The prevalence and the predictors of insomnia among refugees

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Abstract
This study aimed to investigate the prevalence of insomnia and associated sociodemographic factors among refugees in Jordan. A cross-sectional survey was undertaken with a representative sample of 373 refugees. The majority of refugees had moderate to severe insomnia (n = 196, 52.2%). Older age, living in the city of Mafraq, having secondary education or below, unemployed, and lacking easy access to medication were the predictors of higher insomnia. More attention by health care providers including nurses should be given to older refugees and those with a lower level of education, as these groups tend to be more liable to suffer from insomnia.

Keywords
availability of medication, educational level, insomnia, refugees, unemployment

Background and literature review
Insomnia is defined as inability or difficulty in initiating and/or maintaining sleep, associated with day-time functional impairment and/or behavioral problems and occurring three times a week (Benbir et al., 2015; Sateia, 2014). There is extensive evidence linking sleep impairment with poor health. Insomnia is one of the most prevalent types of sleep disturbance. Approximately 30 percent of public experienced occasional insomnia that lasts less than 3 months and between 5 and 15 percent suffered from chronic insomnia that lasts 3 months or longer (Morin and Benca, 2012; Morin and Jarrin, 2013; Roth, 2007). Insomnia can also be a potentially dangerous condition, as it may lead to overuse of medication by the individual, as well as being costly for health care services (Daley et al., 2009).

A number of environmental, psycho-social, and biological variables have been linked to insomnia. Insomnia is associated with significant consequences for health, quality of life, social

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and occupational functions, economics, and public safety (Kyle et al., 2010; Metlaine et al., 2005; Pandi-Perumal et al., 2006; Rosekind et al., 2010). In addition, treatment of insomnia utilizing both pharmacological and non-pharmacological interventions can improve the quality of life for individuals (Kyle et al., 2010).

The multi-dimensional nature of insomnia has led to the development of diverse pharmacological and psychological treatment options. Medication is now more readily available and is used more frequently (Drake et al., 2003). However, cognitive behavioral therapies (CBT) have better long-term outcomes (Morin, 2012). Insomnia often occurs co-morbid with other disorders, primarily depression and anxiety, which may lead to complications with diagnosis and treatment (Tsai et al., 2013). Moreover, insomnia increases work absenteeism and decreases concentration during work and work accident (Léger et al., 2002; Metlaine et al., 2005). Insomnia has been associated with more uses of medications, more medical problems, high seeking of medical treatment, and more depression symptoms (Cukrowicz et al., 2006; Léger et al., 2002).

The prevalence of insomnia varies across different groups and may be influenced by traumatic life events and environmental stress (Basishvili et al., 2012; Dewa et al., 2015). Very few studies have examined insomnia and its associated factors among people who have become displaced from their own environment. One of these studies was published by Basishvili et al. (2012), who examined the prevalence of insomnia and associated factors in Abkhaz refugees in Tbilisi, Georgia. They reported a high prevalence of insomnia among this particular group (41.4%). Some of the sociodemographic factors associated with chronic insomnia are higher age, female gender, lower educational status, non-single marital status, and unemployed (Allaert and Urbinelli, 2004; Ohayon, 1997; Roth et al., 2006; Xiang et al., 2008). There is also ample evidence of cultural variations in the prevalence, presentation of symptoms, and the effects of insomnia (Gureje et al., 2007; Ohayon and Partinen, 2002). However, searching different databases, no studies were found that had investigated the prevalence of chronic insomnia and associated sociodemographic factors among refugees in Jordan.

The refugees of Syrian and Iraqi nationality had entered Jordan seeking a safe and secure place to live far from the areas of conflict. Refugees in Jordan are living in camps and private home that are supported by different national and international organizations. Some of refugees were living in private homes and supported financially by a non-profit non-governmental organization. As a result of the Iraqi and Syrian conflicts, unprecedented thousands of refugees have entered Jordan. Dealing with such high numbers of refugees has placed enormous pressure on the Jordanian Government and the international community to ensure adequate access to health services and to provide proper medical care. With the resultant strain on government resources, the medical care was provided by prioritizing urgent care needs, focusing on emergencies and the management of communicable diseases. However, nothing is known about the insomnia and associated factors among refugees in Jordan.

