Effect of lockdown on mental health during the COVID-19 pandemic among individuals attending services at a tertiary care center

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ABSTRACT

Background: Lockdown is an emergency measure or condition in which people are temporarily prevented from entering or leaving a restricted area or building during a threat or danger. Since the start of COVID-19 till date, almost one-third of the world’s population is under some degree of restriction and lockdown, and the mental health effect of which is something that is being discussed widely.

Aim: The study aimed to assess the effect of lockdown on mental health among individuals (patients or accompanying person) seeking services at a tertiary care center.

Materials and Methods: Kathmandu Medical College is a tertiary care center and a medical college in Kathmandu, Nepal. In this study, we enrolled every 4th individual coming to the hospital’s outpatient department registration counter to seek service and giving consent, for the duration of 1 month during the ongoing lockdown period. A semi-structured questionnaire was developed and approved by the department and was used to collect sociodemographic details and to rate the stress level. The General Health Questionnaire (GHQ-12) Nepali version was used to assess psychological well-being of the participants and a score of $\geq3$ by binary method was taken as positive case.

Results: The total number of cases enrolled in the study was 204, out of them 62.2% were male and 32.8% were female and the mean age was 32.03 years. Twenty-three percent (23.5%) had preexisting health conditions. Out of the 204 participants, 67.6% said they were stressed following the lockdown and the mean rated stress was 2.90 in a scale ranging from 1 to 7. The frequently identified stressors were fear of contamination, restricted movement, and for inadequate supplies. Twenty-seven percent said they had some psychological symptoms and the most common symptoms were palpitation and sleep disturbance. Seventy-three individuals (36.5%) were found to have psychiatric problem according to their scores in GHQ-12. Rated stress and GHQ-12 scores were found to be strongly correlated ($P = 0.000$). Similarly, those who stated “Yes” in psychological symptoms significantly scored higher on GHQ-12 and stress (both $P = 0.000$).

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INTRODUCTION

In late December 2019, a cluster of pneumonia-like disease was first reported in Wuhan, China. After few days, the causative agent of this pneumonia was identified to be novel coronavirus (n-CoV), and it was renamed as coronavirus disease 2019.[1] Since the report of the first case, the infection has spread to more than 9.8 million cases worldwide as of June 28, 2020.[2] It has spread rapidly all around the world, involving 216 countries and in March 2020, the World Health Organization declared it as pandemic and proclaimed Europe to be the epicenter.[3] The total number of cases as of June 28, 2020, is 9,843,073, and the death toll has reached 495,760.[2] Nepal has seen a recent surge in the number of cases, and there are currently 12,772 cases and 28 deaths and the total number of cases recovered is 3013 as of June 28, 2020.[4]

China was the first country to implement lockdown to restrict the spread of infection. Lockdown is defined as an emergency measure in which the movement of people is temporarily restricted during a threat of danger.[4] Quarantine is the separation and restriction of movement of potentially exposed people to a contagious disease, thus reducing their risk of infecting others, whereas isolation is the separation of those who have already been diagnosed with a contagious disease from those who aren’t sick.[5] Although these three terms have different meanings, the common factor is restriction. Currently, due to COVID-19, it is estimated that around 2.6 billion people worldwide, which account for one-third of the world’s population, are under some sort of restriction and lockdown.[6] As fear and uncertainty rise along with the surge of cases, it is inadvertently affecting the mental health of the individuals. A recent review on the psychological impact of quarantine during the SARS pandemic published in the Lancet showed a wide range of mental health impact ranging from stress, insomnia, anger, and emotional exhaustion to depression, anxiety, and posttraumatic stress disorder (PTSD). According to the same study, low mood and irritability were the most common symptoms experienced.[7]

The Government of Nepal has implemented a nationwide lockdown since March 24, 2020, along with shutting down of all schools, offices, businesses, and public places except for hospitals, and people are advised to self-isolate during this period. In the context of Nepal, the lockdown and isolation can also precipitate a range of psychological reactions such as increased anxiety, stress, irritability level, low mood, and fears (based on real or perceived threat); such emotional conditions negatively impact an individual’s functional state, both physical and mental.

In this context of the ongoing lockdown, the current study was undertaken at Kathmandu Medical College, Kathmandu (KTM), Nepal, among individuals who came to seek health-care services from this tertiary care center. This study mainly aims at assessing the impact of lockdown on an individual’s mental health.

