The Egyptian Journal of Neurology,
Psychiatry and Neurosurgery

## RESEARCH

# Self-diagnose is associated with knowledge and attitude towards mental illness of university students in Indonesia

Naufal Arif Ismail[1]* , Intan Kusumaningtyas[1] and Moetrarsi Sri Kanapsijah Firngadi[2]

## Abstract

**Background**  Mental illness is still stigmatized and poorly understood in Indonesian society, but university students could be a key target for promoting positive attitudes and increasing awareness. This study aims to explore the knowledge and attitudes of university students in Indonesia toward mental illness and to identify associated factors, emphasizing self-diagnosis.

**Method**  An analytical cross-sectional study on university students in Yogyakarta, Indonesia, was conducted from September to November 2022. Participants completed an online questionnaire about their sociodemographic data, mental health knowledge (utilized Mental Health Knowledge Schedule questionnaire), and attitudes toward mental illness (utilized Community Attitude to Mental Illness Inventory questionnaire). Univariate, bivariate, and multivariate logistic regression were performed to analyze collected data.

**Results**  A total of 402 university students were included in the study. Results demonstrated that half of the students had good mental illness knowledge (50.7%), and slightly more than half had favorable attitudes (53.0%). Self-diagnosis was significantly associated with poorer knowledge and negative attitudes (adjusted odds ratio [AOR]: 2.31, 95% confidence interval [CI] 1.19 to 4.50 and AOR: 2.12, 95% CI 1.13 to 3.99; $P < 0.05$, respectively). Additionally, students who had never studied psychology or psychiatry and had a family mental illness history were at higher risk ($P < 0.05$) for poor knowledge of mental illness (AOR: 2.24, 95% CI 1.18 to 4.25 and AOR: 1.82, 95% CI 1.00 to 3.30, respectively). Interestingly, students with lower monthly family incomes had more positive attitudes (AOR: 0.39, 95% CI 0.18 to 0.86; $P < 0.05$). A very weak negative correlation ($\rho = -0.173$; $P < 0.001$) between mental illness knowledge and attitudes was observed.

**Conclusion**  Promoting awareness and knowledge about mental health, as well as preventing self-diagnosis, is crucial in addressing the lack of knowledge and negative attitudes toward mental illness among university students in Indonesia, which is expected to play a role in the wider community ultimately.

**Keywords**  Attitude, Indonesia, Knowledge, Mental illness, Self-diagnosis, Stigma, University students

## Background

Mental illness is a growing concern globally, with from 1990 to 2019, the number of disability-adjusted life-years (DALYs) worldwide due to mental disorders rose from 80.8 million to 125.3 million. The proportion of global DALYs linked to mental disorders also increased from 3.1% to 4.9% during this period [1]. According to Basic Health Research (Riskesdas) 2018 in Indonesia,

*Correspondence:
Naufal Arif Ismail
naufalarifismail@gmail.com
[1] Faculty of Medicine, Universitas Islam Indonesia, Yogyakarta, Indonesia
[2] Department of Psychiatry, Faculty of Medicine, Universitas Islam Indonesia, Yogyakarta, Indonesia

Ismail *et al. Egypt J Neurol Psychiatry Neurosurg*      (2023) 59:162

Page 2 of 9

the prevalence of schizophrenia and depression are 6.7‰ and 6.1%, respectively. Despite the high prevalence of these mental health conditions, many people who require treatment do not receive it. Nearly half (48.9%) of individuals with schizophrenia do not seek treatment due to reasons such as believing that they are already healthy (36.1%) or not wanting to visit a healthcare provider (33.7%) regularly. On the other hand, only 9% of individuals with depression who require therapy receive it [2].

There is still a significant stigma surrounding mental health issues, leading to a lack of awareness and understanding of mental illness. This issue is particularly pertinent in Indonesia, where mental health is often overlooked and considered a taboo subject [3, 4]. As a result, help-seeking behavior becomes less, especially for those who need it. Targeting university students through an intervention may be effective in promoting a positive and lasting attitude toward individuals with mental illness. Therefore, addressing the lack of knowledge and negative attitudes and behaviors toward mental illness among university students is crucial. This can be achieved by increasing awareness and knowledge about mental health, as well as promoting help-seeking and support among peers and the wider community [5, 6]. By doing so, we can encourage young adults to develop an empathetic and supportive mindset towards mental illness, which can persist throughout their adult lives.