Although insomnia has been widely studied and reported in the general population, conditions such as sleep disturbances among refugees in Jordan whom had been displaced forcefully have received little attention (Gammouh et al., 2015). However, these studies were different in design, sample, setting, and the variables being measured from this study. In addition, as far as this author is aware, this is the first study to be conducted in Jordan which examined the prevalence and the predictors of insomnia among the refugees who are now living in Jordan. This study investigated the prevalence of insomnia and the correlation with sociodemographic and clinical factors among the Syrian and Iraqi refugees living in Jordan. The study aimed to answer the following two questions:

1. What is the prevalence of insomnia among the Syrian and Iraqi refugees living in Jordan?
2. What are the predictors of insomnia among the Syrian and Iraqi refugees living in Jordan?

Methods

Design

A cross-sectional survey method was used to assess the prevalence and the predictors of insomnia among the Syrian and Iraqi refugees living in Jordan.

Sample and sampling method

A convenient sampling method was used to recruit the participants in this study. A sample of refugees was recruited from three different cities: Amman, Zarqa, and Mafraq. Participants were approached by the primary researcher in the health care centers during their routine regular health check-up. Eligibility criteria were aged 18 years or older, lived in Jordan as a refugee for at least 3 months, provided the consent to participate, and able to read and write in Arabic.

The sample size was calculated based on 95 percent confidence level, 5 percent confidence interval, and the estimated total number of refugees of about 1 million. Based on this, a minimum of 373 participants were required. In total, 450 refugees were screened; 410 met the eligibility criteria. Out of this group, 21 refused to participate, and 16 did not complete the study. As a result, 373 refugees were included in the final analysis.

Instrumentation

The demographic sheet was used to collect information regarding age, gender, education, employment, nationality, and marital status. Also, clinical details sheet includes information about medication availability, chronic illness, and smoking. The Arabic translation of the insomnia severity index (ISI), developed by Morin (1993), was used to assess insomnia status among refugees. The ISI includes seven questions with five options ranging from 0 to 4; a higher score indicates worse sleeping disturbances. The total possible score ranges from 0 to 28. The ISI has four categories: 0–7 indicates no clinical insomnia, 8–14 indicates sub-threshold insomnia, 15–21 indicates moderate insomnia, and 22–28 indicates severe insomnia. Previous research has demonstrated adequate validity and reliability of the Arabic version of the ISI scale, with Cronbach’s alpha of 0.84 (Bastien et al., 2001; Suleiman and Yates, 2011). The reliability of the ISI in this study was adequate with Cronbach’s alpha of 0.89.

Data collection procedure

Ethical approval was obtained from one University in Jordan. Subsequently, study participants were recruited during their visit to one of the health centers. The primary researcher contacted the participants to assess their eligibility, explain the research objectives and methods and provide them with a copy of the informed consent form. Once consent had been received, the participants were given the insomnia questionnaire and demographical data sheet. The completed questionnaire was returned back to the researcher in the same day the questionnaire was given to each participant.

Ethical considerations

Ethical approval had already been in Jordan before the initial stage of the study. An information sheet includes details of the study purpose and methods along with a consent form had been provided for each participant. A code number was assigned to each participant to preserve participant’s confidentiality. Participants were also informed that their participation in the study was voluntary and that they had the right to withdraw from the study at any time.

Statistical analysis

SPSS statistical package version 21 was used to analyze the data. Descriptive statistics were
used to analyze frequency, mean (M), and standard deviation (SD). Logistic regression was used to examine the predictors to insomnia based on refugees’ sociodemographical characteristics. The significant level was lower than 0.05 in the statistical tests.

