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Mental Health and Migration: Depression, Alcohol Abuse, and Access to Health Care among Migrants in Central Asia

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Abstract

Background—One fifth of Kazakhstan’s population is labor migrants working in poor conditions with limited legal rights. This paper examines self-rated health, mental health and access to health care among migrant workers.

Methods—Using geo-mapping, a random sample of internal and external migrant market workers was selected in Almaty (N=450). We used survey logistic regression adjusted for clustering of workers within stalls.

Results—Almost half of participants described their health as fair or poor and reported not seeing a doctor when needed, 6.2% had clinical depression and 8.7% met criteria for alcohol abuse. Female external migrants were at higher risk for poor health and underutilization of health services. High mobility was associated with depression among internal migrants and with alcohol abuse among female migrant workers.

Conclusions—This study demonstrates the urgent need to address health and mental health needs and improve access to health care among labor migrants in Central Asia.

Keywords

Mental Health; Depression; alcohol abuse; labor migrants; Central Asia; Newly Independent States; Kazakhstan

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INTRODUCTION

Globally, the number of migrants is increasing, with percentages of female migrants and temporary labor migrants growing (1). Over the past decade, Kazakhstan has become one of the world's fastest growing economies in the region (2). In 2010, Kazakhstan, the largest country in Central Asia, was hosting over three million migrants, representing approximately 19.5% of the country's population (1). Following the Russian Federation (12.3 million of migrants) and Ukraine (5.3 million of migrants), Kazakhstan is the third top destination country for international migrants in the Eastern European and Central Asian region, with all three countries hosting 80% of the international migrants in the region (3). Kazakhstan, where over half (54%) of migrant workers are females, is also experiencing feminization of migrant labor along with other destination countries such as Hong Kong SAR, Israel, and Russia (1).

The majority of migrants are coming to Kazakhstan from neighboring Central Asian countries--mainly Kyrgyzstan, Uzbekistan, and Tajikistan--in the search of employment and better life opportunities. Previously, Russia was the primary destination country for labor migrants from Central Asian states that used to be a part of the Soviet Union. In 2005, out of 8 million migrants in Russia from former Soviet Union republics, half were from Central Asian states (4–6). However, with increasing xenophobia in Russia and boosting economy in Kazakhstan, the latter is increasingly becoming a destination country for migrants from Central Asian countries (7). Labor migrants in Central Asia often leave their families in their home countries and support them financially while away (5). Remittance inflow from labor migrants working abroad represents half of Tajikistan's GDP and 28% of GDP in Kyrgyzstan (1). The government of Kazakhstan generally welcomes migrant labor, but working conditions are often poor and migrants face limited social rights and legal protections (7).

In addition to migrants from other countries, there is an influx of internal migrants moving to Almaty, the former capital and country's largest city, for work. Despite economic growth, the development in Kazakhstan has primarily affected larger urban centers and, as a result, residents from rural and more impoverished regions of Kazakhstan started migrating to more prosperous urban locations in an effort to gain employment.

Health, mental health and labor migration

With growing globalization and urbanization, there is an increasing need to understand various aspects of migrant health, including mental health (8). Globally, poor working conditions, limited legal rights, and changing social contexts may expose migrant workers to health risks and hinder their access to health care services. The health status of each migrant worker is impacted by pre-departure conditions, events occurring during and after migration, and return travel (8). Research evidence regarding the impact of employment on health is limited for migrant workers in developing and poor countries (9, 10) and is particularly scarce in the transitional countries of the former Soviet Union region. Although migration may provide economic opportunities, social isolation, being away from families, and living in the fear of migration police due to irregular or illegal immigration status may affect migrants' emotional well-being (11). Temporary migrant workers who experience

employment uncertainty, discrimination, or change of social status, may be particularly at risk for mental health problems and substance use (8). For example, due to a lack of employment opportunities in the post-Soviet era, some intellectuals (e.g., university professors, doctors, teachers) have left former careers in their own countries and became labor migrants to survive through selling items in markets or bazaars (12).