Several studies have investigated the knowledge and attitudes of the general population and students toward mental illness in Indonesia [7–9]. However, none of these studies specifically examine self-diagnosis in association with knowledge and attitude, which could significantly influence individuals' perceptions and attitudes toward mental illness. A systematic review has suggested that self-diagnosis is less accurate than a clinical diagnosis for common conditions in primary care [10]. Moreover, although artificial intelligence has progressed rapidly to date, it cannot completely replace the role and relationship of the traditional doctor–patient in diagnosing patients [11]. These outcomes might also be applicable in psychiatry settings. As a result, exploring self-diagnosis is crucial.

The present study aims to explore the knowledge and attitudes of university students in Indonesia toward mental illness and to identify associated factors, with a particular emphasis on evaluating the practice of self-diagnosis. This study will contribute to a better understanding of the current situation regarding mental health among this important demographic group in Indonesia, which is expected to help build better mental health awareness in society.

## Methods

### Study design

An analytical cross-sectional study was conducted from September to November 2022. A self-report questionnaire was shared online using Google Form links via institution email, LINE, and WhatsApp to undergraduate students of a university in Yogyakarta, Indonesia. Incomplete data filling and refusal to participate were excluded from this study.

### Sample size

The institution where the study was conducted is estimated to have 23,000 active students in 2022 (*N total*). The minimum sample size is calculated based on "the Sample Size for a Proportion or Descriptive Study" using the online application www.openepi.com. The hypothesized frequency of outcome (*p*) was 50%, the acceptable margin of error (*d*) was 5%, and the design effect (*DEFF*) was 1.0. The calculation resulted in a minimum sample size of 378 for a confidence level of 95%.

### Questionnaire

A self-reported questionnaire consists of three parts. The first part included students' sociodemographic characteristics such as gender, age, the origin of residence, settlement, relationship status, family income, year of study, study program, history of studying psychology or psychiatry, personal mental illness, family mental illness, and direct contact with individuals with mental illness. In addition, we asked, "Who diagnosed your mental illness?" to confirm a personal mental illness history and include only those diagnosed by doctors, psychiatrists, or psychologists.

The second part included the 12-item Mental Health Knowledge Schedule (MAKS) questionnaire to evaluate knowledge in relation to stigma toward mental illness. This questionnaire was developed by Evans-Lacko et al. [12]. We use the Indonesian version of MAKS that was adapted with permission from Sari and Yuliastuti [9]. This questionnaire item consists of a 5-point scale to indicate strongly agree (scale = 5) or strongly disagree (scale = 1). Incorrectly stated items were reverse-coded to reflect the direction of the correct response [12]. Higher MAKS scores reflect better knowledge. We dichotomized participants' knowledge of mental illness using the mean score (41.31 ± 3.13) as the cut-off point (poor knowledge ≤ 41.31), as with similar methods previously reported [13]. The MAKS internal consistency (Cronbach's α) was 0.763.

The third part included the 40-item Community Attitude to Mental Illness Inventory (CAMI) questionnaire to evaluate attitudes toward mental illness. This questionnaire was developed by Taylor and Dear [14]. The

Ismail *et al. Egypt J Neurol Psychiatry Neurosurg*    (2023) 59:162

Page 3 of 9

Indonesian version of CAMI was used in this study with permission [9]. A 5-point scale was also applicable in this questionnaire; a scale of 5 indicated strongly disagree, and a scale of 1 for strongly agree. Reverse-coded was applied for negatively stated items. A favorable attitude is reflected by a lower score CAMI. We categorize attitudes as favorable and unfavorable, with the mean score ($111.50 \pm 5.99$) being a cut-off point (unfavorable attitude > 111.50), in accordance method to a previous study [13]. Cronbach's α for the CAMI questionnaire was 0.813.

### Statistical analysis

Collected data were statistically analyzed using IBM SPSS version 26 (Chicago, IL, USA). Descriptive data were presented as frequency, percentage, and, if applicable, mean ± standard deviation (SD), summarized into tables and graphs. Chi-square and Fisher's exact tests were performed in bivariate analysis. In addition, the correlation between MAKS and CAMI scores was analyzed using Spearman correlation. All variables in the Chi-square and Fisher's exact tests with a $P < 0.25$ were included in multivariate logistic regression. A $P < 0.05$ was considered statistically significant.