### Results

#### Demographic and clinical details

The mean age of participants was 42.73 (SD=14.26) years. As shown in Table 1, the majority of the refugees settled in Amman (n=154, 41.3%), are predominantly female (n=233, 62.5%); married (n=349, 93.6%), had primary school education (n=238, 63.8%), unemployed (n=319, 85.5%), non-smokers (n=238, 63.8%), had no chronic illnesses (n=246, 66%), had access to medication when required (n=302, 81%), and were Syrian nationals (n=295, 79.1%).

#### Prevalence of insomnia among refugees

The mean ISI score was 13.71, with SD of 5.55. The majority of the participants had moderate to severe insomnia (n=196, 52.2%), and 177 (47.8%) had sub-threshold insomnia or less.

Descriptive analysis was used to describe insomnia based on the sociodemographical details. As indicated in Table 1, refugees who had moderate to severe insomnia were higher among those living in Amman and Mafraq compared to those living in Zarqa, females, unmarried, had lower educational level, unemployed, smoker, diagnosed with at least one chronic illness, and Syrian nationals.
Factors associated with insomnia

Logistic regression was used to identify the predictors to insomnia based on participants’ age, place of residence, gender, marital status, education level, employment status, nationality, smoker/non-smoker, chronic illness, and access to medication. Insomnia as outcome variable was categorized into two categories: moderate to severe insomnia and sub-threshold insomnia or less. The logistic regression model was statistically significant $X^2 (12) = 155.78$ and $p = 0.001$. The model explained 44.9 percent (Nagelkerke $R^2$) of the variance in insomnia and correctly classified 52.5 of cases. Table 2 shows that increasing age is associated with an increased probability of insomnia. Refugees living in Zarqa are 0.01 times less likely to have insomnia than refugees living in Mafraq, refugees living in Amman were 0.15 times less likely to have insomnia than refugees living in Mafraq, refugees with secondary school education and below were 2.06 times more likely to have insomnia than those with a level of education beyond secondary school, unemployed were 2.65 times more likely to have insomnia than those with steady jobs, and those who do not have access to medication were 4.29 times more likely to have insomnia than those who do have access to medication. However, gender, marital status, nationality, smoking status, and chronic illness did not significantly predict insomnia among refugees.

Discussion

To our knowledge, this study is the first to investigate the prevalence of insomnia and associated sociodemographic and clinical factors among Syrian and Iraqi refugees in Jordan. According to the ISI scores, almost half of the refugees surveyed experienced moderate to severe insomnia. It has already been established in a number of previous studies that people subjected to trauma, such as survivors of conflict situations, suffer from sleep disturbances (Cernovsky, 1990; Germain et al., 2008). The prevalence of insomnia ranged from 5 to 30 percent (Pigeon, 2010).

Studies investigated that insomnia among refugees is very limited. In one pilot study, insomnia was reported in 38 percent of North Korean refugees displaced to South Korea (Lee et al., 2016). Another study of Abkhazian refugees showed that 38 percent of refugees had insomnia (Basishvili et al., 2012). The higher scores for insomnia in our study may be

