# Validation of the Malay version of the Persian adaptation of the Mannheim Dream Questionnaire (MADRE) among the Malaysian population

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*Summary*. Dreams are a common phenomenon people experience throughout their lives. So far, no validated questionnaire has been available to assess the Malaysian population's dream experiences. One of the tools available to measure dream experience and attitude towards the dream is the Mannheim Dream Questionnaire (MADRE). Therefore, there is a need to validate the Malay version of simplified MADRE based on the Persian version to explore dream experiences among the local population and their associated factors. This study aims to validate the Malay version of MADRE (M-MADRE), which was adapted from the Persian Adaptation of Mannheim Dream Questionnaire. A cross-sectional study involving 412 participants from 18 years and above was conducted via an online questionnaire form from August 2020 until October 2020. M-MADRE was initially translated from the English-translated Persian Version of MADRE into the Malay Language using forward and backward translation procedures by a group of experts. The study started by quantifying content validity using Content Validation Index to ensure M-MADRE consists of content validity and is culturally appropriate for Malaysians. The finalized version of M-MADRE was pre-tested and coordinated on 31 participants. Study participants were instructed to complete the socio-demographic questionnaire and M-MADRE questionnaire. The final step was to analyze the data using SPSS version 26 and RStudio software for construct validity by performing exploratory factor analysis, confirmatory factor analysis, construct reliability, and test-retest reliability. In this study, the final model of M-MADRE mostly fits the data, which comprises 3 factors with 21 items, compared to the Persian Version of MADRE with 24 items and 6 factors. The findings revealed acceptable fit indices (RMSEA=0.062, CFI=0.936, TLI=0.927, SRMR=0.054), overall Cronbach's alpha is acceptable (0.86-0.93), and exhibit excellent test-retest reliability (ICC = 0.95). The study revealed that a 3-factor model with 21 items of the Malay Version Version of MADRE contains good psychometric properties. With this, the scale is proven valid and reliable in measuring the dream experiences Malaysians undergo and their attitude towards it.

*Keywords:* Factor Analysis, Dream, MADRE Questionnaire, Malaysian adaptation, Malaysia

## 1. Introduction

Dreams are a common phenomenon experienced by the general population. There are several figures about the prevalence of dream components, especially for nightmares and lucid dreams. Several studies on the frequency of lucid dreams show that 57% of 840 German athletes and 75% of 295 undergraduate students experienced lucid dreams at least once in their lifetime (Albert et al., 2014; Erlacher et al., 2012). Additionally, about 1.3 to 3.9% of children will have experienced in having nightmares. The majority of nightmares will then continue to increase throughout their adolescence age and even during their adulthood. This can be seen where 6% of the population experiences nightmares at least on a monthly basis, with 1-2% of it experiencing constant or continuing nightmares (American Psychiatric Association, 2013). According to the study by Schredl et al., men were reported to have a higher frequency of creative dreams. On the other hand, women tend to have frequent nightmares while being prone to be distressed by it (Schredl et al., 2014; Schredl & Reinhard, 2011).

The human body requires sleep to allow the body and mind to recharge, and while we are asleep, dreams play a significant role in the situation. Few studies have proven that dreams influence our wakefulness in several ways, such as causing distress or providing creative ideas or scenarios. Furthermore, dreams, specifically nightmares, can also affect or predict the outcome of psychiatric condi-

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tions. It is apparent in psychotic disorders that nightmares may serve as an early sign of psychotic decompensation and are often associated with the risk of suicidal attempts among schizophrenia patients (Levin, 1998; Shirley Xin Li et al., 2014). The cohort study by Thompson et al. showed a significant association between nightmares at the age of 12 and psychotic experiences at 18 (OR=1.62) (Thompson et al., 2015). In patients with depression, nightmares are often linked with severe symptoms and higher suicidal risks (Shirley X. Li et al., 2012; Marinova et al., 2014; R. Nadorff et al., 2013; Sjöström et al., 2009). Patients with Borderline Personality Disorder (BPD) suffer a greater rate of nightmares, dream anxiety, and disturbed sleep quality, and childhood nightmares may increase the risks of BPD symptoms in early adolescence (Lereya et al., 2017; Semiz et al., 2008). A cross-sectional study done in Mannheim, Germany, found that 4.62% of adults with Attention Deficit and Hyperactivity Disorder (ADHD) had frequent nightmares (once a week) compared to 1.77% of the controls (Schredl et al., 2016).

Moreover, lucid dreams have been studied to investigate their effectiveness in treating nightmares and improving creativity along with wakefulness performance. Unfortunately, no conclusive results were able to prove the effectiveness of the method. A systematic review by de Macedo showed the possibility of using lucid dreams as a potential aid in treating patients with nightmares; however, there is limited literature, and they could not promise consistent results (de Macêdo et al., 2019). Although there are studies that showed lucid dreams might improve creativity and enhance sports performance, such as studies done by Erlacher et al. and Stumbrys and Daunyt, there are also studies that concluded otherwise, such as a study done by Albert et al. (Albert et al., 2014; Erlacher et al., 2012; Stumbrys & Daunyt, 2018).