MATERIALS AND METHODS

It was a simple randomized, cross-sectional study undertaken by the Department of Psychiatry of Kathmandu Medical College, KTM, Nepal, from May 1, to May 30, 2020. The study was undertaken after seeking ethical clearance from the Institutional Review Committee. Every fourth individual who came to the hospital’s outpatient department counter to seek health-care facilities, irrespective of being either the patient himself/herself or as accompanying person of the patient and irrespective of which department they were seeking help from, were enrolled into the study. Individuals under the age of 18 were excluded from the study. A total of 204 individuals were enrolled into the study. A written consent was taken from each enrolled individual. A semi-structured pro forma, developed and approved by the department, was administered to obtain sociodemographic details such as age, sex, place of stay during lockdown, mode of income, and occupation. The details regarding level of stress experienced, types of stressors, and presence of any new psychological symptoms following the lockdown were noted.

General Health Questionnaire 12 (GHQ-12), Nepali version, was used in the study. GHQ-12 was developed by Goldberg in the 1970s and since then has been a preferred measure of current mental health.[8] It has been translated and validated in different languages including Nepali.[9] GHQ has a sensitivity of 85.58% and a specificity of 74.79%. Its positive and negative predictive values in Nepalese population are 86.66% and 85%, respectively. There are 12 items, and each item has four possible responses, “not at all,” “no more than usual,” “rather more than usual,” and “much more than usual.” The scores of GHQ-12 can be interpreted either

**Conclusion:** The lockdown has caused stress in majority of cases, and a significant number of individuals have diagnosable mental health conditions. Mental health impact of the lockdown is something that needs to be addressed seriously.

**Key words:** COVID-19, General Health Questionnaire-12, lockdown, mental health, stress
by “Likert scale” method or by “binary scoring” method. In the Likert scoring method, the score ranges from 0 to 3 (referred to as 0-1-2-3 method). In the binary system, the two least symptomatic responses score 0, and the two most symptomatic responses score 1 (referred to as 0-0-1-1 method). In the binary system of scoring, the mean is regarded as the cutoff point in most of the studies. In our study, however the male population was more likely to consume alcohol and reported to have increased the amount during the lockdown, which was statistically significant. Out of 95 individuals who consumed alcohol, 42 (44.2%) reported an increase in their amount of alcohol consumption, 59 (62.1%) responded to having a higher level of stress (≥4), and 54 (56.8%) showed a higher GHQ score (≥3).

The level of stress was found to be similar among those staying with family members and those living alone. It was found that those whose permanent residence was out of KTM valley and were at their temporary residence during the lockdown experienced more stress than those staying at their home (P < 0.01). In comparison to other occupations, health-care professionals, security personnel, and business owners were found to have higher level of stress. The stress level was found to be similar among both patients and the accompanying persons. Although not statistically significant, those individuals who had preexisting health conditions (physical or mental) experienced higher level of stress as compared to those not having preexisting health condition (64.4% vs. 35.4%). Among the 48 individuals who reported having preexisting health conditions, 31 (64.6%) responded “Yes” to having stress, 15 (31.3%) experienced psychological symptoms, and 21 (43.8%) scored a high (≥3) on GHQ. Out of 15 individuals who reported to have experienced recent exacerbation, 10 (66.7%) mentioned having high level of stress (≥4) and 12 (80%) scored a high GHQ (≥3). Nine of them (60%) also reported of being experiencing psychological symptoms.

It was found that the recent exacerbation of symptoms was significantly associated with stress level (P < 0.01), GHQ-12 scores (P < 0.01), and psychological symptoms (P < 0.01), as presented in Table 2.

Among the total enrolled, 66.7% of the sample experienced stress and the most common stressors reported were fear of contamination (89 [24.4%]), restricted movement (74 [20.3%]), uncertainty about the length of lockdown (52 [14.2%]), low income (38 [10.4%]) and inadequate supplies (34 [9.3%]), lack of accessibility (26 [7.1%]), inadequate information (22 [6%]), and others (16 [4.4%]). Among the psychological symptoms, the most commonly reported symptoms were sleep disturbances (45 [26.6%]), changes in appetite (26 [15.4%]), palpitation (23 [13.6%]), fear (20 [11.8%]), anger/irritability (19 [11.2%]), restlessness (17 [10.1%]), sadness (15 [8.9%]), and others (4 [2.4%]).