Empirical studies in a number of countries, including the United States, Russia, Germany and other European nations, demonstrated that migrant workers often have less access to health services and care when compared to non-migrants in the same country (6, 13–16). While policy and service structures in Central Asia may differ, similar difficulties in accessing needed services may coincide with language barriers, illegal migration status, and undocumented working conditions. In China, lower levels of health care access among internal migrants compared to permanent residents were related to poorer economic situations, lower levels of education, the requirement to give out-of-pocket payments, and feelings of lower social status (17). The challenges facing internal migrants within China during a time of social and economic transition may also have relevance to Central Asia, a region also undergoing economic growth, urbanization and increasing internal labor migration.

This study draws on the concepts of social capital and social networks to examine the relationship between labor migration and well-being, and access to care. The social capital theory has been previously applied in other studies which examine physical and mental health outcomes among migrant populations (18, 19). Using the social capital theory, we may expect that migrants, with their customary limited social networks, may be more likely to have poor health outcomes as well as limited access to health care (20, 21). Migrants usually access health information through social networks as opposed to formal health care service providers, due to language and access barriers (22). In addition, social trust and supportive social networks within local communities are positively associated with psychological well-being (19).

Research conducted on migrant health within Central Asia is limited. Existing studies of health among migrant workers in Central Asia have primarily focused on their risks to infectious diseases, such as tuberculosis (23, 24) and HIV (25–27). This study represents an initial foray into the area of mental health and health care access among migrant workers in the region. More specifically, the paper examines the relationships between migration status, mobility patterns, and health and mental health outcomes (self-reported health, depression, alcohol abuse, and access to health care) among male and female migrant workers in Kazakhstan.

METHODS

Study Area and Study Population

Respondents were recruited from Barakholka Market, the largest market in Almaty, Kazakhstan, between July – October 2007. The market is located 15 kilometers from the city center, encompasses 28 submarkets divided by various types of goods, and employs about 30,000 vendors. Participants were recruited from the five largest submarkets that have the

greatest number of migrant workers. Geo-mapping was conducted to develop a numbered list of all stalls at these submarkets (5,112 stalls) and 435 stalls were randomly selected from this list. Trained recruiters approached market vendors employed at the selected stalls and screened them for eligibility. In total, recruiters approached 920 vendors, 805 of whom (87.5%) agreed to participate in the screening interview. On average, there were two people employed in each stall. A total of 115 vendors (12.5 %) refused to participate mainly due to “lack of available time” and “no interest.”

To be eligible, a participant had to 1) be at least 18 years old, employed as a worker or owner in a randomly selected stall, and have traveled two or more hours outside of Almaty within the past year and 2) indicate that he or she was not a citizen of Kazakhstan (external migrant) or that he or she maintained a permanent residence two or more hours from Almaty (internal migrant).

Of those screened, about half (N=450, 52.4%) were eligible (225 females and 225 males). To achieve an equal representation among females and males, the following “adaptive biased coin” procedure (28, 29) was employed: once a participant was screened eligible, the probability of being invited to enroll was 100% for participants whose gender was less than 50% of the sample enrolled to date, and the probability for participants whose gender was overrepresented in the sample enrolled to date was reduced from 100% proportionate to the amount of overrepresentation. Screening interviews took place in the stall. Study protocols were approved by the respective university’s IRB and the Ethics Review Board of the Kazakhstan Ministry of Health. Participants were compensated 1,500 Kazakhstani tenge/KZT per interview (equivalent to US\$10).

Measures

Data was collected using interviewer-administered surveys in the study’s private research office in the marketplace approximately two weeks post-screening. The instrument was developed in English, then translated into Russian, and back-translated into English. The instrument was piloted in Russian with 5 female and 5 male market workers.

Socio-demographic covariates included gender, age, education (above or below high school), and marital status (married or not married, which includes single, divorced, and widowed). The country of citizenship, ethnicity (Kazakh or non-Kazakh), religion (Muslim or other), type of residence (owned or family residence vs. rent or non-family residence), and role at the market stall (owner, vendor, or transporter of goods) were measured and included for descriptive purposes. These variables were not included in the regression analysis due to strong associations with the migration status.

Migration and mobility—Migration status is a dichotomous variable defined as ‘internal migrant’ (a citizen of Kazakhstan who maintained a permanent residence two or more hours from Almaty) or ‘external migrant’ (a citizen of another country). Measures of mobility (or frequency of travel) included two variables: the number of times traveled in the past year to visit friends or family and the number of times a respondent traveled outside of Almaty in the past year to buy goods to sell at the market.