**Table 2. Logistic regression predicts likelihood of insomnia.**

<table>
<thead>
<tr>
<th>Variables</th>
<th>$B$</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp($B$)</th>
<th>Lower 95% CI</th>
<th>Upper 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.026</td>
<td>6.474</td>
<td>1</td>
<td>0.011</td>
<td>1.027</td>
<td>1.006</td>
<td>1.048</td>
</tr>
<tr>
<td>City</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zarqa city</td>
<td>−4.514</td>
<td>70.893</td>
<td>1</td>
<td>0.000</td>
<td>0.011</td>
<td>0.004</td>
<td>0.031</td>
</tr>
<tr>
<td>Mafraq city</td>
<td>1.859</td>
<td>15.072</td>
<td>1</td>
<td>0.000</td>
<td>0.156</td>
<td>0.061</td>
<td>0.398</td>
</tr>
<tr>
<td>Gender</td>
<td>0.161</td>
<td>0.325</td>
<td>1</td>
<td>0.568</td>
<td>1.175</td>
<td>0.676</td>
<td>2.043</td>
</tr>
<tr>
<td>Marital status</td>
<td>−0.248</td>
<td>0.212</td>
<td>1</td>
<td>0.645</td>
<td>0.780</td>
<td>0.271</td>
<td>2.244</td>
</tr>
<tr>
<td>Educational level</td>
<td>0.726</td>
<td>6.145</td>
<td>1</td>
<td>0.013</td>
<td>2.068</td>
<td>1.164</td>
<td>3.672</td>
</tr>
<tr>
<td>Employment</td>
<td>0.976</td>
<td>6.798</td>
<td>1</td>
<td>0.009</td>
<td>2.654</td>
<td>1.274</td>
<td>5.527</td>
</tr>
<tr>
<td>Nationality</td>
<td>−0.008</td>
<td>0.000</td>
<td>1</td>
<td>0.983</td>
<td>0.992</td>
<td>0.495</td>
<td>1.991</td>
</tr>
<tr>
<td>Smoking status</td>
<td>0.224</td>
<td>0.633</td>
<td>1</td>
<td>0.426</td>
<td>1.251</td>
<td>0.721</td>
<td>2.169</td>
</tr>
<tr>
<td>Chronic illness</td>
<td>0.020</td>
<td>0.005</td>
<td>1</td>
<td>0.943</td>
<td>1.020</td>
<td>0.590</td>
<td>1.763</td>
</tr>
<tr>
<td>Availability of medications</td>
<td>1.457</td>
<td>11.733</td>
<td>1</td>
<td>0.001</td>
<td>4.293</td>
<td>1.865</td>
<td>9.881</td>
</tr>
<tr>
<td>Constant</td>
<td>−0.043</td>
<td>0.002</td>
<td>1</td>
<td>0.961</td>
<td>0.958</td>
<td>1.006</td>
<td>1.048</td>
</tr>
</tbody>
</table>

*B*: unstandardized coefficient; *df*: degree of freedom; *p*: significant value (less than 0.05); *CI*: confidence interval.
attributed to the poor living conditions of the refugees (Veldi et al., 2005).

In addition, the results of this study indicated that older age, living in Mafrak, lower level of education, unemployment, and lack of access to medication are all factors associated with higher insomnia. The result of this study was consistent with the results of other studies that higher insomnia was associated with older age (Livingston et al., 1993; Roberts et al., 2000). A possible explanation for higher insomnia among older age refugees may be due to the presence of psychological and environmental factors that represent a daily challenge for elderly refugees (Billiard and Bentley, 2004; Gammouh et al., 2015).

The lower educational level among refugees in this study was associated with higher insomnia. This result is consistent with the previous literature (Overland et al., 2008; Sivertsen et al., 2009). This result could be due to the point that refugees with lower educational level may have poor coping strategies that may negatively impact their sleep pattern (Al-Smadi et al., 2016b).

In our study, residents of Mafrak were more likely to have insomnia. This could be explained by the proximity of the city to the Syrian border and the more acute nature of the Syrian conflict. Mafrak has also become a preferred destination for Syrian communities, thus putting pressure on the city’s resources: water, energy, housing, education, and health care. Such a situation is likely to have a negative impact on healthy sleep. Insomnia is documented as being more severe in places of overcrowding, with fewer resources and of a lower socioeconomic status (Gellis et al., 2005; Paine et al., 2004).

This study has revealed that a lack of the required medication is associated with insomnia. Although the underlying mechanisms correlating insomnia with physical health are unclear, poor health, chronic pain, and hormonal disturbances may all contribute to sleep disturbances (Gartland et al., 2014). Refugees living in Jordan experience high rates of physical illnesses (Gammoh, 2016). A lack of medication can lead to deterioration in health and consequently to sleep disturbances (Gammouh et al., 2015).

