The International Journal of Psychosocial Rehabilitation
Volume 21, Number 1
January 2017 to December 2017

# Relationships Between Cognitive Impairment, Knowledge and Attitudes Among Drug Misusers Undergoing an Islamic Therapy in Malaysia

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**Citation:**
Lua PL, Embong NH, Mohammed AM, Makhtar M, Hassan A, Jusoh JA & Abdullah RA. (2017) Relationships Between Cognitive Impairment, Knowledge and Attitudes Among Drug Misusers Undergoing an Islamic Therapy in Maliysia. ***International Journal of Psychosocial Rehabilitation. Vol 21 (1) 75-87***

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# Abstract

Studies on the relationship between knowledge and attitude (KA) and cognitive status of drug misuders are generally still limited in Malaysia. In particular, those who are seeking religious-based modalities to treat addiction problems. This study aimed to 1) determine the cognitive status and KA among drug addicts and 2) compare the KA of drug addicts with different cognitive status (regrouped into ”Good” and ”Poor”). Drug misusers who were undergoing the Islamic (Inabah) Therapy Module were enrolled from Pusat Rawatan Darul Taubah in Pasir Puteh, Kelantan. The Malay Sahlgrenska Academy Self – Reported Cognitive Impairment Questionnaire (SASCI – Q) and Drug – Related Knowledge, Attitudes and Belief (KA) Questionnaire were administered (higher scores indicating favourable cognitive and KA status). Data was analysed using SPSS 23, employing descriptive and non-parametric techniques. Thirty – seven male Muslim participants were recruited (age = 28.4 ± 7.0 years; single = 81.1%; PMR/SRP/LCE qualification = 45.9%; self-employed = 62.2%). Both cognitive status and KA were moderate, with mean of 66.2 ± 13.3 and 57.3 ± 12.5 respectively. Those who started addiction younger had worse cognitive status. With regard to KA, no significant difference was detected between respondents possessing different cognitive status (all $p > 0.05$). Nonetheless, the general trend demonstrated that those with higher cognitive status (median $\geq 66.2$) reported relatively better knowledge (60.4 ± 16.9). More favourable knowledge and attitudes profiles were similarly exhibited by the group with higher cognitive status.


**Keywords:** Cognitive Impairment, Knowledge, Attitude, Drug Misusers, Islamic Therapy.

# Introduction:

Drug addiction is one of most serious social problems and has become the nation’s number one enemy. Addiction to illicit drugs continues to be a significant public health problem with devastating medical, social, and societal consequences (Sinha & Jastreboff, 2013). The annual number of drug misusers is currently estimated at 26,668 people in Malaysia for year 2015 and among that population, 76.1% were new cases while 23.9% were relapse cases (Agensi Anti Dadah Kebangsaan, 2015). Around 80% of that population were Malay. On average the number of new drug misusers for a month is 1,691 people, i.e. around 56 people per day. There are numerous risk factors associated with this problem. Among them are family history of addiction, having another mental disorder, peer pressure, lack of family involvement, anxiety, depression and loneliness (Seghatoleslam, Habil, Hatim, Rashid, Ardakan & Motlaq, 2015).

Drug addiction occurs as a result of overdose and misuse of drugs that deviate from the initial purpose of drugs intention and their intended use. Excessive use would also affect brain functioning especially with regard to their cognition level (Harrell et al., 2014; Vonmoos, Hulka, Preller, Minder, Baumgartner, & Quednow, 2014; Davis, Liddiard, & McMillan, 2002). A recent study reported that cognitive impairment in young users was less impaired compared to adults as the cognitive performance including executive functioning begins to decline when the individuals are in their 20’s or 30’s (Salthouse, 2009). Their level of thinking was also revealed to be significantly different as the educated class performed better in intelligence and memory but not in attention.

Kuypers et al. (2016) interestingly reported that the memory of ecstasy users did not differ from non-ecstasy users and it was within the normal range. However for those who were in heavy use impairments in both memory as well as their cognitive status were evident. The same goes to cocaine users as Vonmoos et al. (2014) revealed decreased cognitive performance, especially in their working memory. Their study also discovered that the greater the amount of cocaine use, the bigger the problem with cognitive impairment. In addition, cannabis users also claimed that increased susceptibility to false memory, for example - memory illusions even when they were drug-free (Riba et. al, 2015). Additionally opiate abusers were shown to have a greater risk of neuropsychological impairment (Davis, Liddiard, & McMillan, 2002). The task performance of drug users similarly differed significantly over four cognitive domains i.e. executive function, visual memory, attention control and response control (Ersche, Turton, Chamberlain, Muller, Bullmore, & Robbins, 2012).