## Results

### Sociodemographic characteristics

This study involved 402 university students with a mean age of $20.13 \pm 1.46$. Most of them were females (74.9%), the origin of residents from the Yogyakarta and Central–East Java regions (61.9%), lived in urban areas (56.5%), were single (79.4%), and had a family income of > 2.72 million Indonesian Rupiah (IDR) (91.5%), 1 USD = 15,334 IDR in September 2022. The students' proportion in the fourth year of study (37.8%) and the program of non-medicine and psychology (58.5%) was prevalent. Furthermore, about 41.0% of students have never studied psychology or psychiatry. We recorded that the majority of students have no personal (90.8%) and familial mental illness histories (84.8%) and have never had direct contact with individuals with mental illness (64.9%) (see Table 1). However, at least 12.9% of students self-diagnosed (see Fig. 1).

### University students' knowledge and attitude toward mental illness

Overall, there was a slight difference between those with good (50.7%) and poor (49.3%) mental illness knowledge, as well as favorable (53.0%) and unfavorable (47.0%) attitudes (Fig. 2).

### Knowledge and associated factors toward mental illness

The results of the multivariate analysis demonstrated that having never studied psychology or psychiatry (adjusted odds ratio, AOR: 2.24, 95% confidence interval, CI 1.18 to 4.25), having a family mental illness history (AOR: 1.82, 95% CI 1.00 to 3.30), and did self-diagnosed (AOR: 2.31, 95% CI 1.19 to 4.50) were significant ($P < 0.05$) risk factors for poor knowledge of the mental illness (see Table 2).

### Attitude and associated factors toward mental illness

Participants with a monthly family income of ≤ 2.72 million IDR per month (AOR: 0.39, 95% CI 0.18 to 0.86) significantly ($P < 0.05$) have a better attitude towards mental illness. Meanwhile, those who did self-diagnose (AOR: 2.12, 95% CI 1.13 to 3.99) significantly ($P < 0.05$) had unfavorable attitudes toward mental illness (see Table 3).

### Correlation between knowledge and attitude toward mental illness

MAKS and CAMI scores displayed in Table 4 demonstrated a statistically significant negative correlation ($P < 0.001$), although this correlation is very weak ($\rho = -0.173$). This finding suggests that better knowledge (reflected by higher MAKS scores) corresponds to a more favorable attitude (reflected by lower CAMI scores) toward individuals with mental illness.

## Discussion

Indonesian university students' knowledge, attitudes, and associated factors toward mental illness have been identified. This study revealed a slight difference between knowledge and attitudes toward mental illness. Although 50.7% of the participants had good mental illness knowledge, only 53% had favorable attitudes toward individuals with mental illness. Such factors, including never studying psychology or psychiatry, and having a family history of mental illness, were significant risk factors for poor knowledge of the mental illness. To our knowledge, this study is the first to reveal that self-diagnosing among university students in Indonesia contributes to poor knowledge and unfavorable attitudes toward people with mental illness.

One of the significant risk factors associated with poor knowledge of mental illness was not having studied psychology or psychiatry formally. In line with previous studies, those who received formal education about psychiatry, such as medical students, tend to have higher knowledge of mental health [8, 15]. Our result emphasizes the need to improve students' mental health literacy and mental health education in university curriculums.

Our study found that self-diagnosis is a significant risk factor for poor knowledge and unfavorable attitudes toward mental illness. Self-diagnosing individuals often have inaccurate or incomplete knowledge about mental health conditions. It is crucial to highlight this finding because self-diagnosis may lead to a