Moreover, the factors shown to be associated with insomnia, including older age, lower level of education, unemployment, and lack of access to medication, may associate with psychological problems that refugees may face and possibly affect insomnia. Previous studies indicated that older age, lower educational level, being unemployed, and lack of medication are associated with psychological problem including depression and post-traumatic stress disorder (PTSD) among refugees (Al-Smadi et al., 2016a; Bjelland et al., 2008; Gammouh et al., 2015; Neckelmann et al., 2007). However, the association between age, education level, employment status, lack of medication, and psychological problems was not studied in this study. This provides a further direction for future studies among refugees.

**Conclusion**

The majority of refugees screened in this study suffer from insomnia. Almost half of the refugees surveyed experienced moderate to severe insomnia. Some of the risk factors are modifiable, such as unemployment and lack of access to medication that should be taken into consideration when assessing and managing the clinical problem of insomnia among refugees. More attention by health care providers including nurses should be given to older refugees and those with a lower level of education, as these groups tend to be more liable to suffer from insomnia. Preventing the onset of insomnia is an indispensable approach that involves better education, resolving financial insecurities, and improving the quality of life of refugees. Both behavioral and pharmacological remedies have validity in alleviating the symptoms of sleep disturbance and are effective in preventing many of the negative consequences associated with insomnia. Health care providers including nurses, physicians, and pharmacists have a significant primary role in screening, prevention, and education about insomnia among refugees.
Limitations

There are some limitations in this study. Physical symptoms associated with insomnia, such as pain and dyspnea, were not studied. Also, insomniac refugees had concomitant illnesses, such as PTSD, depression, and anxiety (Lee et al., 2016), that were also not included in this study.

Other limitations include lack of objective sleep measurement, no data relating to sleeping habits/patterns pre-displacement, insufficient data about medication being taken currently that could affect sleep, and the diverse nature of the nationalities involved (i.e. the number of Syrians exceeded that of Iraqis). Although this study includes participants who were being as refugees for 3 months or more, the exact duration of living in Jordan as refugees was not measured. The duration of being refugees may affect their sleeping patterns. Therefore, authors recommend further research studies to assess the impact of duration on sleeping patterns. In addition, the authors suggest the implementation of a systematic insomnia screening program as soon as practically possible, as well as multi-disciplinary intervention to minimize the detrimental effects of insomnia on refugees’ health and quality of life (Unbehaun et al., 2010). Although this study includes participants who were being as refugees for 3 months or more, the exact duration of living in Jordan as refugees was not measured. The duration of being refugees may affect their sleeping patterns. Therefore, authors recommend further research studies to assess the impact of duration on sleeping patterns. In addition, the authors suggest the implementation of a systematic insomnia screening program as soon as practically possible, as well as multi-disciplinary intervention to minimize the detrimental effects of insomnia on refugees’ health and quality of life (Unbehaun et al., 2010). Although this study includes participants who were being as refugees for 3 months or more, the exact duration of living in Jordan as refugees was not measured. The duration of being refugees may affect their sleeping patterns. Therefore, authors recommend further research studies to assess the impact of duration on sleeping patterns. In addition, the authors suggest the implementation of a systematic insomnia screening program as soon as practically possible, as well as multi-disciplinary intervention to minimize the detrimental effects of insomnia on refugees’ health and quality of life (Unbehaun et al., 2010). However, the results of this study should be treated with caution due to the use of a sample that may have been insuffi ciently representative to all refugees in Jordan and limit the study to the north and middle geographical areas of Jordan. This may affect the generalizability of the findings. Therefore, it is recommended that the study be repeated using a larger and more heterogeneous sample, which includes all locations in Jordan.

Declaration of Conflicting Interests

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References


Drake CL, Roehrs T and Roth T (2003) Insomnia causes, consequences, and therapeutics: An...