Outcome variables

Self-rated health status was measured using a question that asked participants to rate their overall health on a 5-point Likert scale (excellent, very good, good, fair, or poor). This single-item measure has been widely used in prior research examining self-reported health status (30–32), including among migrants (33, 34). The ordinal variable was recoded into dichotomous variables with ‘good/excellent health’ coded as 0 and ‘fair/poor health’ coded as 1.

Access to health care was assessed by two binary variables. Participants were asked 1) if they currently have access to a primary care physician or doctor and 2) if in the past year, they needed to see a doctor for an illness/condition but did not. Both items have been previously utilized in studies examining migrant populations’ access to health care (35, 36).

Depression was measured by the Brief Symptom Inventory, BSI (37, 38). The BSI Depression subscale measured how the participant felt in the past week and included 6 items (e.g., *Thoughts of ending your life*, *Feeling hopeless about the future*) rated on a 5-point scale. The scale demonstrated strong internal consistency ($\alpha = 0.877$). The raw score totals were converted to uniform T-scores with a mean of 50 and a standard deviation of 10 (39). According to the BSI manual, cases that fall above the clinical cut-off score (T-score > 63) were coded as clinically depressed.

Alcohol abuse and/or dependency were assessed by the CAGE questionnaire (40–42), a well-known brief screening tool for alcohol-use disorders. CAGE has also been validated with Russian speaking populations (43–45). This instrument includes 4 questions (*Have you ever felt you should cut down on your drinking?* *Have people annoyed you by criticizing your drinking?* *Have you ever felt bad or guilty about your drinking?* *Eye opener: Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover?*). The CAGE score ≥ 2 denotes problems with alcohol (46).

Data Analysis

The statistical analysis was performed in STATA 12. Most variables were fully observed, or had a small proportion of missing responses (from .03–3.1%). Multivariate analyses were conducted to examine associations between migration status, mobility patterns, and health outcomes, while adjusting for statistically significant socio-demographic covariates (gender, age, education, and marital status). For the regression analysis, both measures of mobility were centered around the mean in order to avoid problems of multicollinearity.

Survey logistic regression was used for four dichotomous outcome variables (poor self-report physical health, depression score above the clinical norm, meeting criteria for alcohol abuse, and not seeing a doctor when needed). Few people ($n=21$) reported having a regular doctor and no regression analysis was performed for this outcome variable. All regression models were adjusted for clustering (nesting) of individuals within stalls introduced by the sampling design. Without specifying sampling design, the analysis may underestimate the standard errors and produce more statistically significant results, running the risk of Type I Error (47). The adjusted odds ratios with associated 95% confidence intervals are reported. The models were tested for multicollinearity, but no evidence was found (48).

RESULTS

Sample Characteristics

The socio-demographic characteristics of the sample and differences by migration status are reported in Table 1. The average age of respondents was 27.7 (SD=4.8) years and the sample was equally split by gender. Out of 450 respondents, over half of respondents (57.3%) had completed high school education (up to 11 years) and an additional 27.3% had completed college or university. The vast majority of participants self-identified as Muslims and 65.1% were married. However, there were significant differences in marital status by gender. Sixteen percent of female migrant workers reported being divorced, widowed or separated compared to 2.2% of male migrant workers. The majority of respondents (86.2%) reported renting or living in a residence owned by someone other than a family member.

Table 2 includes employment and migration characteristics of the sample. Nearly all participants were employed full time in the market and were working as vendors. Over a third of the sample (n=163 or 36.2%) were citizens of Kazakhstan, who were internal migrants—having a permanent residence two or more hours away from Almaty, the city where they worked. External migrants (n=287 or 63.8%) were citizens of other countries, legally or illegally living and working in Kazakhstan. The majority of external migrants were from neighboring Central Asian countries (44.3% were citizens of Kyrgyzstan, 37.6% were citizens of Uzbekistan, and 7.67% citizens of Tajikistan). Among internal migrants (residents of Kazakhstan), over a third was ethnic Kazakhs, a quarter was Dungans (a Muslim minority of Chinese origin living primarily in southeastern Kazakhstan), and other ethnic groups included Uyghurs (10.4%), Russians (4.3%) and Koreans (3.5%). External migrants (non-residents of Kazakhstan) were more likely to identify themselves as Muslim, compared to internal migrants. Significant differences by migration status were also observed in the living arrangements. Only 5.3% of external migrants lived in their own apartment/house or in a residence owned by a family member, compared to 28.8% of internal migrants ($\chi^2=48.77$, $p<.001$).