There have been multiple reports of essential decisions, theories, inventions, and arts, which claimed to be inspired by dreams. In certain cultures, shamans use dreams in the healing process, guiding hunting parties or predicting imminent dangers to their communities (Stewart, 1947). Few of the ideas and inventions have their origins in creative dreams, such as 'Yesterday' by the Beatles, the sewing machine by Elias Howe, Benzene rings by Friedrich August Kekulé von Stradonitz, 'Frankenstein' by Mary Shelly, 'It' by Stephen King, and 'The Strange Case of Dr. Jekyll and Mr. Hyde' by Robert Louis Stevenson (Forrer, 2014; Klepel et al., 2019).

There has been little research regarding dream experiences in Malaysia. Nearly all existing research is limited to a qualitative study done about dream experiences in Malaysia, such as dreams regarding the Prophet, religious conversion, and themes of dreams among cancer patients (Abdullah et al., 2019; Ahmadi & Hussin, 2020; Sahad et al., 2018). Dreams and nightmares are common among psychiatric patients, but no local data provides the significance and severity among general populations and psychiatric patients.

There are limited tools, especially validated Malay version questionnaires, to objectively assess dreams and their effect on daily life, therefore necessitating the effort to validate the Malay version of the Mannheim Dream Questionnaire. A reliable and validated Malay version of an objective dream assessment can facilitate patients' verbalization of their dreams, thus enabling exploration into the nature of the dreams, which patients rarely discuss spontaneously.

### Mannheim Dream Questionnaire (MADRE)

Mannheim Dream Questionnaire was first developed by Schredl, Berres, Klingauf, and Schellhaas, in 2014. This original scale consists of a 28-item (21 questions, which the questions relate to 'Attitude towards dreams' are further subdivided into 8 questions), which are to elicit dream experience including dream recall, nightmares, lucid dreaming, attitude towards dreams, and effects of dreams on waking life (Schredl, Berres, Klingauf, Schellhaas, et al., 2014).

The original MADRE showed high retest reliability for all items with values between r = 0.717 and r = 0.842 (Schredl, Berres, Klingauf, Schellhaas, et al., 2014). It has been translated into French, Italian, and Persian language. The French Version of MADRE showed good test-retest reliability (r = 0.70 to 0.80), while the Italian version showed comparable findings with the original questionnaire (Ghorayeb et al., 2019, Settineri et al., 2019). Shahabian et al. translated the questionnaire to the Persian language and simplified it into 25 items questionnaire (Shahabian et al., 2017). Shahabian et al. also changed the rating scale to a 5-point Likert scale, and they deleted several items such as the percentage of recurrent nightmares, topics of the childhood nightmare, frequency of telling the dreams to others, and the impression that dreams give impulses to waking life. The Persian Version of MADRE has a good content validity ratio (CVR) and content validity index (CVI). Additionally, it has also shown good internal consistency for all items with Cronbach's alpha r = 0.75 (Shahabian et al., 2017). With further factor analysis being done, the questionnaire was finalized and simplified to a 24-item questionnaire which falls under 6 domains; 1) the effects of dreams on waking life, 2) timing, 3) experience and feelings, 4) childhood memories, 6) articles and entries available (Shahabian et al., 2018).

In the finalized Persian version of the Mannheim Dream Questionnaire, participants rated the extent to which they are endorsed with each item on a 5-point Likert scale from (1) Very low to (5) Very much. The finalized Persian version of MADRE showed excellent internal consistencies (Cronbach's α=0.85, the factor loading of the 24 items ranged between 0.42 and 0.82, and the test-retest reliability of the questionnaire was calculated at 69% (Shahabian et al., 2018). Based on statistical analysis, the study indicates that the Persian version of the MADRE questionnaire is a valid and reliable instrument.

This scale is the only tool that measures the commonly researched components of dreams: nightmares, lucid dreams, and creative dreams. Upon being translated into all sorts of languages, the tool has been of satisfaction and appreciation for scholars worldwide. Some different languages consist of published translations in French, Italian, and Persian versions (Ghorayeb et al., 2019; Scapin et al., 2018; Shahabian et al., 2017, 2018). This scale has been used to measure the frequency of nightmares in ADHD patients, lucid dreaming and creativity, and the association between creative dreams and personality traits (Klepel et al., 2019; Schredl et al., 2016; Stumbrys & Daunyt, 2018).

## 2. Method

### 2.1. Design and participation

The study protocol was approved by the Institutional Review Board of the university. This cross-sectional study was conducted through the internet and social media via an on-

line survey form. Before the data collection process took place, the objectives and importance of the questionnaires and the voluntary basis of participation were informed and made aware to all subjects. A total of 412 (151 for EFA and 216 for CFA) participants filled out the form. All participants recruited through the convenience and snowball sampling method were 18 years old and above, fluent in the Malay language, mentally stable, and never received psychiatric treatment. For CFA, additional exclusion criteria were those already participating in the EFA. Participants were then randomly selected from those who consented to be contacted again and left their contact details, either email or phone number. A reminder to repeat the questionnaire and links to the questionnaire were sent the contact details to the participants 14 days from their first attempt. A total of 40 participants repeated the questionnaire as instructed and were given a token of appreciation for their participation.

## 2.2. Materials

### *2.2.1 Socio-demographic questionnaire*

This section includes socio-demographic characteristics of interest: age, gender, ethnicity, education status, employment status, and mental health status. Contact details such as phone numbers and email are optional for those who agreed to retake the questionnaire.