Apart from cognitive status, knowledge and attitude (KA) about drug addiction are collectively considered as one the leading factors contributing to the drug addiction issue. People’s knowledge about the harmful effects of drug addiction was generally adequate yet unfortunately they had limited awareness towards the problems. Students have also been provided with a lot of information about the harmful effects of drug addiction but the need and

belief to spread the awareness is still lacking in the community (Nebhinani, Nebhinani, Misra & Grewal, 2013; Adogu, Njelita, Egenti, Ubajaka & Modebe, 2015; Bryan, Moran, Farrell, & O'Brien, 2000). In addition, attitudes and knowledge were also reported to be the main factors for the success of treatment especially community-based treatment (Matheson et al., 2014) as they were more willing to participate in the treatment, acknowledging the benefits.

Most research have consistently demonstrated that drug addicts themselves do not have a comprehensive understanding of the basic information about the drugs addiction problem ranging from potential side effects to the individual, family, society and country (Nebhinani, Nebhinani, Misra, & Grewal, 2013). The attitudes of drug addicts were reported to be negative, displaying characteristics such as social avoidance, lack of sympathy and fear (Bryan, Moran, Farrell, & O'Brien, 2000). These negative attitudes may further alienate a social group that is already socially marginalised. Although some studies have suggested that drug addicts' cognitive functioning and their knowledge, attitude and belief levels were negative, the problems of stigma remain widespread.

Thus receiving useful information regarding the problem becomes a critical issue and plays a vital role in helping health carers, educators, and the general public to understand and learn about drug addiction problems to ensure positive outcomes are targeted (Khalid, 2008). Equally lacking is research on cognitive functioning in association with KA among drug misusers institutionalised under religious – oriented programmes in Malaysia. Consequently, our study intended to evaluate the general level of cognitive impairment status, KA profiles and to compare the cognitive impairment status based on the demography of drug misusers undergoing Inabah therapy (an Islamic – based approach). The knowledge and attitude profiles were further compared in relation to cognitive status to ascertain its association.

# Methodology

## Study design and setting

This cross-sectional pilot study involved participants who were enrolled in Inabah programme at Pusat Baitul Taubah, Pasir Puteh, Kelantan, Malaysia. Inabah programme was one of the religious-based approaches built based on the Al-Quran, Hadith, Ijtihad and Tasawwuf Tarikat Qadariyyah Naqsyabandiyyah that provides constructive series of modules which include repent shower (mandi taubat), zikr, waking up at night (qiyam al-lail), fasting, prayers and good conducts (Manam, 2014).

## Ethical approval

Our study was officially approved by the UniSZA Human Research and Ethics Committee (UHREC) with the reference number UHREC/2016/2/001.

## Sampling and sample size

Convenient sampling has been used to identify the participants. The sample size of at least 30 participants was deemed adequate to achieve the aims of this study (Hertzog, 2008; Moore, Carter, Nietert & Stewart, 2011). The requirements for study inclusion were: 1) existing participants of Inabah programme, 2) has been involved in drug misuse, 3) aged 18 and above and 4) has undergone detoxification process. The exclusion criteria consisted of: 1) possessing other chronic health problems that require medicine regularly, 2) possessing a mental disorder and 3) displays unacceptable behaviour – tendency to be violent, suicidal or criminal.

## Data collection procedure

Data collection was carried out in August, 2016. To begin with, the researchers explained about the study and invited participation from the potential participants. Verbal and written consents from participants were obtained simultaneously. Those who consented were asked to complete a brief personal information form entailing their socio-demographic details. Subsequently, they proceeded to complete the Sahlgrenska Academy Self-Reported

Cognitive Impairment Questionnaire (SASCI-Q) and Knowledge and Attitude (KA) survey.

# Study instruments

Three sets of questionnaire were used to accomplish the objectives proposed.

## Personal Information Form

All participants initially completed a Personal Information Form, which comprised of demographic questions recording several basic details about the participants' demographic characteristics (i.e. gender, age, race, marital status, religion, education level, occupation and monthly income ) and drug addiction history (i.e. duration of addiction, type of illicit drug used, method of use, reason for drug use, history of detention and imprisonment, smoking and alcohol consumption habits, current).
Sahlgrenska Academy Self-Reported Cognitive Impairment Questionnaire (SASCI-Q)

Cognitive impairment was measured via the Malay version of the Sahlgrenska Academy Self-Reported Cognitive Impairment Questionnaire (SASCI-Q. This Malay translated version was produced based on the English SASCI-Q (Eckerstrom et al., 2013), which was developed as a tool to examine cognitive impairment. The questionnaire was forward and backward translated into Malay language by two independent translators to ensure that all items were fully understood by participants in order to capture their true perception concerning the questions asked and convey the similar meaning as found in the original instrument. Cross-cultural adaptations were also conducted to polish the items and reviewed by an expert committee.