Mobility was greater among internal migrants (Table 2). Within the past year more internal migrants had travelled to visit friends or family (72.1%), compared to external migrants (31.5%, $\chi^2 = 68.06$, $p<.001$). Internal migrants were also visiting their family members or friends more often in the past year (median = 5 times), compared to external migrants who travelled about two times per year ($t=4.41$, $p<.001$). Furthermore, during the past year more internal migrants travelled to purchase goods to sell in the market than external migrants (41.1% and 31%, respectively, $\chi^2 = 4.68$, $p<.05$).

Health and Mental Health Status

As presented in Table 3, almost half (45.1%) of all participants rated their health status as fair or poor. There were significant differences in self-rated health by migration status. Half of external migrants (50.2%) described their health as poor or fair, compared to 36.2% of internal migrants ($\chi^2 = 8.2$, $p<.01$). Only 4.6% of all respondents reported having a regular physician or doctor. Furthermore, nearly half (45.2%) of the sample reported that in the past

year they needed to see a doctor but did not. About 6.2% of participants scored above the clinical cut-off score for depression and 8.7% of respondents met criteria for alcohol abuse.

Self-reported health—The regression analysis demonstrated that migration status was significantly associated with poor self-reported health (Table 4). After adjusting for gender, age, education, and marital status, external migrants demonstrated significantly higher odds of having poor or fair health (adjusted odds ratio/aOR=1.80, 95% Confidence Interval/CI 1.19, 2.72), compared to internal migrants. The relationship was particularly strong among women; female external migrants were more likely to report poor or fair health (aOR=2.12, 95% CI 1.18, 3.83), compared to female internal migrants. However, travelling to purchase goods to sell at the market was associated with reduced odds of poor self-rated health and the relationship was also stronger among the female sub-sample.

Access to health care—High mobility was significantly associated with limited access to health care. Each additional trip to see family or friends above the sample mean increased the odds of not seeing a doctor when needed (aOR=1.03, 95% CI 1.00, 1.07). High mobility was a significant predictor of poor utilization of health services primarily among men. Among females, migration status was significantly associated with poor utilizing of health care services. Female external migrants were at higher risk of not seeing a doctor when needed, compared to internal migrant women.

Depression—Depression was more prevalent among females, younger, and non-married migrants, as well as among migrant workers with higher levels of education. Marital status was a significant protective factor for depression, particularly among female migrant workers. The effect of mobility on depression differed by migration status. The interaction term demonstrated the opposite effect of mobility for internal and external migrants. Among internal migrants, high mobility was significantly associated with increased odds of depression (aOR=1.09, 95% CI 1.02, 1.17).

Alcohol abuse—Alcohol-related problems were more prevalent among older migrant workers and among migrant men with higher levels of education. Being married was associated with lower odds of alcohol abuse, especially among female migrant workers. Frequent trips to purchase goods were associated with increased odds of alcohol abuse problems, particularly among female migrant workers (aOR=1.12, 95% CI 1.02, 1.22).

DISCUSSION

Almost half of migrant workers in Kazakhstan report poor health status and limited access to health care. The study findings suggest that both migration status and high mobility increase labor migrants' health risks, although differences between experiences of internal and external migrants were apparent. In Kazakhstan, access to health care services is linked to legal residency, which places external migrants at a significant disadvantage. In addition to migration status, high mobility was associated with poor utilization of health care services. This finding suggests that even local citizens, who are legal residents of other regions in Kazakhstan, may be at risk of not receiving proper health care due to the nature of their employment.

Chain migration through networks of friends and relatives is common in Central Asia, and migrant workers are usually connected with other migrants from their ethnic groups or home towns. However, their interactions with other social and professional networks are limited, which may hinder their successful integration into mainstream society and affect their physical and psychological well-being and use of health care. Studies among Latino immigrants in the US (49–51) also demonstrated that environmental and systemic barriers (e.g., health insurance, cost of health care, language barrier) were more commonly reported as barriers to utilization of mental health services than migrants' cultural or individual beliefs (e.g., perception of service effectiveness, stigma, fear of deportation, lack of anonymity). Future studies should examine patterns of utilization and barriers to health and mental health services among migrant workers in Central Asia.