### *2.2.2 Malay version of the Mannheim Dream Questionnaire (MADRE)*

MADRE was first developed by Schredl et al. in 2014, consisting of 21 items that elicit dream history, including dream recall, nightmares, lucid dreaming, attitude towards dreams, and the effects of dreams on waking life (Schredl et al., 2014). Questions regarding attitude towards dreams were further subdivided into 8 questions. It has been translated into many languages, some being in French, Italian and Persian. We have adopted items and construct from the English-translated Persian version, which was simplified from the English-translated original version of the MADRE questionnaire as it was simpler and easier to administer (Shahabian et al., 2017, 2018). The Persian version of MADRE has 24 questions that assess the effects of dreams on waking life, timing, experience, feelings, childhood memories, and articles and entries available (Shahabian et al., 2018). The questionnaire is self-rated and is measured on a Likert scale from 1 to 5, whereby a rating of 1 signifies 'Very Low' and 5 'Very Much.' A validation study conducted in 2018 reported good internal consistency of the MADRE questionnaire with Cronbach's alpha of 0.85 and good test-retest reliability of 69% (Shahabian et al., 2018).

## 2.3. Instrument validation

The Malay version of the Mannheim Dream Questionnaire was translated from the English-translated Persian Version of MADRE using these steps (Beaton et al., 2000):

1) Two bilingual experts, a psychiatrist and a linguist from the language centre forward-translated the English version into the Malay version. These forward translations were reconciled into one consensus translation before being back-translated.
2) Another two bilingual experts, a psychiatrist and a linguist who had not seen the original English version, back-translated the Malay version into the English version
3) A psychiatrist and another linguist who were competent in Malay and English then reviewed both Malay translation from the English version and English back-translation from Malay
4) The final version of the Malay version of MADRE was sent to 4 experts (Yusoff, 2019): 2 clinical psychologists, a consultant psychiatrist, and a psychometric expert for content validity and to ensure satisfactory face, semantic, and criterion validity (Yusoff, 2019). The I-CVI for all items ranged from 0.75 to 1. Only one item, Q2 scored 0.75, while the other items had a score of 1. Overall, S-CVI is 0.99, and S-CVI/UA of 0.096. Thus, the scale of our questionnaire has achieved a satisfactory level of content validity. The pre-final version of M-MADRE was then produced with all 24 items.
5) The pre-final version was then pre-tested among 31 respondents to ensure clarity and easy understanding of its intended population. Based on the feedback, several amendments were made to the structure of the words and the choice of answers in Questions 3 and 10. The original English version and the translated Malay version are presented in Appendix.

## 2.4. Statistical Analysis

The Statistical Package for Social Science (SPSS) version 26.0 software was used to analyze the participants' socio-demographic data for descriptive statistics, Exploratory Factor Analysis (EFA), Cronbach's alpha, and test-retest reliability. The R-studio software was used to analyze the EFA-derived model using Confirmatory Factor Analysis.

### *2.4.1 Exploratory Factor Analysis (EFA) and internal consistency reliability*

A total of 151 participants enrolled in the initial EFA study. Principal axis factoring with Promax rotation was performed on the 24 completed items to extract the major contributing factors. Items with factor loading less than 0.3 were considered for removal, while the number of factors with an eigenvalue of more than one was further examined (Hair et al., 2010). After the deletion of items was done, the factor loading was re-examined, and the EFA model was subsequently re-specified. For reliability, the cut-off value of > 0.6 was taken for Cronbach's alpha coefficient to be accepted for each construct's internal consistency (Hair et al., 2010).

### *2.4.2 Confirmatory Factor Analysis (CFA) and construct reliability*

A total of 261 samples were used for CFA analysis. The analysis was conducted using RStudio. Problematic items with factor loading less than 0.50 are identified and removed from the CFA model after the researchers carried out adequate theoretical support. Standardized residuals were inspected for items that may cause a poor fit CFA model. The modification index (MI) was examined, and items' residual correlation within the same factor was added if necessary. Several fit indices as recommended by Hair, Black, Babin, and were used to assess the fitness of the models: Root Mean Square Error of Approximation (RMSEA) with an acceptable level of

less than 0.07, Standardized Root Mean Square Residual (SRMR) with an acceptable level of less than 0.08, Tucker–Lewis Fit Index (TLI) and Comparative Fit Index (CFI) with an acceptable level of more than 0.92 (Hair et al., 2010). The construct reliability (CR) of the CFA measurement model for the M-MADRE scale was calculated using Raykov's method (Raykov & Marcoulides, 2016). A recommended value for CR is at least 0.70 or higher. Cronbach's alpha was also reported for each factor in the CFA model. The discriminant validity of factors was determined based on the final CFA model. Correlation between the factors less than 0.85 indicates the discriminant validity is achieved (Kline, 2011).

#### *2.4.3 Test-retest reliability*

Test-retest reliability analysis was conducted to examine the stability of the M-MADRE by using SPSS 26. The intraclass correlation (ICC) value was reported. ICC values greater than 0.90 were considered excellent stability (Koo & Li, 2016).

## 3. Results

### 3.1. Characteristics of participants

For EFA, there were 151 participants with a mean age of 30.78 years old (SD = 11.66, ranging from 18 to 62) and 261 participants in CFA with a mean age of 30.78 years old (SD = 11.12, ranging from 18 to 62), with the female as the majority for both EFA (70.9%) and CFA (63.2%). The participants are predominantly Malays for both EFA (92.1%) and CFA (92.3%). The majority of the participants for both EFA and CFA received tertiary education and worked full time.