This instrument was collectively categorised into two separate profiles defined as Cognitive Impairment and Cognitive Functioning whereby each profile consisted of 29 items and 24 items respectively. Six domains were assessed in Cognitive Impairment which were Memory (18 items), Attention/Speed (3 items), Executive (2 items), Language (1 items), Mixed Domain (4 items) and Others (1 items). As for Cognitive Functioning, three domains were evaluated namely Current Cognitive Function (8 items), Cognitive Function for Previous 10 years (8 items) and Cognitive Function at 25 years (8 items).

The eight items in Cognitive Impairment Profile were scored on a 4-point scale while sixteen items were based on a 5-point scale and five items on a 6-point scale. The response categories for each item were different due to the nature of each practice. For example, the 4-point scale item which asked "Some people have difficulties learning phone numbers by heart. How did that apply to you in the last month?" had the following response categories - "Not at all", "Slightly", "Moderately" and "Completely". Another example for a 5-point scale item, "In the last month, have you experienced memory problem?" had the following response categories - "No", "Yes, but less often than once a week", Yes, at least once a week", "Yes, at least three times a week" and "Yes, at least once a day" whereas for a 6-point scale item, "In the last month, have you had difficulties remembering what you have read?" was scored on the following response categories - "No", "Yes, on single ocassion", "Yes, in less that half of all ocassion", "Yes, in about half of all ocassions", "Yes, in more than half of all ocassion" and "Yes, on every ocassion". Multiple Likert responses were similarly used in Cognitive Functioning Profile with 7-point scale ranging from 1 ("very poor") to 7 ("very good"). All scores in this instrument were linearly transformed into 0 to 100. The overall score was derived from the mean of all items. A higher score for both profiles indicated a better cognitive status. Cronbach's alpha for overall cognitive status was 0.928 and 0.921 for Cognitive Impairment and Cognitive Functioning respectively, demonstrating acceptable values of greater than 0.70.

## Knowledge and Attitude (KA) Survey

Another instrument employed was the KA Survey (Balsam Mahdi et al,. 2000) where the original English version was initially adapted and translated into Malay version using forward and backward translation by two of independent expert translators. This survey consisted of 39 items of which four items sought general information. Another 35 items explored the knowledge and attitudes about drug use, drug users and drug-related issues. Two domains - Knowledge (19 items) and Attitude (16 items) were included in this survey. Each item was scored on a

7 - point Likert-scale from 1 (“Strongly disagree) to 7 (“Strongly agree”). All scores in this instrument were again transformed into 0 to 100 scales so that higher scores indicated better knowledge and attitude level among respondents. The internal consistency reliability of this instrument as measured by Cronbach’s alpha was 0.836 for Knowledge and 0.736 for Attitude, confirming its construct.

## Statistical analysis

Data was analysed using Statistical Package for Social Science (SPSS) version 23.0 for Windows (SPSS, Inc.). All socio-demographic data was analysed descriptively and presented as frequencies and percentages. Wherever relevant, chi-square test for goodness of fit was employed to test for homogeneity of categorical variables. Since the data was not normally distributed as indicated in the significant value of Shapiro-Wilk statistics ($p < 0.05$), Mann-Whitney U test was subsequently utilised to test for group differences based on socio-demographic variables (presented as mean rank and its corresponding p value). The socio-demographic variables concerning age and age when drug addiction started were used to compare between cognitive status. Overall cognitive status was regrouped into Good Cognitive Status ($\geq 66.2$) and Poor Cognitive Status ($< 66.2$) based on the sample median in order to compare KA levels between these groups. The value of $p < 0.05$ was considered statistically significant.

# Results

During this study, a total of 50 participants were undergoing Inabah treatment in Pusat Baitul Taubah. After screening, 37 participants were eligible for this study. Thirteen participants were excluded from the study because they have not undergone detoxification (n = 5), were non-drug misusers (n = 3) and were under the age of 18 years (n = 5).

## Socio-demographic characteristics

For the final sample, the mean age of participants was 28.4 ± 7.0 years, ranging from 18 to 42 years. They were all Malay males, Muslim and most have had PMR/SRP/LCE qualification (45.9%), began the addiction at the age of 18 to 26 years old (62.2%) and were self - employed (62.2%). Majority earned less than RM1,500 (USD 356) monthly (73.0%). Further details are shown in Table 1.