This study also showed that in Kazakhstan, women are more vulnerable for physical and mental health problems associated with labor migration. Female migrant workers who are not residents of Kazakhstan demonstrated significantly poor health outcomes, including poor self-reported health and lower utilization of health services. A study in Spain also identified that health inequalities among migrants are more pronounced among women (52). Migrant women have high rates of poor health (53), and health disparities are particularly prominent among immigrants from poor countries (52).

In this study, six percent of migrant market workers in Kazakhstan have reported clinical depression. Although not small, this number is lower compared to depression level reported in other studies with migrants. Among migrant workers in China, 25% of men and 6% of women met criteria for depression on BSI scale (54). A quarter (25.1%) of migrant workers in the United Arab Emirates scored above the cut-off range for depression using the Depression Anxiety and Stress Scale (DASS-42) (55). A meta-analysis of depression and anxiety among migrant workers internationally found that, on average, the prevalence of depression was lower (14%) in countries with high gross national product/GNP (above 30,000 USD) and higher (31%) in countries with lower GNP (56). Social context, including cultural integration and available social support, language proficiency, and income level satisfaction, impact individual abilities to cope with stressors in the new environment and may be associated with reduced acculturative stress (57–59). A shared history of Soviet Union and common Russian language, strong ethnic networks, geographic proximity, and shared cultural heritage of Central Asia may facilitate adaptation of migrants from other Central Asian countries to Kazakhstan.

However, studies with Mexican immigrants in the US (49) and immigrants from the former Soviet Union in Israel (60) posit that physical health problems or somatic complaints are common manifestations of psychological distress and psychiatric problems among migrant populations. Visits to primary care doctors are often related to mental health concerns, particularly among recent immigrants (49, 61, 62). This may suggest a potential alternative explanation of high rates of physical health problems and low percentage of mental health symptoms reported by migrant workers in this study.

For external migrants, travelling to visit family or friends was marginally associated with lower rates of depression. However, frequency of travels home was predictive of higher

levels of depression among internal migrants, who usually maintain permanent residences in other regions of Kazakhstan and, when compared to external migrants, tend to travel home more often due to proximity, relatively lower costs of travel, and ease of crossing borders. This difference may point to how work at the market is perceived and impacts workers and their families. For external migrants, leaving home to work in Kazakhstan may signify accessing economic and occupational opportunities that are not otherwise available in their home countries. Returning to visit family and friends at home may suggest the worker has adequate resources with which to survive in Kazakhstan, to send home to family, and to utilize for visitation purposes. Alternatively, internal migrants (from other areas of Kazakhstan) may see work at the market in Almaty as less prestigious when compared to other opportunities available in Kazakhstan, and their return visits may involve fewer benefits. This may also be due to poor conditions and stress while travelling, difficulty being away from the temporary home, new social networks, and more comfortable life within Almaty.

Higher levels of travel to purchase goods also predicted alcohol abuse problems, particularly among female migrant workers. Drinking accompanies business interactions in the former Soviet Union space, as alcohol is commonly used to negotiate and celebrate business deals. Kazakhstan and Kyrgyzstan are among traditionally spirits-drinking countries along with Russia, Ukraine and Belarus (63). In Central Asian countries of the Soviet Union, however, drinking among males is about 2–7 times more prevalent than among females. Nevertheless, the study demonstrated that migrant women involved in purchasing and transporting of goods, a traditionally male-dominated field, are at risk of developing alcohol abuse problems.

The study did not identify a health immigrant effect, previously observed in Latino communities in the US and other immigrant groups in Canada, where migrants have better health, including mental health, outcomes when compared to non-migrants (64, 65). The effect appears to be transitory as newcomers adapt to their environment (52) and may result from greater resources among those who migrate in some contexts, or to the underreporting of health conditions among immigrant populations (64).

Due to the cross-sectional nature of this study, temporality and causality cannot be established. Furthermore, the sample did not include non-migrant workers from Almaty city, who also have a large presence in the market. Therefore, the study does not allow us to compare the health status of internal and external migrants to non-migrants. Despite the random sampling approach, the sample may not be representative of all migrant workers employed at the market, and may therefore underrepresent illegal or undocumented migrants. The data was collected for the study primarily focusing on the risks of HIV and Sexually Transmitted Infections (STIs) among migrant workers in Kazakhstan. Therefore, the sample included participants who reported recent sexual activity (in the past 90 days), which may have favored younger adults. Future studies should examine migrant workers involved in other fields populated by migrant workers (construction, agriculture, etc.), focus on other types of mental health problems (e.g., symptoms of trauma, adjustment disorders), and compare the health outcomes of migrant workers to non-migrant population in the host country.