*Table 1*. Characteristics of participants in EFA and CFA

| | EFA | | CFA | |
|---|---|---|---|---|
| | Freq. (%) | Mean (SD) | Freq. (%) | Mean (SD) |
| **Age** | | 30.78 (11.66) | | 30.75 (11.12) |
| **Sex** | | | | |
| Male | 44 (29.1) | | 96 (36.8) | |
| Female | 107 (70.9) | | 165 (63.2) | |
| **Marital Status** | | | | |
| Single | 80 (53.0) | | 153 (58.6) | |
| Married | 68 (45.0) | | 105 (40.2) | |
| Divorced | 3 (2.0) | | 3 (1.1) | |
| **Ethnicity** | | | | |
| Malay | 139 (92.1) | | 241 (92.3) | |
| Chinese | 6 (4.0) | | 12 (4.6) | |
| Indian | 4 (2.6) | | 5 (1.9) | |
| Others | 2 (1.3) | | 3 (1.1) | |
| **Education status** | | | | |
| No formal education | 2 (1.3) | | 1 (0.4) | |
| Primary school | 1 (0.7) | | 0 (0) | |
| Secondary school | 8 (5.3) | | 11 (4.2) | |
| Diploma/certificate | 56 (37.1) | | 58 (22.2) | |
| Degree | 65 (43.0) | | 151 (57.9) | |
| Masters | 15 (9.9) | | 36 (13.8) | |
| PhD | 4 (2.6) | | 4 (1.5) | |
| **Employment status** | | | | |
| Full time | 77 (51.0) | | 151 (57.9) | |
| Part time | 3 (2.0) | | 7 (2.7) | |
| Retired | 4 (2.6) | | 10 (3.8) | |
| Student | 49 (32.5) | | 75 (28.7) | |
| Housewife | 7 (4.6) | | 1 (0.4) | |
| Unemployed | 11 (7.3) | | 17 (6.5) | |

*Table 2*. Summary for Factor loading and Cronbach alpha.

| Construct/items | Cronbach alpha | Factor loading |
|---|---|---|
| General characteristic of dreams and nightmares | 0.92 | |
| Q1 | | 0.58 |
| Q2 | | 0.63 |
| Q4 | | 0.93 |
| Q5 | | 0.75 |
| Q6 | | 0.86 |
| Q7 | | 0.84 |
| Q8 | | 0.49 |
| Q12 | | 0.74 |
| Q13 | | 0.46 |
| Q14 | | 0.51 |
| Q15 | | 0.40 |
| Attitude towards dreams | 0.89 | |
| Q19 | | 0.69 |
| Q20 | | 0.73 |
| Q21 | | 0.74 |
| Q22 | | 0.63 |
| Q23 | | 0.91 |
| Q24 | | 0.89 |
| Dreams literature and meaning search | 0.85 | |
| Q11 | | 0.48 |
| Q16 | | 0.79 |
| Q17 | | 0.87 |
| Q18 | | 0.83 |
| Lucid Dreams | 0.75 | |
| Q9 | | 0.82 |
| Q10 | | 0.97 |

### 3.2. Results of EFA and internal consistency

We performed EFA on the 24 items using Principal axis factoring with a Promax rotation technique and set acceptable factor loading of >0.3. The results show good Kaiser–Meyer–Olkin (KMO) value of 0.911 and the significant Bartlett's test of sphericity ($p < 0.001$), however only 5 factors have eigenvalues greater than 1. We continued to fix the model based on an eigenvalue greater than 1. The computed KMO and the Bartlett's test of sphericity again support our EFA model's validity (0.921; <0.001) with a total variance of 68.53%. All the items had a factor loading more than 0.3 and mostly fell into a different domain. Although there was cross-loading for item Q2 and we decided to include it in the domain with higher factor loading. The Cronbach's alpha for reliability showed acceptable values for factor 1, 2, 3, and 4. However, Cronbach's alpha for factor 5, which contains items Q3 and Q11 are 0.5, less than acceptable values set at 0.6.

We decided to remove item Q3, which assessed the emotional tone of the dream, and reran the EFA. We obtained