## General cognitive status

The general cognitive status subscale scores were shown in Table 2 below. Generally, the highest domain score for Cognitive Impairment profile was for Others domain (mean = 85.81 ± 26.71) followed by Memory (mean = 80.72 ± 19.15) and Mixed domain (mean = 77.89 ± 19.55) while Attention (mean = 75.53 ± 22.18) and Executive (mean = 69.37 ± 28.47) showed the poorest scores among all the domains. For Cognitive Functioning, Current Cognitive Function emerged the highest (80.72 ± 19.15).

The total score for both cognitive status profiles (Cognitive Impairment and Cognitive Functioning) showed rather encouraging ratings (mean = 74.17 ± 18.51 and 54.65 ± 16.03). Anyhow, the Overall Cognitive Score (mean = 66.18 ± 13.28).

## General KA profile

The overall KA level (Table 3) was considered moderate (mean = 57.29 ± 12.51). Between both domains, Attitude demonstrated a higher score (mean = 61.42 ± 13.49) compared to its counterpart.

**Table 1. Socio-demographic characteristics (n=37).**

| Variable | Frequency (n) | Percentage (%) | $\chi^2$ (df) | *p* value* |
|---|---|---|---|---|
| **Age (mean ± SD)** | 28.4 ± 7.0 | - | 3.27 (1) | 0.071 |
| **18-30 years** | 24 | 64.9 | | |
| **31-40 years** | 13 | 35.1 | | |
| **Marital status** | | | 38.00 (2) | *< 0.001* |
| **Single** | 30 | 81.1 | | |
| **Married** | 4 | 10.8 | | |
| **Widowed** | 3 | 8.1 | | |
| **Employment** | | | 11.92 (1) | *0.001* |
| **Employed** | 29 | 78.4 | | |
| **Unemployed** | 8 | 21.6 | | |
| **Education** | | | 25.76 (5) | *< 0.001* |
| **Not attending school** | 4 | 10.8 | | |
| **Primary** | 2 | 5.4 | | |
| **SRP / PMR / LCE** | 17 | 45.9 | | |
| **SPM / MCE / SPMV** | 7 | 18.9 | | |
| **STPM / Diploma** | 5 | 13.5 | | |
| **Degree or equivalent** | 2 | 5.4 | | |
| **Age of starting addiction** | | | 2.19 (1) | 0.139 |
| **10 - 17 years** | 14 | 37.8 | | |
| **18 - 26 years** | 23 | 62.2 | | |
| **Monthly income** | | | 7.81 (1) | *0.005* |
| **RM1, 500 and below** | 27 | 73.0 | | |
| **RM1, 501 and above** | 10 | 27.0 | | |

*Chi-square test for goodness of fit; p<0.05 = significant.
SD = standard deviation

**Table 2.General Cognitive status (n=37).**

| Domain | COGNITIVE IMPAIRMENT | | | | |
|---|---|---|---|---|---|
| | **Mean** | **SD** | **Median** | **Range** | **Min, Max** |

| | | | | | |
|---|---|---|---|---|---|
| **Memory** | 80.72 | 19.15 | 87.81 | 30.78 – 98.75 | 0.00 – 100.00 |
| **Attention** | 75.53 | 22.18 | 80.56 | 6.67 – 100.00 | 0.00 – 100.00 |
| **Executive** | 69.37 | 28.47 | 66.67 | 0.00 – 100.00 | 0.00 – 100.00 |
| **Language** | 81.08 | 30.53 | 100.00 | 0.00 – 100.00 | 0.00 – 100.00 |
| **Mixed domain** | 77.89 | 19.55 | 82.22 | 22.22 – 100.00 | 0.00 – 100.00 |
| **Others** | 85.81 | 26.71 | 100.00 | 0.00 – 100.00 | 0.00 – 100.00 |
| **Total Cognitive Impairment** | 74.17 | 18.51 | 85.83 | 26.67 – 98.02 | 0.00 – 100.00 |

| **Domain** | **COGNITIVE FUNCTIONING** | | | | |
|---|---|---|---|---|---|
| | **Mean** | **SD** | **Median** | **Range** | **Min, Max** |
| **Current Cognitive Function** | 80.72 | 19.15 | 87.81 | 30.78 – 98.75 | 0.00, 100.00 |
| **Cognitive Function for previous 10 years** | 75.53 | 22.18 | 80.56 | 6.67 – 100.00 | 0.00, 100.00 |
| **Total Cognitive Functioning** | 54.65 | 16.03 | 65.03 | 18.75 – 84.38 | 0.00, 100.00 |
| **Overall Cognitive Status** | **66.18** | **13.28** | **63.38** | **23.99 – 87.37** | **0.00, 100.00** |