Ismail *et al. Egypt J Neurol Psychiatry Neurosurg*      (2023) 59:162

Page 4 of 9

**Table 1** Sociodemographic characteristic of participants (*N* = 402)

| Variable | Frequency (*N*) | Percentage (%) |
|---|---|---|
| Gender | | |
| Female | 301 | 74.9 |
| Male | 101 | 25.1 |
| Age, mean ± SD | 20.13 ± 1.46 | |
| Origin of residence | | |
| Sumatera | 46 | 11.4 |
| Banten, West Java, and Jakarta | 69 | 17.2 |
| Yogyakarta and Central–East Java | 249 | 61.9 |
| Central–East Indonesia | 38 | 9.5 |
| Settlement | | |
| Urban | 227 | 56.5 |
| Rural | 175 | 43.5 |
| Relationship status | | |
| Single | 319 | 79.4 |
| Dating | 76 | 18.9 |
| Married | 7 | 1.7 |
| The family income per month (in a million IDR) | | |
| ≤ 2.72 | 34 | 8.5 |
| > 2.72 | 368 | 91.5 |
| Year of study | | |
| First | 74 | 18.4 |
| Second | 89 | 22.1 |
| Third | 87 | 21.6 |
| Fourth | 152 | 37.8 |
| Study program | | |
| Medicine and psychology | 167 | 41.5 |
| Non-medicine and psychology | 235 | 58.5 |
| Studying psychology or psychiatry history | | |
| Never | 165 | 41.0 |
| Lecture | 99 | 24.6 |
| Seminars/internet/others | 138 | 34.3 |
| Personal mental illness history | | |
| No | 365 | 90.8 |
| Yes | 37 | 9.2 |
| Family mental illness history | | |
| No | 341 | 84.8 |
| Yes | 61 | 15.2 |
| Direct contact with individuals with mental illness | | |
| No | 261 | 64.9 |
| Yes | 141 | 35.1 |

SD: standard deviation; IDR: Indonesian Rupiah (1 USD = 15,334 IDR in September 2022)

perpetuation of stereotypes and stigma surrounding certain mental health conditions. This happens when individuals use inaccurate or highly biased information to self-diagnose, which could result in negative assumptions about individuals with certain mental health conditions. Moreover, a previous study has reported that self-diagnosis among Indonesian university students can lead to mental health distress and interference with daily activities [16].

We observed that participants with a family history of mental illness did not make them well knowledgeable about mental illness. Contrary to our result, another study reported that those with a family history of mental illness tend to have good knowledge and attitudes toward
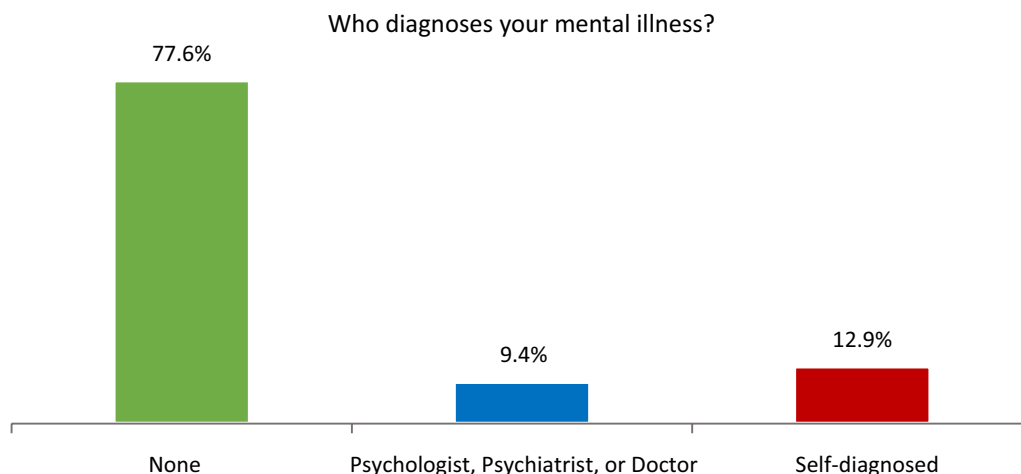
Ismail *et al. Egypt J Neurol Psychiatry Neurosurg*     (2023) 59:162

Page 5 of 9

**Who diagnoses your mental illness?**

[Bar chart: None 77.6%, Psychologist, Psychiatrist, or Doctor 9.4%, Self-diagnosed 12.9%]