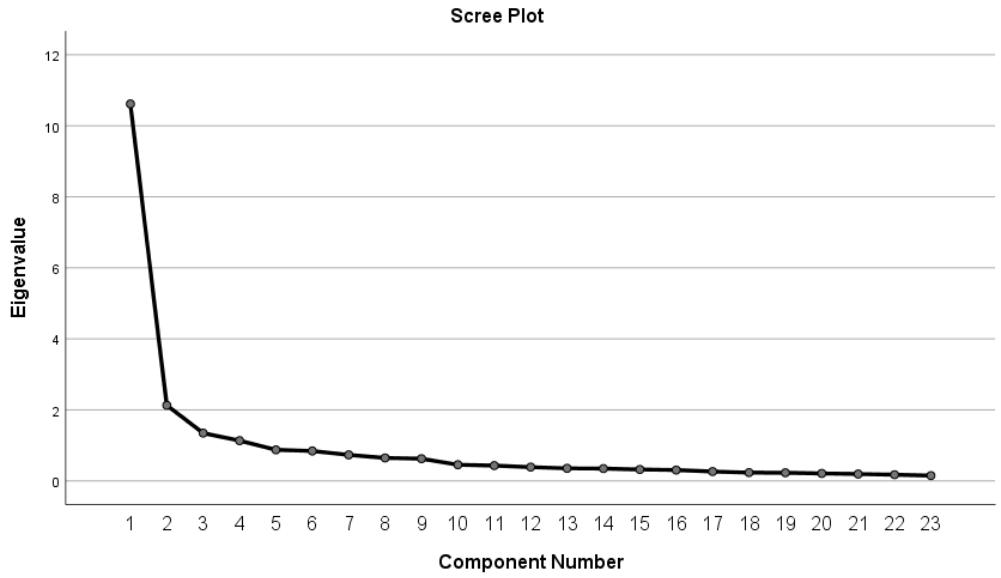


*Figure 1*. Scree Plot for M-MADRE construct.

good Kaiser–Meyer–Olkin (KMO) value of 0.925 and the significant Bartlett's test of sphericity ($p < 0.001$), however, only 4 factors have eigenvalues greater than 1 (figure 1). We then fix the model based on an eigenvalue greater than 1. The computed KMO and Bartlett's test of sphericity again support our EFA model's validity (0.925; <0.001) with a total variance of 66.18%. All the remaining items had a factor loading of more than 0.3 and fell into 4 domains. The number of items in each domain varied. The four factors are named "General characteristic of dreams and nightmares," "Attitude towards dreams," "Dream literature and meaning search," and "Lucid Dreams." The Cronbach's alpha for reliability showed acceptable values for factor 1, 2, 3, and 4, which are 0.92, 0.89, 0.85, and 0.75. The final factor loading, Cronbach alpha table, and their respective proposed factor name are stated in Table 2.

### 3.3. Results of CFA and construct reliability

CFA was used to confirm the validity of the M-MADRE found in the EFA. CFA was conducted for M-MADRE with 23 items and four factors model. The initial model (Model-1) did not fit the data well because the fit indices were not within acceptable threshold values (see Table 3, Model-1). In addition, factor-4 has one item (Q9, 1.04) with standardized factor loading more than the value of one; meanwhile, factor-1 has one item (Q14) with high residual covariance with other items. After each item was inspected, it was decided to remove Q14 from the initial model. However, after examining the content of items Q9 and Q10 (under the same factor-4) with their relation to lucid dreams, we decided not to remove them. These two items are combined with factor-1 because Q9 is a construct about lucid dreams frequency and one of the dreams' essential components.

The CFA model with three factors was tested, but the fit indices of CFI and TLI were still not within the acceptable threshold value (see Table 3, Model-2). After inspecting the items' factor loading, item Q10 has low factor loading (0.40). Item Q10 was removed from the model after discussion among the researchers. The model was improved substantially, with all fit indices achieving the recommended threshold value (see Table 3, Model-3). The correlation between factors in Model-3 was below 0.85, indicating that a CFA model's discriminant validity is achieved (see Figure 1).

Table 4 shows the standardized factor loadings and construct reliability for the re-specified Model-3. All the factor loadings exceeded the threshold value of 0.50. The CR values for all the factors in Model-3 were greater than 0.70.

### 3.4. Test-retest reliability

For test-retest reliability, 40 participants volunteered to complete the M-MADRE again on day 14. The ICC value was calculated based on CFA Model-3 with three factors and 21 items. The ICC value for overall M-MADRE was 0.96 (95%CI: 0.92, 0.98, $p<0.001$). As well as the ICC value for each factor were 0.95 (95%CI: 0.91, 0.98, $p<0.001$) for factor-1, 0.91 (95%CI: 0.83, 0.95, $p<0.001$) for factor-2, 0.87 (95%CI: 0.76, 0.93, $p<0.001$) for factor-3. As a result, the ICC values revealed that the M-MADRE had excellent stability over time.

*Table 3*. Summary for M-MADRE model fit indices (n=261).

| CFA model | RMSEA (90% CI) | SRMR | CFI | TLI | $\chi^2$ (p-value) |
|---|---|---|---|---|---|
| Model-1[a] | 0.074 (0.067, 0.082) | 0.056 | 0.900 | 0.887 | 547.808 (<0.001) |
| Model-2[b] | 0.073 (0.065, 0.082) | 0.058 | 0.904 | 0.892 | 493.532 (<0.001) |
| Model-3[c] | 0.062 (0.052, 0.071) | 0.054 | 0.936 | 0.927 | 368.268 (<0.001) |

Note: [a]CFA model with four factors and 23 items. [b]without item Q14, model with three factors and 22 items. [c]without items Q14 and Q10, model with three factors and 21 items.