**Table 3.General KA profile (n=37).**

| **Domains** | **KA** | | | | |
|---|---|---|---|---|---|
| | **Mean** | **SD** | **Median** | **Range** | **Min, Max** |
| **Knowledge** | 61.42 | 13.49 | 61.84 | 0.00 – 80.26 | 0.00, 100.00 |
| **Attitude** | 53.17 | 13.44 | 51.56 | 0.00 – 79.69 | 0.00, 100.00 |
| **Overall KA** | **57.29** | **12.51** | **56.66** | **0.00 – 79.98** | **0.00, 100.00** |

# Comparisons of cognitive status by socio-demographic variables

## Age group

Overall, there was a significant difference in Cognitive Impairment profile between older and younger group in terms of Language ($p = 0.046$), in which the older group possessed clearly lower cognitive level. In fact, the general trend showed that the older group recorded lower scores for most of the domains in cognitive impairment except for Memory.

For Cognitive Functioning profile, the older group had better scores for all domains indicating less impairment

compared to their younger counterparts. However, no significant difference was detected in any domain. The overall cognitive status for the older group was somehow more favourable (p = 0.390). Further details are shown in Table 4.

## Age group when addiction started

Across the sample, there was no significant difference in Overall Cognitive Score between the age group when drug addiction began. Nonetheless, the older group showed worse impairment in Memory and Executive whereas younger group was poorer in other domains in such as Attention, Language, Mixed and Others. The total cognitive impairment score showed that when addiction started later, less cognitive impairment was experienced (mean rank = 19.1 versus 18.9)

However, in viewing the Total Cognitive Functioning for this profile, the older group seemed to exhibit better profile compared to younger group although no significant difference was found. Table 5 displays the details.

**Comparison of KA profile by Overall Cognitive Score**

The overall trend of KA profile based on Overall Cognitive Score demonstrated that those with better cognitive status (median ≥ 66.2) possessed relatively more favourable Knowledge (60.4 ± 16.9) as well as Overall Knowledge & Attitude (57.3 ± 16.2). Refer to Table 6.

**Table 4. Comparison of cognitive status based on age group (n=37).**

| COGNITIVE IMPAIRMENT | | | | | | |
|---|---|---|---|---|---|---|
| **Domains** | **Mean rank** | | **Median (IqR)** | | | |
| | **18 -30 years** | **31-45 years** | **18 -30 years** | **31-45 years** | **z stat[a]** | ***p* valu** |
| **Memory** | 18.6 | 19.7 | 88.03 (27.73) | 87.81 (21.48) | -0.29 | 0.775 |
| **Attention** | 20.2 | 16.7 | 88.89 (21.53) | 73.89 (36.11) | -0.95 | 0.340 |
| **Executive** | 19.3 | 18.5 | 75.00 (41.67) | 66.67 (41.67) | -0.19 | 0.846 |
| **Language** | 21.3 | 14.8 | 100.00 (15.00) | 80.00 (60.00) | -1.99 | *0.046* |
| **Mixed domain** | 20.2 | 16.8 | 86.04 (22.40) | 80.42 (34.44) | -0.93 | 0.218 |
| **Others** | 19.5 | 18.1 | 100.00 (25.00) | 100.00 (25.00) | -0.44 | 0.123 |
| **Total Cognitive Impairment** | 19.3 | 18.5 | 87.40 (20.40) | 83.27 | -0.22 | 0.824 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | (25.69) | | |
| **COGNITIVE FUNCTIONING** | | | | | | | |
| **Domains** | **Mean rank** | | **Median (IqR)** | | **z stat[a]** | ***p* valu** | |
| | **18 -30 years** | **31-45 years** | **18 -30 years** | **31-45 years** | | | |
| **Current cognitive function** | 18.6 | 19.9 | 54.69 (39.06) | 59.38 (15.63) | -0.34 | 0.738 | |
| **Cognitive function for previous 10 years** | 18.1 | 20.7 | 50.00 (31.25) | 59.38 (20.31) | -0.72 | 0.472 | |
| **Total Cognitive Functioning** | 18.1 | 20.7 | 50.00 (31.65) | 60. 94 (10.16) | -0.72 | 0.474 | |
| **Overall Cognitive Score** | **17.9** | **21.1** | **63.68 (19.94)** | **71.03 (11.70)** | **-0.86** | **0.390** | |