This study demonstrates the need for further research on health and mental health problems and access to health and mental health services among labor migrants in Central Asia. Particular attention should be paid to exploring factors associated with increased risk of health and mental health problems among female migrant workers, including their elevated risk for depression and alcohol abuse. Future studies should also examine the relationship between health outcomes and social networks, the primary sources of help and support for many immigrants, particularly in developing countries (66) and the role of social networks in utilization of health and mental health services among labor migrants. Finally, studies examining the need for and effectiveness of interventions detecting mental health and substance abuse problems among migrant workers at their onset are also warranted.

In conclusion, the findings from this study point to key factors that influence health and mental health outcomes among migrant market workers employed in Almaty, Kazakhstan. While internal and external migrants face unique risks, migration status and high mobility patterns have a significant influence on health and well-being of labor migrants in Central Asia.

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Table 1

Socio-demographic characteristics of the sample.

Variables	Internal Migrants (Residents of Kazakhstan) (n=163)	External Migrants (Non-residents of Kazakhstan) (n=287)	Total (N=450)	t-test/ χ^2
<i>Socio-demographic characteristics</i>				
Frequency, n (Percent, %)				
Age in years, mean (SD)	27.2 (SD=4.7)	28.0 (SD=4.9)	27.7 (SD=4.8)	-1.7
Age in categories				
18-30 years old	102 (62.58)	158 (55.05)	260 (57.78)	2.41
30 and above	61 (37.42)	129 (44.95)	190 (42.22)	
Gender				
Female	84 (51.53)	141 (49.13)	225 (50.00)	0.24
Male	79 (48.47)	146 (50.87)	225 (50.00)	
Education				0.34
Incomplete secondary (< 9 yrs)	27 (16.67)	42 (14.63)	69 (15.33)	
Complete secondary, including high school (11 yrs)	93 (57.41)	165 (57.49)	258 (57.33)	
Higher education	43 (26.38)	80 (27.87)	123 (27.33)	
Religion				7.57**
Muslim	148 (90.80)	287 (96.86)	426 (94.67)	
Other (Christian Orthodox, Buddhism)	15 (9.20)	9 (3.14)	24 (5.33)	
Ethnicity				243.24***
Kazakh	65.0 (39.88)	32 (11.19)	97 (21.60)	
Russian	7 (4.29)	1 (0.35)	8 (1.78)	
Uzbek	1 (0.61)	28 (9.79)	29 (6.46)	
Kyrgyz	1 (0.61)	120 (41.96)	121 (26.95)	
Tajik	1 (0.61)	22 (7.69)	23 (5.12)	
Uighur	17 (10.43)	4 (1.4)	21 (4.68)	
Chinese	2 (1.23)	4 (1.40)	6 (1.34)	
Turkish	7 (4.29)	5 (1.75)	12 (2.67)	
Gypsy/Roma	2 (1.23)	3 (1.05)	5 (1.11)	
Dungha	43 (26.38)	4 (1.4)	47 (10.47)	
Korean	5 (3.07)	0 -	5 (1.11)	

Variables	Internal Migrants (Residents of Kazakhstan) (n=163)	External Migrants (Non-residents of Kazakhstan) (n=287)	Total (N=450)	t-test/ χ^2
Citizenship				
Other	12 (7.36)	63 (22.03)	75 (16.71)	
Kazakhstan	163 (100)	-	163 (36.2)	440.39***
Kyrgyzstan	-	127 (44.25)	127 (28.29)	
Uzbekistan	-	108 (37.63)	108 (24.05)	
Tajikistan	-	22 (7.67)	22 (4.9)	
Other (China, Russia, Turkey, Azerbaijan)	-	30 (10.45)	30 (6.68)	
Marital status				
Married	99 (60.74)	194 (67.60)	293 (65.11)	2.38
Single (never married)	46 (28.22)	70 (24.39)	116 (25.78)	
Divorced, separated, widowed	18 (11.04)	23 (8.01)	41 (9.11)	
Type of residence				
Own or family residence	47 (28.83)	15 (5.23)	62 (13.78)	48.77***
Rent or non-family residence	116 (71.17)	272 (94.77)	383 (86.22)	

p .001,**
p .01

Table 2
Employment, migration and mobility characteristics of internal and external migrant workers in Almaty, Kazakhstan.