*Table 4*. Standardized factor loadings, construct reliability (CR), Cronbach's alpha for Model-3.

| Construct/items | λ | Cronbach's alpha |
|---|---|---|
| Factor-1 | | 0.90 |
| Q1 | 0.65 | |
| Q2 | 0.73 | |
| Q4 | 0.65 | |
| Q5 | 0.68 | |
| Q6 | 0.74 | |
| Q7 | 0.70 | |
| Q8 | 0.53 | |
| Q12 | 0.73 | |
| Q15 | 0.59 | |
| Q9 | 0.58 | |
| Q11 | 0.60 | |
| Q13 | 0.64 | |
| Factor-2 | | 0.93 |
| Q19 | 0.85 | |
| Q20 | 0.89 | |
| Q21 | 0.82 | |
| Q22 | 0.85 | |
| Q23 | 0.78 | |
| Q24 | 0.83 | |
| Factor-3 | | 0.86 |
| Q16 | 0.79 | |
| Q17 | 0.86 | |
| Q18 | 0.81 | |

Note: λ=standardised factor loading, CR =construct reliability, all factor loadings were statistically significant at p<0.050. Factor 1: General characteristic of dreams and nightmares, Factor 2: Attitude towards dreams, Factor 3: Dreams literature and meaning search

## 4. Discussion

Although dreams are a common phenomenon experienced by people worldwide, the objective investigations of dream characteristics and attitudes towards dreams are relatively new in our population. MADRE is a self-report measuring tool for dream experiences, effects on waking life, and attitudes towards dreams. To the authors' knowledge, this is the first study that examines the factor structure of the Mannheim Dream Questionnaire (MADRE) or objective dream scale among the general population of Malaysia. Thus, validating the Malay version of MADRE is crucial in discovering patterns of dreams and their components, such as nightmares, lucid dreams, and creative dreams, among the Malaysian population and their attitude towards dreams. Although French and Italian researchers have adopted the German translation for their respective language, we decided to adopt the simplified English-translated Persian adaptation of the questionnaire as it was validated using factor analysis and easier to administer in our population setting as it has fewer items and a simplified answer.

At face value, M-MADRE appeared to be understandable and acceptable among the Malaysian population. Based on our Content Validation Index with four experts, the construct of M-MADRE is valid and adequate in assessing dream characteristics and attitudes towards the dream. It is comparable with CVI in the validation study of the Persian version of MADRE (Shahabian et al., 2017).

While the Persian version of MADRE identified 6 factors, we have identified 4 factors in EFA: general characteristics of dreams, attitude towards dreams, dream literature and search of meaning, and lucid dreams. For Q3, the emotional tone of the dream experiences was removed as the Cronbach Alpha for factor 5 as it is lower than 0.6. A possible explanation for this result is that the majority of the participants are of Malay ethnicity and come from the religion of Islam. They might feel reluctant to discuss the emotions of the dreams, especially whenever negative emotions are included. This situation might be based on the saying of the Prophet Muhammad, which discouraged someone who had nightmares from disclosing it to anyone, while good dreams should only be shared among loved ones (ibn al-Hajjaj). After the deletion of Q3, the Cronbach alpha of the remaining 23 items was improved. Researchers then proceeded with CFA, during which we removed 3 constructs as they did not fit the model. We also removed Q10, the age of the lucid dream first experience. We decided to put Q9 regarding the frequency of lucid dreams in the first factor regarding the general characteristics of dreams, as it is one of the essential characteristics that we want to study more in the future. Although there is a study regarding lucid dream practices among the Senoi tribe in 1947, which GW Domhoff later challenged, there is a lack of evidence to support or deny lucid dream practices and understanding among the Malaysian population (Domhoff, 1985; Stewart, 1947).

Furthermore, lucid dream interpretation differs based on culture. As such can be seen among westerners that lucid dreams are merely a fantasy, while Tibetan Buddhists consider it an insight, Native Americans consider them as conversations, and the Raramuri tribe of Mexico consider lucid dreams as navigation (Lohmann & Dahl, 2014). We also removed Q14, which regards identifying dreams and giving ideas in the waking life, as it does not fit the model. Our findings contradict the findings from other studies done in Malaysia, where cancer patients had dreams as a signal for them to seek treatment, and Muslim converts reportedly converted to Islam after receiving signs from their dreams (Abdullah et al., 2019; Ahmadi & Hussin, 2020).

The M-MADRE final model with 3 factors named Factor 1: General characteristics of dreams and nightmares, Factor 2: Attitude towards dreams, and Factor 3: Dreams literature and meaning search. Factor 1 measures the characteristics and frequency of dreams, nightmares, lucid dreams, and Deja Vu, while Factor 2 measures the respondents' perceptions and beliefs regarding the relationship between the dream experiences and their waking life. Factor 3: Dreams literature and meaning search, which measures the extent of their efforts to find the meaning and explanation of their experiences to understand their dreams better.

Our final Cronbach alpha for the 3-factor model ranges from 0.86-0.93, which shows that M-MADRE has excellent construct validity. This finding is comparable with the Persian Version of MADRE, which has Cronbach alpha for the whole questionnaire calculated at 0.85 (Shahabian et al., 2018). M-MADRE showed good stability. It has an overall ICC value for test-retest reliability of 0.96, with the ICC values for factors ranging from 0.87 to 0.95. This study shows that the M-MADRE is comparable compared to the other version of MADRE, such as in German (ranging from 0.585 to 0.842), French (ranging from 0.51 to 0790), and Persian (0.69).