**Fig. 1** Prevalence of self-diagnosed among university students. The researcher asked about the history of mental health illness and also asked who diagnosed the mental illness to confirm. Only those who answered that they were diagnosed by doctors, psychiatrists, and psychologists were categorized as having a history of mental health illness. The prevalence of self-diagnosis in this study was 12.9%
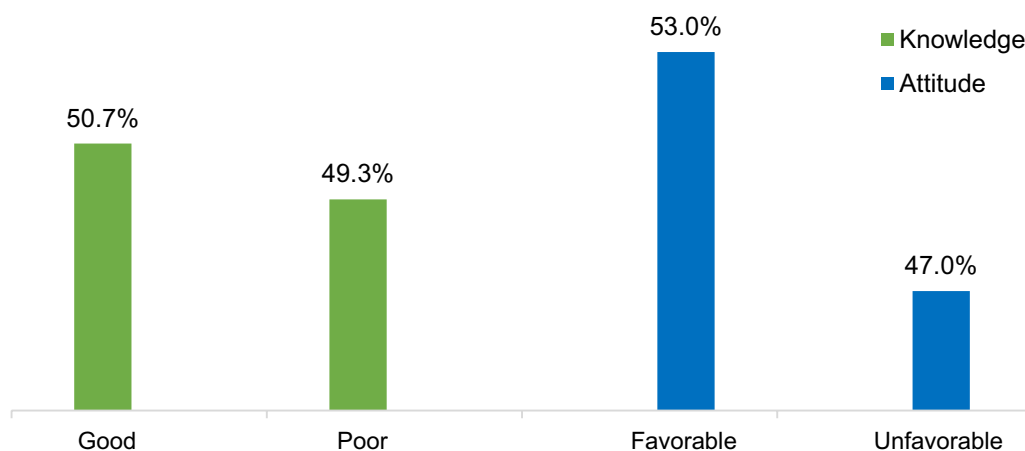
[Bar chart: Good 50.7%, Poor 49.3% (Knowledge); Favorable 53.0%, Unfavorable 47.0% (Attitude)]

**Fig. 2** Overview of knowledge and attitudes among students toward mental illness. The cut-off for knowledge is the mean total MAKS score (41.31), categorized as poor if ≤ 41.31 and good if > 41.31. Meanwhile, the cut-off for attitude is the mean total CAMI score (111.50), categorized as poor if > 111.50 and good if ≤ 111.50. Participants have slightly good knowledge and favorable attitudes percentage toward individuals with mental health problems

mental illness [17, 18]. In fact, several Indonesian societies often over-stigmatize people with mental illness, and the discriminatory practice in the form of pasung (a practice of confining and detaining mentally ill individuals for months to years) still exists today. Pasung is fairly commonly carried out by their family members, especially those living in rural areas and poorly educated [2, 7, 19]. As iron stocks, social controls, and agents of change, university students who are well-educated about mental health might be engaged in addressing this condition by promoting mental health awareness and reducing stigma in society.

Interestingly, our study revealed that participants with a lower family income had more favorable attitudes toward mental illness. This finding contradicts a previous study that demonstrated a negative association between socioeconomic status and attitudes toward mental illness because they tend to have negative emotions, high survival pressures, and poor social and psychological skills [13]. Meanwhile, a similar study demonstrated that income is not associated with attitudes toward mental illness [9]. However, the present study was conducted in a specific cultural context. Different cultures and settings of the study might have varied results.