Spearman’s rho correlations were calculated among the variables with continuous data. Stress rated from 1 to 7 statistically significantly correlated with GHQ-12 scores (P<0.01), number of psychological symptoms (P < 0.01), and number of stressors (P < 0.01). The data are presented in Table 3.

RESULTS

A total of 204 cases were enrolled in this study; among them, 137 (66.8%) were male and 67 (33.2%) were female. The mean age of the participants was 32.03 ± 10.897 years. Among the participants, majority (124 [60.8%]) were permanent residents of KTM valley, whereas the remaining were temporary residents. One hundred and seventy-three individuals (84.8%) were living with their families during the lockdown period and the remaining were living alone. Among the 204 enrolled participants, 126 (61.8%) were the accompanying person and the remaining 78 (38.2%) were patients visiting the hospital due to various reasons. Majority of the cases were into service and business (19.6% each), followed by homemakers (18.1%). Frontline workers that included health professionals and security personnel constituted 11.7% (24) of the total individuals. For majority of cases, the mode of income was monthly salary (43.6%). The details of other sociodemographic variables are provided in Table 1.

Among the total population, 92 (45.1%) scored ≥3 and 112 (54.9%) scored <3 on GHQ-12. A total of 138 (67.6%) cases reported experiencing stress and 79 (38.7%) scored ≥3 on GHQ-12 and fell into “high scorers.” One hundred and thirty-six (66.7%) participants had a count of more than one stressor and 68 (33.3%) reported as experiencing one or more psychological symptoms. The mean comparisons of stress and GHQ scores are presented in Table 2.

Age was categorized into three subgroups, 18–25 years, 26–50 year, and 51 years and more. The age group 26–50 which constituted of 121 participants experienced higher level of stress as compared to other age groups, though not statistically significant. We did not find any significant difference in the experience of stress by males and females.
DISCUSSION

In this era of COVID-19, we are finding a plethora of important researches emerging which are trying to make sense of the effects of this pandemic on many different areas of human life, society, and culture. The most important concern nowadays is regarding the effect of this pandemic on mental health of the population at large.

There are several studies conducted which show that phenomena such as quarantine, isolation, and social distancing have an impact on the psychological

Table 1: Important variables with their $\chi^2$ values with their General Health Questionnaire scores and stress rated (1–7)