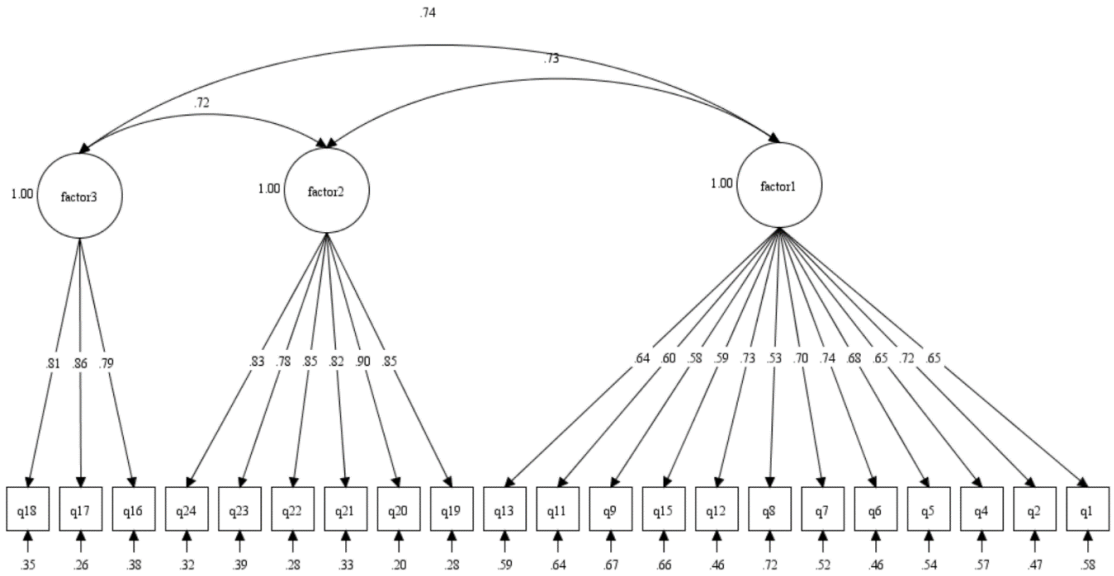


*Figure 2*. CFA diagram for Model-3.

The finalized model of M-MADRE is a valid and reliable tool for assessing dream experiences and attitudes towards dreams among the Malaysian population. Therefore, it would be a beneficial tool to propel dream research in Malaysia in the future.

## 5. Limitations and Future Research

The researchers acknowledged that our study is not without limitations. Firstly, our sample was selected via the convenience and snowball sampling method, where we encouraged our participants to distribute the link to the online questionnaire form to their contacts. Therefore, we may miss specific segments of the Malaysian community. This is evidenced by the majority of our participants for both EFA and CFA are females, of Malay ethnicity, and have tertiary education. Another limitation that we recognize is that our data collection is done online. Although Malaysia has excellent internet penetration, with 90% of the household having access to the internet, there are still digital gaps such as the disparity between the states, income levels, and gender, which may lead certain segments of the population not included in this study (Gong, 2020). We would recommend including other segments of the population in future research.

Another limitation of M-MADRE is that it is adapted from the Persian version, which is simplified from the original MADRE. Thus it is easier and quicker to administer; however, it sacrifices the details that can be measured in the original version. M-MADRE is a self-rating measure; thus, there is recall bias regarding respondents' dream experiences. In the future, we would recommend using other methods concurrently, such as a dream diary to record occurrences of dream experiences among respondents.

## 6. Conclusions

Our present study confirmed that Mannheim Dream Questionnaire has good construct validity, satisfactory reliability, and excellent stability, comparable to studies of MADRE in other languages and versions, albeit more simplified than the rest. It is our plan in the future to investigate large representative samples to obtain norms in dream experiences among the Malaysian population. Furthermore, we hope this questionnaire will be applied to several other samples; patients with sleep disorders, mental disorders, or personality disorders or in different contexts such as among individuals in artistic work or athletes by other researchers.

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# Appendix

**English Translation of Malay version of simplified Mannheim Dream Questionnaire (M-MADRE)**

Below are the statements and questions regarding your dream experience. There are no right or wrong answers. Please read the statements and choose answers that represent your dream experience.

| | | Never | Sometimes | Partly | Frequently | Always |
|---|---|---|---|---|---|---|
| *1.* | How often have you recalled your dreams recently in the past several months? | 1 | 2 | 3 | 4 | 5 |
| *2.* | How intense are your dreams emotionally? | 1 | 2 | 3 | 4 | 5 |
| *3.* | How often have you experienced nightmares recently in the past several months? | 1 | 2 | 3 | 4 | 5 |
| *4.* | If you currently experience nightmares, how distressing are they to you? | 1 | 2 | 3 | 4 | 5 |
| *5.* | How frequent of your nightmares are recurrent ones? | 1 | 2 | 3 | 4 | 5 |
| *6.* | Do you experience recurring nightmares that relate to a situation that you have experienced in your waking life? | 1 | 2 | 3 | 4 | 5 |
| *7.* | How often did you experience nightmares during your childhood (from 6 to 12 year of age)? | 1 | 2 | 3 | 4 | 5 |
| *8.* | How often do you experience so-called lucid dream? In a lucid dream, one is aware that one is dreaming during the dream. Thus, it is possible to wake up deliberately, or to influence the action of the dream actively, or to observe the course of the dream passively. | 1 | 2 | 3 | 4 | 5 |
| *9.* | How often do you record your dreams? | 1 | 2 | 3 | 4 | 5 |
| *10.* | How often do your dreams affect your mood during the day? | 1 | 2 | 3 | 4 | 5 |
| *11.* | How often do your dreams give you creative ideas? | 1 | 2 | 3 | 4 | 5 |
| *12.* | How often do you experience Déjà vus? * During a déjà vu experience one is convinced one is reliving real-life situation that was already experienced in a dream | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| *13.* | Have you ever read something on the topic of dreams? | 1 | 2 | 3 | 4 | 5 |
| *14.* | Did the literature about dreaming / dream interpretation help you to better understand your dreams? | 1 | 2 | 3 | 4 | 5 |
| *15.* | How much meaning to you attribute to your dreams? | 1 | 2 | 3 | 4 | 5 |
| *16.* | How strong is your interest in dreams? | 1 | 2 | 3 | 4 | 5 |
| *17.* | I think that dreams are meaningful. | 1 | 2 | 3 | 4 | 5 |
| *18.* | I want to know more about dreams. | 1 | 2 | 3 | 4 | 5 |
| *19.* | If somebody can recall and interpret his/her dreams, his/her life will be enriched. | 1 | 2 | 3 | 4 | 5 |
| *20.* | I think that dreaming is in general a very interesting phenomenon. | 1 | 2 | 3 | 4 | 5 |
| *21.* | A person who reflects onher/his dreams is certainly able to learn more about her/himself. | 1 | 2 | 3 | 4 | 5 |