Ismail *et al. Egypt J Neurol Psychiatry Neurosurg*      (2023) 59:162

Page 6 of 9

**Table 2** Association between variables of sociodemographic and knowledge

| Variable | Knowledge, N (%) | | COR (95% CI) | P | AOR (95% CI) | P |
|---|---|---|---|---|---|---|
| | Poor | Good | | | | |
| Gender | | | | | | |
|   Female | 140 (46.5) | 161 (53.5) | 0.65 (0.41 to 1.02) | 0.058 | 0.70 (0.43 to 1.14) | 0.152 |
|   Male | 58 (57.4) | 43 (42.6) | Reference | | Reference | |
| Origin of residence | | | | | | |
|   Sumatera | 21 (45.7) | 25 (54.3) | 0.90 (0.48 to 1.70) | 0.751 | | |
|   Banten, West Java, and Jakarta | 36 (52.2) | 33 (47.8) | 1.17 (0.69 to 2.00) | 0.558 | | |
|   Central–East Indonesia | 21 (55.3) | 17 (44.7) | 1.33 (0.67 to 2.64) | 0.417 | | |
|   Yogyakarta and Central–East Java | 120 (48.2) | 129 (51.8) | Reference | | | |
| Settlement | | | | | | |
|   Rural | 90 (51.4) | 85 (48.6) | 1.17 (0.79 to 1.73) | 0.444 | | |
|   Urban | 108 (47.6) | 119 (52.4) | Reference | | | |
| Relationship status | | | | | | |
|   Married | 3 (42.9) | 4 (57.1) | 0.79 (0.18 to 3.60) | 0.764 | | |
|   Dating | 40 (52.6) | 36 (47.4) | 1.18 (0.71 to 1.94) | 0.526 | | |
|   Single | 155 (48.6) | 164 (51.4) | Reference | | | |
| The family income per month (in a million IDR) | | | | | | |
|   ≤ 2.72 | 21 (61.8) | 13 (38.2) | 1.74 (0.85 to 3.59) | 0.127 | 1.19 (0.55 to 2.58) | 0.664 |
|   > 2.72 | 177 (48.1) | 191 (51.9) | Reference | | Reference | |
| Year of study | | | | | | |
|   First | 30 (40.5) | 44 (59.5) | 0.80 (0.46 to 1.40) | 0.434 | 0.66 (0.35 to 1.25) | 0.203 |
|   Second | 46 (51.7) | 43 (48.3) | 1.25 (0.74 to 2.12) | 0.398 | 0.89 (0.50 to 1.59) | 0.704 |
|   Third | 52 (59.8) | 35 (40.2) | 1.74 (1.02 to 2.97) | 0.041* | 1.53 (0.86 to 2.73) | 0.150 |
|   Fourth | 70 (46.1) | 82 (53.9) | Reference | | Reference | |
| Study program | | | | | | |
|   Non-medicine and psychology | 131 (55.7) | 104 (44.3) | 1.88 (1.26 to 2.81) | 0.002* | 1.26 (0.75 to 2.10) | 0.387 |
|   Medicine and psychology | 67 (40.1) | 100 (59.9) | Reference | | Reference | |
| Studying psychology or psychiatry history | | | | | | |
|   Never | 98 (59.4) | 67 (40.6) | 2.80 (1.67 to 4.70) | 0.000* | 2.24 (1.18 to 4.25) | 0.014* |
|   Seminars/internet/others | 66 (47.8) | 72 (52.2) | 1.75 (1.03 to 2.99) | 0.038* | 1.53 (0.81 to 2.91) | 0.195 |
|   Lecture | 34 (34.3) | 65 (65.7) | Reference | | Reference | |
| Personal mental illness history | | | | | | |
|  Yes | 12 (32.4) | 25 (67.6) | 0.46 (0.23 to 0.95) | 0.032* | 0.52 (0.24 to 1.10) | 0.088 |
|  No | 186 (51.0) | 179 (49.0) | Reference | | Reference | |
| Family mental illness history | | | | | | |
|  No | 175 (51.3) | 166 (48.7) | 1.74 (0.99 to 3.05) | 0.050 | 1.82 (1.00 to 3.30) | 0.048* |
|  Yes | 23 (37.7) | 38 (62.3) | Reference | | Reference | |
| Direct contact with individuals with mental illness | | | | | | |
|  No | 132 (50.6) | 129 (49.4) | 1.16 (0.77 to 1.75) | 0.471 | | |
|  Yes | 66 (46.8) | 75 (53.2) | Reference | | | |
| Did self-diagnosed | | | | | | |
|   Yes | 36 (69.2) | 16 (30.8) | 2.61 (1.40 to 4.88) | 0.002* | 2.31 (1.19 to 4.50) | 0.013* |
|  No | 162 (46.3) | 188 (53.7) | Reference | | Reference | |

IDR: Indonesian Rupiah (1 USD = 15,334 IDR in September 2022). COR: crude odds ratio. AOR: adjusted odds ratio

*Statistically significant ($P < 0.05$)

A similar finding to Hartini et al. [7], the current study also found a very weak negative correlation between knowledge and attitudes toward mental illness. Nevertheless, this result suggests that improving knowledge may lead to more favorable attitudes toward individuals with mental illness, particularly among university students.