Variables	Internal Migrants (Residents of Kazakhstan) (n=163)	External Migrants (Non-residents of Kazakhstan) (n=287)	Total (N=450)	t-test/ χ^2
<i>Employment Characteristics</i>				
Frequency, n (Percent, %)				
Type of employment at market				0.87
Part-time	5 (3.11)	5 (1.75)	10 (2.24)	
Full-time	156 (96.89)	281 (98.25)	437 (97.76)	
Role at the market				
Owner	15 (9.32)	23 (8.01)	38 (8.48)	0.23
Vendor	155 (96.27)	273 (95.12)	428 (95.54)	0.32
Transporter of goods	1 (0.62)	7 (2.44)	8 (1.79)	1.94
<i>Migration and Mobility Characteristics</i>				
Frequency, n (Percent, %)				
Migration status				n/a
internal migrant	163 (36.22)	0 -	163 (36.22)	
external migrant	0 -	287 (63.78)	287 (63.78)	
Respondent traveled to visit family or friends in the past year				68.06***
Number of times traveled to visit family or friends, mean (SD)	116 (72.05)	89 (31.45)	205 (46.17)	
median (min/max)	6.46 (6.23)	3.71 (6.39)	4.71 (6.46)	4.41***
Respondent traveled to purchase goods to sell at the market in the past year				4.68*
Number of times traveled to purchase goods to sell at the market, mean (SD)	5 (0/50)	2 (0/50)	2 (0/50)	
median (min/max)	67 (41.10)	88 (30.99)	155 (34.68)	
Number of times traveled to purchase goods to sell at the market, mean (SD)	2.08 (3.17)	2.37 (5.70)	2.27 (4.93)	-0.61
median (min/max)	0 (0/15)	0 (0/52)	0 (0/52)	

p .001,

*
p .05

Table 3

Health and mental health outcomes among internal and external migrant workers in Almaty, Kazakhstan.

Health outcomes	Internal Migrants (Residents of Kazakhstan) (n=163)	External Migrants (Non-residents of Kazakhstan) (n=287)	Total Sample (N=450)	t-test/Chi²
	Frequency (Percent, %)			
Self-rated health				8.20**
Good/very good/excellent	104 63.80	143 49.83	247 (54.89%)	
Poor/fair	59 36.20	144 50.17	203 (45.11%)	
Have a regular doctor				1.25
No	152 (93.83)	275 (96.15)	427 (95.31)	
Yes	10 (6.17)	11 (3.85)	21 (4.69)	
In the past year, needed to see doctor for an illness or condition, but didn't				0.69
No	93 (57.41)	152 (53.33)	245 (54.81)	
Yes	69 (42.59)	133 (46.67)	202 (45.19)	
Depression				1.35
No	150 (92.02)	272 (94.77)	422 (93.78)	
Yes	13 (7.98%)	15 (5.23)	28 (6.22)	
Alcohol dependence (CAGE)				0.0
No alcohol problem	149 (91.41)	262 (91.29)	411 (91.33)	
Has alcohol problem	14 (8.59)	25 (8.71)	39 (8.67)	

**
p .01

Table 4

Mixed effects regression results for migration, mobility and health outcomes among migrant workers