| Variables                      | GHQ scores | $\chi^2$ (P) | Level of stress | $\chi^2$ (P) |
|--------------------------------|------------|--------------|-----------------|--------------|
|                                | 0-2 (%)    | >3 (%)       | No stress (%)   | Low stress (%) | High stress (%) |
|                                |            |              |                 |              |                |
| Age                            |            |              |                 |              |                |
| 18-25                          | 37 (18.1)  | 30 (14.7)    | 0.444 (0.801)   | 23 (11.3)    | 17 (8.3)       | 27 (13.2)      | 7.304 (0.121)  |
| 26-50                          | 65 (31.9)  | 56 (27.5)    | 3 (16.7)        | 40 (19.6)    | 47 (23)        |                |                |
| 51 and more                    | 10 (4.9)   | 6 (2.9)      | 9 (4.4)         | 5 (2.5)      | 2 (1.0)        |                |                |
| Sex                            |            |              |                 |              |                |
| Male                           | 78 (38.2)  | 59 (28.9)    | 47 (23.0)       | 46 (22.5)    | 44 (21.6)      |                | 4.840 (0.089)  |
| Female                         | 34 (16.7)  | 33 (16.2)    | 19 (9.3)        | 16 (7.8)     | 32 (15.7)      |                |                |
| Permanent residence            |            |              |                 |              |                |
| Inside KTM valley              | 72 (35.3)  | 52 (25.5)    | 1.277 (0.313)   | 50 (24.5)    | 38 (18.6)      | 36 (17.6)      | 11.953 (0.003) |
| Outside KTM valley             | 40 (19.6)  | 40 (19.6)    | 16 (7.8)        | 24 (11.8)    | 40 (19.6)      |                |                |
| Where were you during lockdown?|            |              |                 |              |                |
| In my permanent address (KTM Valley) | 70 (34.3) | 50 (24.5)    | 1.386 (0.255)   | 48 (23.5)    | 38 (18.6)      | 34 (16.7)      | 11.650 (0.003) |
| In my temporary residence (outside KTM valley) | 42 (20.6) | 42 (20.6)    | 18 (8.8)        | 24 (11.8)    | 42 (20.6)      |                |                |
| Were you living with your family members during lockdown? |            |              |                 |              |                |
| Yes                            | 97 (47.5)  | 76 (37.3)    | 0.627 (0.441)   | 59 (28.9)    | 53 (26.0)      | 61 (29.9)      | 2.317 (0.314)  |
| No                             | 15 (7.4)   | 16 (7.8)     | 7 (3.4)         | 9 (4.4)      | 15 (7.4)       |                |                |
| Occupation                     |            |              |                 |              |                |
| Business owner                 | 22 (10.8)  | 18 (8.8)     | 5.139 (0.526)   | 10 (4.9)     | 13 (6.4)       | 17 (8.3)       | 18.292 (0.107) |
| Service                        | 25 (12.3)  | 15 (7.4)     | 16 (7.8)        | 13 (6.4)     | 11 (5.4)       |                |                |
| Homemaker                      | 18 (8.8)   | 19 (9.3)     | 11 (5.4)        | 9 (4.4)      | 17 (8.3)       |                |                |
| Student                        | 18 (8.8)   | 8 (3.9)      | 11 (5.4)        | 7 (3.4)      | 8 (3.9)        |                |                |
| Health professional            | 7 (3.4)    | 9 (4.4)      | 4 (2.0)         | 1 (0.5)      | 11 (5.4)       |                |                |
| Security personnel             | 4 (2.0)    | 4 (2.0)      | 2 (1.0)         | 5 (2.5)      | 1 (0.5)        |                |                |
| Others                         | 18 (8.8)   | 19 (9.3)     | 12 (5.9)        | 14 (6.9)     | 11 (5.4)       |                |                |
| Preexisting health condition   |            |              |                 |              |                |
| Yes                            | 27 (13.2)  | 21 (10.3)    | 0.046 (0.869)   | 17 (8.3)     | 14 (6.9)       | 17 (8.3)       | 0.270 (0.874)  |
| No                             | 85 (41.7)  | 71 (34.8)    | 49 (24.04)      | 48 (23.5)    | 59 (28.9)      |                |                |
| Recent exacerbation            |            |              |                 |              |                |
| Yes                            | 3 (1.5)    | 12 (5.9)     | 7.966 (0.006)   | 2 (1.0)      | 3 (1.5)        | 10 (4.9)       | 6.145 (0.046)  |
| No                             | 109 (53.4) | 80 (39.2)    | 64 (31.4)       | 59 (28.9)    | 66 (32.4)      |                |                |
| Do you feel stressed?          |            |              |                 |              |                |
| Yes                            | 59         | 79           | 25.425 (0.000)  | 0 (0.0)      | 62 (30.4)      | 76 (37.3)      | 204.000 (0.000) |
| No                             | 53         | 13           | 66 (32.4)       | 0 (0.0)      | 0 (0.0)        |                |                |
| Number of psychological symptoms reported |      |              |                 |              |                |
| 0-3                            | 110 (53.9) | 72 (35.3)    | 20.901 (0.000)  | 65 (31.9)    | 58 (28.4)      | 59 (28.9)      | 17.703 (0.000) |
| 4-6                            | 2 (1.0)    | 20 (9.8)     | 1 (0.5)         | 4 (2.0)      | 17 (8.3)       |                |                |
| Did you experience any psychological symptoms? |      |              |                 |              |                |
| Yes                            | 10 (4.9)   | 45 (22.2)    | 40.552 (0.000)  | 1 (0.05)     | 10 (4.9)       | 44 (21.7)      | 61.898 (0.000) |
| No                             | 101 (49.8) | 47 (23.2)    | 65 (32)         | 51 (25.1)    | 32 (15.8)      |                |                |
| Use of alcohol                 |            |              |                 |              |                |
| Yes                            | 54 (26.5)  | 41 (20.1)    | 0.270 (0.673)   | 28 (13.7)    | 31 (15.2)      | 36 (17.6)      | 0.769 (0.681)  |
| No                             | 58 (28.4)  | 51 (25.0)    | 38 (18.6)       | 31 (15.2)    | 40 (19.6)      |                |                |
| Has there been any increase in the amount of alcohol consumption? |      |              |                 |              |                |
| Yes                            | 31 (15.2)  | 14 (6.9)     | 15 (7.4)        | 13 (6.4)     | 17 (8.3)       |                | 4.488 (0.344)  |
| No                             | 25 (12.3)  | 30 (14.7)    | 12 (5.9)        | 21 (10.3)    | 22 (10.8)      |                |                |
| Number of symptoms identified  |            |              |                 |              |                |
| 0-3                            | 110        | 72           | 20.901 (0.000)  | 65 (31.9)    | 58 (28.4)      | 59 (28.9)      | 8.712 (0.003)  |
| 4-6                            | 2          | 20           | 1 (0.5)         | 4 (2.0)      | 17 (8.3)       |                |                |