[a]*Mann-Whitney U test; p < 0.05 = significant*

**Table 5: Comparison cognitive status based on age group when drug addiction started (n=37).**

| **COGNITIVE IMPAIRMENT** | | | | | | |
|---|---|---|---|---|---|---|
| Domains | **Mean rank** | | **Median (IqR)** | | **z stat[a]** | ***p* valu** |
| | **10 - 17 years** | **18 - 26 years** | **10 - 17 years** | **18 - 26 years** | | |
| **Memory** | 19.6 | 18.7 | 88.56 (41.02) | 87.81 (17.87) | -0.295 | 0.802 |
| **Attention** | 18.6 | 19.3 | 81.39 (37.64) | 80.65 (23.33) | -0.19 | 0.849 |
| **Executive** | 22.7 | 16.8 | 83.33 (33.33) | 66.67 (33.34) | -1.64 | 0.849 |
| **Language** | 17.1 | 20.1 | 100.00 (65.00) | 100.00 (20.00) | -0.94 | 0.349 |
| **Mixed domain** | 17.9 | 19.7 | 84.17 (34.49) | 82.20 (20.00) | -0.47 | 0.638 |
| **Others** | 18.2 | 19.5 | 100.00 (25.00) | 100.00 (25.00) | -0.42 | 0.677 |
| **Total Cognitive** | 18.9 | 19.1 | | | -0.22 | 0.824 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Impairment** | | | 82.81 (40.88) | 86.20 (18.84) | | |
| **COGNITIVE FUNTIONING** | | | | | | |
| **Domains** | **Mean rank** | | **Median (IqR)** | | **z stat[a]** | ***p* valu** |
| | **10 - 17 years** | **18 - 26 years** | **10 - 17 years** | **18 - 26 years** | | |
| **Current cognitive function** | 17.9 | 19.7 | 56.25 (17.19) | 59.38 (40.63) | -0.47 | 0.638 |
| **Cognitive function for previous 10 years** | 16.9 | 20.2 | 48.44 (31.25) | 56.25 (25.00) | -0.89 | 0.370 |
| **Total Cognitive Functioning** | 17.5 | 19.9 | 53.13 (24.22) | 57.81 (26.56) | -0.67 | 0.501 |
| **Overall Cognitive Status** | **18.1** | **19.5** | **65.80 (21.30)** | **69.17 (17.30)** | **-0.38** | **0.707** |

[a]*Mann-Whitney U test; p < 0.05 = significant*

**Table 6. Trend in KA profile based on Overall Cognitive Score**

| | **Mean (SD)** | | |
|---|---|---|---|
| **Domains** | **Poor Cognitive Status (n = 19)** | **Good Cognitive Status (n = 18)** | ***p* value** |
| Knowledge (K) | 60.4 (16.9) | 62.5 (9.1) | 0.939 |
| Attitude (A) | 54.2 (16.8) | 52.1 (9.1) | 0.241 |
| Overall Knowledge & Attitude (KA) | 57.3 (16.2) | 57.3 (7.5) | 0.403 |

*Mann-Whitney U test; p < 0.05 = significant
Poor Cognitive Status = Overall Cognitive Status median < 66.2
Good Cognitive Status = Overall Cognitive Status median ≥ 66.2

# Discussion

The assessment of cognitive impairment is now an emerging component of healthcare outcome evaluation as evidenced by numerous related studies because it enabled us to estimate the total burden of problem as well as treatment impacts on an individual. This is undoubtedly crucial for drug misusers (Harrell et al, 2014). Consequently, cognitive status measures are urgently required to be incorporated in the elucidation of addiction treatments. Our findings revealed that the cognitive status was somehow impaired among our sample, whereby the younger group reported poorer cognition. On the other hand, the age when addiction began also seemed to

influence the overall cognitive status, which was better for the older group. The Overall KA profile was only moderate, with comparatively poorer Knowledge profile when compared to Attitude.

Since executive functioning was related to difficulties in problem solving and multi – tasking, it has emerged as the most impaired aspect. A finding revealed that 70% of drug misusers presented some type of neuropsychological deterioration, regardless the type of substance consumed (University of Granada, 2011). Deterioration was registered to a large extent in the working memory, and in fluency, flexibility, planning, multitask ability and interference (University of Granada, 2011). Significant differences between the older and younger group in Language domain was also apparent. Language processing which is a higher – level cognitive function may also be affected by age. Speech and language processing are largely intact in older adults under normal conditions, although processing time may be somewhat slower than in young adults. Older adults were shown to exhibit the occasional word-finding difficulty and appeared to have few difficulties in processing ongoing speech (Riddle, 2007), hence thisability seemed to be unsiprisingly further affected by drug addiction.