Variables	Odds Ratios [95% Confidence Intervals]									
	Model 1		Model 2		Model 3		Model 4		Model 4	
	Poor self-rated health		Needed to see a doctor, but didn't		Depression		Alcohol Abuse		Alcohol Abuse	
	TOTAL	Male	Female	TOTAL	Male	Female	TOTAL	Male	Female	Female
Socio-demographic characteristics										
Gender										
male	ref	n/a	n/a	ref	n/a	n/a	ref	n/a	n/a	n/a
female	1.45 (0.99 – 2.12)			4.79 *** (3.12 – 7.34)			5.38 *** (1.92 – 15.10)			
Age										
18–30	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
30 and above	1.10 (0.73 – 1.66)	0.95 (0.48 – 1.88)	1.57 (0.89 – 2.76)	1.19 (0.77 – 1.83)	1.42 (0.70 – 2.88)	1.18 (0.66 – 2.11)	0.37 * (0.15 – 0.93)	2.45 * (1.13 – 5.31)	0.43 (0.14 – 1.30)	2.01 (0.70 – 5.75)
Marital Status										
non-married	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
married	0.74 (0.48 – 1.15)	0.56 (0.30 – 1.05)	1.26 (0.66 – 2.41)	0.81 (0.53 – 1.25)	0.63 (0.31 – 1.26)	0.90 (0.49 – 1.66)	0.15 *** (0.06 – 0.41)	0.43 * (0.21 – 0.88)	0.09 *** (0.03 – 0.30)	0.19 *** (0.06 – 0.59)
Education										
High school or below	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Above high school	1.20 (0.77 – 1.86)	1.01 (0.52 – 1.98)	1.38 (0.72 – 2.62)	1.28 (0.80 – 2.05)	1.27 (0.63 – 2.58)	1.29 (0.68 – 2.45)	2.42 * (1.11 – 5.24)	3.13 * (1.31 – 7.46)	2.53 * (1.01 – 6.29)	0.90 (0.27 – 3.00)
Migration and Mobility Variables										
Migration status										
internal migrant	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref

Variables	Odds Ratios [95% Confidence Intervals]											
	Model 1			Model 2			Model 3			Model 4		
	Poor self-rated health			Needed to see a doctor, but didn't			Depression			Alcohol Abuse		
	TOTAL	Male	Female	TOTAL	Male	Female	TOTAL	Male	Female	TOTAL	Male	Female
external migrant	1.80 ^{**} (1.19 – 2.72)	1.35 (0.65 – 2.80)	2.12 [*] (1.18 – 3.83)	1.43 (0.93–2.20)	1.06 (0.56 – 2.01)	1.79 [*] (1.01 – 3.16)	1.02 (0.42 – 2.44)	0.71 (0.07 – 7.15)	0.91 (0.76 – 1.09)	1.0 (0.49 – 2.03)	1.17 (0.43 – 3.18)	0.71 (0.23 – 2.26)
Frequency of traveling to visit family or friends	0.99 (0.95 – 1.02)	0.95 (0.85 – 1.05)	1.07 [†] (0.99 – 1.16)	1.03 [*] (1.00 – 1.07)	1.03 [*] (1.00 – 1.07)	1.04 (0.97 – 1.12)	1.09 [*] (1.02 – 1.17)	1.07 [†] (1.00 – 1.15)	1.1 (0.36 – 3.35)	1.02 (0.98 – 1.05)	0.99 (0.94 – 1.04)	1.06 (0.98 – 1.14)
Migration Status (external migrant) * Frequency of traveling to visit family or friends Interaction	-	-	-	-	-	-	0.92 [†] (0.84 – 1.01)	0.85 (0.57 – 1.27)	1.03 (0.96 – 1.10)	-	-	-
Frequency of traveling to purchase goods to sell at the market	0.92 [*] (0.85 – 0.98)	0.94 (0.87 – 1.01)	0.89 ^{**} (0.81 – 0.97)	0.99 (0.94 – 1.04)	1.01 (0.96 – 1.07)	0.96 (0.91 – 1.02)	1.03 (0.99 – 1.08)	1.03 (0.95 – 1.12)	1.1 (0.94 – 1.30)	1.05 ^{**} (1.00 – 1.10)	1 (0.91 – 1.10)	1.12 ^{**} (1.02 – 1.22)
Constant	0.50 ^{***} (0.31 – 0.81)	0.86 (0.14 – 5.40)	0.37 ^{***} (0.18 – 0.76)	0.28 ^{***} (0.17 – 0.48)	0.38 ^{**} (0.19 – 0.75)	1.11 (0.57 – 2.16)	0.05 ^{***} (0.02 – 0.15)	0.1 (0.00 – 3.85)	0.30 ^{**} (0.13 – 0.70)	0.11 ^{***} (0.05 – 0.22)	0.05 ^{***} (0.02 – 0.16)	0.13 ^{***} (0.04 – 0.42)
Number of observations	441	220	221	438	219	219	441	220	221	441	220	221

p .001,
**
p .01,
*
p .05,
†
p .1