducted in China demonstrated a mediating effect of trust in government in testing the associations between information exposure and vaccine hesitancy [3]. As the authors explain further, the governmental media in China made a positive outlook for the way the country dealt with the COVID-19 pandemic, including extraordinary efforts made on infection control and vaccine invention. Contrary to these findings, a study conducted in the USA suggested that individuals who trust more in government have higher chances of developing vaccine hesitancy [6].

Misinformation on COVID-19 and the COVID-19 vaccines was one of the challenges during the COVID-19 pandemic around the world. Inadequate knowledge about COVID-19 at the start of the pandemic and the need for vaccination within a restricted period accelerated the concerns of the public [16, 3, 6].

This study has several limitations. First of all, the survey was conducted after 2 years since the pandemic started. Secondly, we did not define the trust to respondents, therefore, the trust is defined by themselves and its definition may vary from respondent to respondent. Thirdly, the cross-sectional design of the study allows behavior to be assessed over only one time period. Lastly, we did not assess the interactions between socio-demographic characteristics. Despite these limitations, this study contributes to a deeper understanding of the trust of the Kazakhstani population in different sources of information and allows the results to be used to improve the communication of health measures and vaccination campaigns in the future.

Conclusion

In general, the population of Kazakhstan has a low level of trust in all sources of information about the COVID-19 pandemic. Therefore, constant dialog between trusted healthcare professionals and the community can be an effective strategy to promote healthcare campaigns, including promoting adherence and compliance with preventive regulations and guidance as well as vaccination uptake. Findings are important for understanding the necessary channels of health communication in order to handle health emergency situations in the future.

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