In addition, this study also revealed that the older group has a generally higher cognitive impairment in most domains compared to the younger ones. This was in line with other researchers' investigation. Salthouse (2009) revealed that cognitive impairment in young users was less extensive compared to adults as cognitive performance usually begins to decline when the individuals are in their 20's or 30's. Cognitive status was also clearly different between younger and older people at the start of addiction. The group that started addiction at younger age has higher cognitive impairment because they were understandably exposed to the abused substances for longer periods, thereby prolonging the negative effects in the brain. Based on a study on brain functioning, the cognitive functioning was particularly affected by excessive use (Harell, 2014). With continued drug use, cognitive deficits ensue that exacerbate the difficulty of establishing sustained abstinence (Gould, 2010).

Those with good cognitive status scored higher for most KA domain except for Attitude. This finding was consistent with other research whereby, the attitude of drug addicts was reported to be negative (Bryan, 2000). On the other hand, Knowledge has been proven by a previous study to be adequate but there were still limited awareness that drove drug addiction problem (Nebhinani, 2013); Adogu, 2015). It is generally understood that the better the cognition level is, the more favourable would be the KA. A study reported after a semester – long course focusing on information or awareness about drug – related attitudes and behaviours, there were reduction on drug use incidence and the related negative consequences among students who had violated campus drug regulations (Heckman, Dykstra & Collins, 2012).Another study proclaimed that the attitudes were predominantly assertive and were directly associated to their academic qualifications (Moreira, Silveira & Andreoli, 2009).

Limitations in our study included a relatively small convenience sample, limiting the statistical significance of our findings. Our recruitment also only encompassed a single centre in Kelantan, hence our findings could not be generalized to the entire population of drug addicts in Malaysia. Anyhow our aim was only to investigate this particular of group individuals undergoing Inabah therapy. Further, more extensive investigations are needed to provide more significant findings with regard to cognitive and KA issues among drug addicts in the country.

# Conclusion

In summary, this study has revealed that cognitive status among drug addicts in both profiles was somehow impaired for most domains and their Knowledge was better than Attitude. Significantly poorer status in Language domain was also found within the older addicts. In terms of age group when drug addiction began, there was no significant difference for all domains but generally, the younger group reported less favourable cognitive status in most domains. The general trend further disclosed that drug addicts who has good cognitive status possessed better Knowledge but less encouraging Attitude. Because of this fact, future studies with larger samples are highly recommended to determine the effects of Inabah on Overall Cognitive Status and KA profiles among drug addicts undergoing such programme.

**Disclosure Statement**

All authors of this article declare they have no conflicts of interest.

**ACKNOWLEDGEMENT**
The authors wished to convey their appreciation to Madam Nuur Adila Mohd Ali, the participants of Inabah programme and the staff at Pusat Rawatan Baitul Taubah, Pasir Putih, Kelantan, Malaysia. We specifically thank Mr. Phakarudin Bin Abdul Moti, Mr. Wan Naznan Bin Mohd Nori, Mr. Zulhilmi Bin Haslan and Mr. Zulmanrafiky Bin Ibrahim for their kind cooperation, help and support which eventually facilitated the data collection process. The material presented was based on work supported by the UniSZA Special Research Grant Scheme (SRGS) grants no. R177 and R178.

# References

Agensi Anti Dadah Kebangsaan. (2015). Maklumat Dadah 2015. Retrieved December 06, 2016, from http://www.adk.gov.my/web/guest/dadah.

Adogu, P. O. U., Njelita, I. A., Egenti, N. B., Ubajaka, C. F., & Modebe, I. A. (2015). Awareness, Knowledge, Perception and Attitude towards Prescription Medicines
Abuse among Medicines Prescribers and Dispensers in Nnewi Nigeria. Pharmacology & Pharmacy, 6(5), 254.

Balsam, M. N. A., Maher, D. F. F., Hasananin, F. G., Mohammed, A. A. Q., Maged, E., & Bryan, A., Moran, R., Farrell, E., & O'Brien, M. (2000). Drug-Realted Knowledge Attitudes and Beliefs in Ireland. Dublin: Drug Misuse Research Division.

Davis, P. E., Liddiard, H., & McMillan, T. M. (2002). Neuropsychological deficits and opiate abuse. Drug and alcohol dependence, 67(1), 105-108.