**Soalselidik Mimpi Mannheim versi Bahasa Melayu**

Berikut adalah soalan dan pernyataan tentang pengalaman mimpi anda. Tidak ada jawapan yang betul atau salah. Sila baca setiap ayat dengan teliti, kemudian pilih jawapan yang terbaik mewakili pendapat anda

| | | Tidak sama sekali | Tidak begitu banyak | Sebahagiannya | Agak banyak | Sepenuhnya |
|---|---|---|---|---|---|---|
| *1.* | Berapa kerapkah anda teringat mimpi anda dalam beberapa bulan lepas? | 1 | 2 | 3 | 4 | 5 |
| *2.* | Sekuat manakah mimpi anda secara emosi? | 1 | 2 | 3 | 4 | 5 |
| *3.* | Berapa kerapkah anda alami mimpi buruk dalam beberapa bulan lepas? | 1 | 2 | 3 | 4 | 5 |
| *4.* | Jika anda sedang mengalami mimpi buruk, sejauh manakah ia mengganggu perasaan anda? | 1 | 2 | 3 | 4 | 5 |
| *5.* | Berapa kerapkah mimpi buruk anda berulang-ulang? | 1 | 2 | 3 | 4 | 5 |
| *6.* | Berapa kerapkah anda mengalami mimpi buruk berulang-ulang yang berkaitan dengan situasi anda alami dalam kehidupan realiti? | 1 | 2 | 3 | 4 | 5 |
| *7.* | Berapa kerapkah anda alami mimpi buruk semasa zaman kanak-kanak (dari umur 6 hingga 12 tahun)? | 1 | 2 | 3 | 4 | 5 |
| *8.* | Berapa kerapkah anda mengalami mimpi nyata (lucid dream)? Mimpi nyata – seseorang itu sedar bahawa dia sedang bermimpi. Oleh itu, dia boleh bangun dengan sengaja, atau mempengaruhi tindakan mimpi secara aktif, atau memerhatikan perjalanan mimpi secara pasif | 1 | 2 | 3 | 4 | 5 |
| *9.* | Berapa kerapkah anda mencatat mimpi anda? | 1 | 2 | 3 | 4 | 5 |
| *10.* | Berapa kerapkah mimpi anda mempengaruhi mood anda pada siang hari? | 1 | 2 | 3 | 4 | 5 |
| *11.* | Berapa kerapkah mimpi anda memberikan anda idea-idea kreatif? | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| *12.* | Berapa kerapkah anda mengalami Deja vu? *Semasa mengalami Deja vu, seseorang itu percaya yang beliau mengalami semula situasi di alam nyata seperti yang pernah dialami di dalam mimpi sebelum itu | 1 | 2 | 3 | 4 | 5 |
| *13.* | Adakah anda pernah membaca sebarang topik tentang mimpi? | 1 | 2 | 3 | 4 | 5 |
| *14.* | Adakah literatur/bahan bacaan tentang mimpi atau penafsiran mimpi membantu anda memahami mimpi anda dengan lebih baik? | 1 | 2 | 3 | 4 | 5 |
| *15.* | Sebanyak manakah tafsiran yang anda kaitkan dengan mimpi anda? | 1 | 2 | 3 | 4 | 5 |
| *16.* | Sejauh manakah anda minat terhadap mimpi? | 1 | 2 | 3 | 4 | 5 |
| *17.* | Saya rasa mimpi itu bermakna. | 1 | 2 | 3 | 4 | 5 |
| *18.* | Saya ingin tahu lebih lanjut tentang mimpi. | 1 | 2 | 3 | 4 | 5 |
| *19.* | Sekiranya seseorang itu mengingati dan menafsirkan mimpinya, hidup mereka akan lebih bermakna. | 1 | 2 | 3 | 4 | 5 |
| *20.* | Secara umumnya, saya berpendapat mimpi adalah satu fenomena yang sangat menarik. | 1 | 2 | 3 | 4 | 5 |
| *21.* | Seseorang yang melakukan muhasabah terhadap mimpi mereka pasti dapat belajar lebih banyak tentang diri sendiri. | 1 | 2 | 3 | 4 | 5 |