GHQ – General Health Questionnaire, KTM – Kathmandu
The widespread lockdown is bound to have a psychological impact on an individual, regardless of whether the outbreak is controlled or not. The authors remark that fear seems to be certain as an effect of mass quarantine and anxiety is most likely to escalate which is also true for our study.[11]

There have been reports that anxiety, fear, frustration, loneliness, anger, boredom, depression, stress, and avoidance behaviors are commonly associated with restrictive measures such as quarantine and lockdown.[12] A peculiar syndrome known as “Headline Stress Disorder” has been conceptualized which can be observed during the modern pandemics and is characterized by high emotional response, such as stress and anxiety, to endless reports from the news media, that may cause physical symptoms including palpitation and insomnia, which can further progress to physical and mental disorders.[13]

The lockdown has also created a scenario in which people were bound in their homes and could not go out and thus were left to fear about their important work and unfinished businesses. At one point, there was panic buying and people started hoarding grocery items as it was not definite when the lockdown would end. This was a situation which generated an extreme level of fear in the general public which was aggravated by the rate of increasing infections in different countries alongside increasing mortality rates. In multiple studies as quoted in a review article, it was reported that fear of being infected or infecting others was one of the common stressors during quarantine.[7]
of chronic health problems and mental health, and increased use of tobacco and/or alcohol and other substances.\textsuperscript{[13]}

In the current study, it was found that most individuals had sleep disturbance, appetite changes, palpitation, anger/irritability, and restlessness. A review article that assessed the psychological impact of quarantine reported insomnia, exhaustion, anxiety symptoms, and irritability as some of the commonly experienced psychological symptoms.\textsuperscript{[7]} Heightened levels of stress and anxiety as stated above would definitely give rise to symptoms. The authors also came across cases suffering from insomnia and general unease and fear during their day-to-day practice.

The most important finding in our study was that level of stress and GHQ-12 scores were associated with many variables, some significantly and some not. High scorers in GHQ-12 also reported higher level of stress. It was seen that higher level of stress and higher GHQ-12 scores were predictors of number of stressors and psychological symptoms. Restrictions which are a part of lockdown can precipitate a range of psychological symptoms including loneliness, denial, anger, anxiety, insomnia, and despair.\textsuperscript{[16,17]}

In this study, the significant correlation of demographic variables and stress and GHQ scores was mixed. The results regarding demographic and psychological symptoms were found to be mixed in previous studies as well.\textsuperscript{[7,12,18,19]} A study done in China during COVID-19 and another study done in Canada during SARS reported no significant association among psychological symptoms with demographic variables such as age, sex, and education level. However, a study conducted in the UK and another study conducted during SARS reported that lower level of formal education, female gender, and younger age were predictors of stress and psychological symptoms.\textsuperscript{[12]} Furthermore, anxiety and stress related to COVID-19, a potentially life-threatening condition, can arouse a significant amount of stress in anyone, irrespective of caste or creed.

In this study, the age group of 26–50 years experienced higher level of stress as compared to other age groups. Two different studies conducted in the UK and China independently found that age groups 25–45 and 21–30 were indicators of poor mental health, respectively, compared to other age groups.\textsuperscript{[18,20]} However, another study reported that there was no significant difference in the stress level experienced among different age groups.\textsuperscript{[19]} Though not statistically significant in our study, the age group 26–50 reported more stress, which might be due to the possibility that this age group is the prime age where individuals have to bear most responsibilities; financial, social, and educational etc., and is very likely to be intensified by the lockdown, causing increased level of stress.