Eckerström, M., Skoogh, J., Rolstad, S., Göthlin, M., Steineck, G., Johansson, B., & Wallin, A. (2013). Sahlgrenska Academy Self-reported Cognitive Impairment Questionnaire (SASCI-Q)–a research tool discriminating between subjectively cognitively impaired patients and healthy controls. International psychogeriatrics, 25(03), 420-430.
Ersche, K. D., Turton, A. J., Chamberlain, S. R., Müller, U., Bullmore, E. T., & Robbins, T. W. (2012). Cognitive dysfunction and anxious-impulsive personality traits are endophenotypes for drug dependence. American Journal of Psychiatry, 169(9), 926- 936.

Gould, T. J. (2010). Addiction and cognition. Addiction science & clinical practice, 5(2). Harrell, P. T., Mancha, B. E. E., Martins, S. S., Mauro, P. M., Kuo, J. H., Scherer, M., ... & Latimer, W. W. (2014). Cognitive performance profiles by latent classes of drug use. The American Journal on Addictions, 23(5), 431-439.

Heckman, C. J., Dykstra, J. L., & Collins, B. N. (2011). Substance-related knowledge, attitude, and behaviour among college students: Opportunities for health education. Health education journal, 70(4), 383-399.

Hertzog, M. A. (2008). Considerations in determining sample size for pilot studies. Research in nursing & health, 31(2), 180-191.

Ibrahim, M., Dara, A., Al Abdul, M. M., Sontang, M., & Mohamad, N. A. A. (2014). Factors Determining The Efficiency of The Drug Prevention Program of Youth Volunteers In Kuala Terengganu, Malaysia. Journal of Environmental Research and Development, 8(3A), 767.

Khalid, M. Y. (2008). Psychospiritual therapy approach for drug addiction rehabilitation. JAM,(3), 143-151.

Kuypers, K. P., Theunissen, E. L., van Wel, J. H., Perna, E. B. D. S. F., Linssen, A., Sambeth, A., ... & Ramaekers, J. G. (2016). Verbal Memory Impairment in Polydrug Ecstasy Users: A Clinical Perspective. PloS one, 11(2), e0149438.

Matheson, C., Jaffray, M., Ryan, M., Bond, C. M., Fraser, K., Kirk, M., & Liddell, D. (2014). Public opinion of drug treatment policy: exploring the public's attitudes, knowledge, experience and willingness to pay for drug treatment strategies. International Journal of Drug Policy, 25(3), 407-415

Moore, C. G., Carter, R. E., Nietert, P. J., & Stewart, P. W. (2011). Recommendations for planning pilot studies in clinical and translational research. Clinical and translational science, 4(5), 332-337.

Moreira, F. G., Silveira, D. X. D., & Andreoli, S. B. (2009). Knowledge and attitudes related to drug abuse and prevention displayed by public school educators. Revista Brasileira de Psiquiatria, 31(2), 95-100.

Nebhinani, N., Nebhinani, M., Misra, A. K., & Grewal, S. (2013). Substance-Related Knowledge and Attitude In School and College Students. German Journal of Psychiatry, 16(1).

Riba, J., Valle, M., Sampedro, F., Rodríguez-Pujadas, A., Martínez-Horta, S., Kulisevsky, J., & Rodríguez-Fornells, A. (2015). Telling true from false: cannabis users show increased susceptibility to false memories. Molecular psychiatry, 20(6), 772-777.

Riddle, D. R. (Ed.). (2007). Brain aging: models, methods, and mechanisms. CRC Press. Salthouse, T. A. (2009). When does age-related cognitive decline begin?. Neurobiology of aging, 30(4), 507-514.

Seghatoleslam, T., Habil, H., Hatim, A., Rashid, R., Ardakan, A., & Motlaq, F. E. (2015). achieving a spiritual therapy standard for drug dependency in Malaysia, from an Islamic perspective: Brief review article. Iranian journal of public health, 44(1), 22.

Sinha, R., & Jastreboff, A. M. (2013). Stress as a common risk factor for obesity and addiction. Biological psychiatry, 73(9), 827-835.

University of Granada. (2011, February 3). Drug-abusers have difficulty to recognize negative emotions as wrath, fear and sadness, study finds. ScienceDaily. Retrieved February 20, 2017 from www.sciencedaily.com/releases/2011/02/110203082521.htm

Vonmoos, M., Hulka, L. M., Preller, K. H., Minder, F., Baumgartner, M. R., & Quednow, B. B. (2014). Cognitive impairment in cocaine users is drug-induced but partially reversible: evidence from a longitudinal study. Neuropsychopharmacology, 39(9), 2200-2210.