In terms of stress and GHQ scores, the current study did not find any significant difference in stress level experienced by males and females. However, looking into the high scorers of stress, 32 females (47.76%) out of 67 had scored relatively higher than 44 males (32.12%) out of 137.

An article on Forbes reports that males are less likely to report that they are “very concerned” about COVID-19 (54% female vs. 45% males).\textsuperscript{[21]} The article reasons it to be because of societal pressure for males to be emotionally stable. Men are taught to be strong and brave and stress is seen as a sign of weakness. It has also been reported that men are less likely to seek out health-related help.\textsuperscript{[22]} In contrast, females are more vocal about their feelings and are more comfortable expressing their vulnerability. Being mothers to children and staying mostly inside their homes, they are more likely to get stressed about the well-being of their children and family, which might be another reason why female reported more stress in our study.

The male population was more likely to consume alcohol in this study and reported to have increased the amount during the lockdown, which was statistically significant ($p < 0.01$).

This complements the finding that males were relatively more stressed than they expressed and hence were consuming more alcohol than females. Alcohol consumption can also be a coping mechanism. A study in China has similar findings in which males were six times more likely to consume alcohol in harmful use and dependent pattern.\textsuperscript{[20]}

The level of stress was found to be similar among those staying with family members and those living alone. However, it was found that those whose permanent residence was out of KTM valley but were living in KTM as temporary residents experienced more stress than those staying at their home ($p < 0.01$). Individuals permanently residing in KTM valley, being at their own home, were financially secure and had a strong social support. Moreover, those migrating from other parts of Nepal to KTM valley usually have to stay at rented homes, have to earn for themselves, and have less social and familial support, which make them more vulnerable to stress than those who are permanent residents of KTM valley.

In comparison to other occupations, health-care professionals, security personnel, and business owners were found to have higher level of stress. The stress level was found to be similar among those visiting the hospital as patients and as accompanying persons. A study published in The Lancet reports that health professionals working during the lockdown had more PTSD-like stress symptoms. They were more likely to suffer from depression, anxiety, fear, and frustration.\textsuperscript{[17]} This might be due to the fact that health and security personnel are directly involved in dealing with COVID scenarios and business owners might have been experiencing financial burden due to the lockdown.
In this study, it was found that those individuals who had previous health conditions (physical or mental) experienced higher level of stress and scored higher on GHQ-12 than their counterparts. Though not statistically significant, this is a major finding in the study. A UK-based study found that presence of multimorbidity was one of the predictors of poor mental health in their sample population.\[18\] This might be due to the general knowledge disseminated that those who had preexisting health conditions were more likely to have severe form of COVID and even the fact that mortality rate was higher in these groups. The other possible reason might be that they were worried about interrupted access to health-care facility during the current pandemic.

**CONCLUSION**

The study was conducted in the context of COVID-19 lockdown and the impact it had on different variables. A simple randomized study was conducted in Kathmandu Medical College on patients and/or their accompanying persons visiting for hospital services. A total of 204 individuals were enrolled in the study. The most important predictors of stress were being in health-care profession, age group 26–50, females, and having a preexisting health condition. Stress was found to be significantly more on residents who migrated to KTM from other parts of Nepal. Those who had some kind of physical or mental illness prior to being enrolled into the study reported significant exacerbation in their symptoms. Males were more likely to consume alcohol and they reported an increase in the amount of alcohol consumed. The most frequently reported psychological symptoms were sleep disturbances, changes in appetite, and palpitation, whereas the most frequently reported stressors were fear of contamination, restricted movement, and uncertainty about the length of lockdown.

As the lockdown seems to be stressful and can precipitate new symptoms and exacerbate the existing health conditions, it is imperative that measures be taken in order to manage the stress such as lifestyle modification, spending less time on collecting news regarding lockdown, and creating a space for more interaction with family members and engaging in recreational activities. One of the findings in the study was that individuals whose permanent address was out of KTM valley but staying at KTM in order to earn their living were more stressed, thus it is very important for the governmental and nongovernmental agencies either to support them financially or take measures to unite them with their family members.

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**Conflicts of interest**

There are no conflicts of interest.

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