Ismail *et al. Egypt J Neurol Psychiatry Neurosurg*     (2023) 59:162

Page 7 of 9

**Table 3** Association between variables of sociodemographic and attitude

| Variable | Attitude, N (%) | | COR (95% CI) | P | AOR (95% CI) | P |
|---|---|---|---|---|---|---|
| | **Unfavorable** | **Favorable** | | | | |
| Gender | | | | | | |
| Female | 141 (46.8) | 160 (53.2) | 0.97 (0.62 to 1.53) | 0.906 | | |
| Male | 48 (47.5) | 53 (52.5) | Reference | | | |
| Origin of residence | | | | | | |
| Sumatera | 21 (45.7) | 25 (54.3) | 1.03 (0.55 to 1.93) | 0.933 | | |
| Banten, West Java, and Jakarta | 34 (49.3) | 35 (50.7) | 1.19 (0.70 to 2.03) | 0.526 | | |
| Central–East Indonesia | 22 (57.9) | 16 (42.1) | 1.68 (0.84 to 3.36) | 0.137 | | |
| Yogyakarta and Central–East Java | 112 (45.0) | 137 (55.0) | Reference | | | |
| Settlement | | | | | | |
| Rural | 77 (44.0) | 98 (56.0) | 0.81 (0.54 to 1.20) | 0.288 | | |
| Urban | 112 (49.3) | 115 (50.7) | Reference | | | |
| Relationship status | | | | | | |
| Married | 5 (71.4) | 2 (28.6) | 2.93 (0.56 to 15.30) | 0.258[†] | | |
| Dating | 37 (48.7) | 39 (51.3) | 1.11 (0.67 to 1.83) | 0.683 | | |
| Single | 147 (46.1) | 172 (53.9) | Reference | | | |
| The family income per month (in a million IDR) | | | | | | |
| ≤ 2.72 | 11 (32.4) | 23 (67.6) | 0.51 (0.24 to 1.08) | 0.073 | 0.39 (0.18 to 0.86) | 0.020* |
| > 2.72 | 178 (48.4) | 190 (51.6) | Reference | | Reference | |
| Year of study | | | | | | |
| First | 38 (51.4) | 36 (48.6) | 1.45 (0.83 to 2.54) | 0.190 | | |
| Second | 44 (49.4) | 45 (50.6) | 1.34 (0.80 to 2.27) | 0.269 | | |
| Third | 43 (49.4) | 44 (50.6) | 1.34 (0.79 to 2.28) | 0.274 | | |
| Fourth | 64 (42.1) | 88 (57.9) | Reference | | Reference | |
| Study program | | | | | | |
| Non-medicine and psychology | 120 (51.1) | 115 (48.9) | 1.48 (0.99 to 2.21) | 0.054 | 1.50 (0.98 to 2.29) | 0.060 |
| Medicine and psychology | 69 (41.3) | 98 (58.7) | Reference | | Reference | |
| Studying psychology or psychiatry history | | | | | | |
| Never | 76 (46.1) | 89 (53.9) | 1.11 (0.67 to 1.84) | 0.678 | | |
| Seminars/internet/others | 70 (50.7) | 68 (49.3) | 1.34 (0.80 to 2.25) | 0.268 | | |
| Lecture | 43 (43.4) | 56 (56.6) | Reference | | | |
| Personal mental illness history | | | | | | |
| Yes | 20 (54.1) | 17 (45.9) | 1.36 (0.69 to 2.69) | 0.368 | | |
| No | 169 (46.3) | 196 (53.7) | Reference | | | |
| Family mental illness history | | | | | | |
| No | 152 (44.6) | 189 (55.4) | 0.52 (0.30 to 0.91) | 0.020* | 0.61 (0.34 to 1.10 | 0.101 |
| Yes | 37 (60.7) | 24 (39.3) | Reference | | Reference | |
| Direct contact with individuals with mental illness | | | | | | |
| No | 114 (43.7) | 147 (56.3) | 0.68 (0.45 to 1.03) | 0.068 | 0.74 (0.48 to 1.14) | 0.176 |
| Yes | 75 (53.2) | 66 (46.8) | Reference | | Reference | |
| Did self-diagnosed | | | | | | |
| Yes | 33 (63.5) | 19 (36.5) | 2.16 (1.18 to 3.95) | 0.011* | 2.12 (1.13 to 3.99) | 0.019* |
| No | 156 (44.6) | 194 (55.4) | Reference | | Reference | |

IDR: Indonesian Rupiah (1 USD = 15,334 IDR in September 2022). COR: crude odds ratio. AOR: adjusted odds ratio

[†] Fisher's exact test

*Statistically significant (*P* < 0.05)

Ismail *et al. Egypt J Neurol Psychiatry Neurosurg* (2023) 59:162

Page 8 of 9

**Table 4** Correlation between attitude and knowledge

| Correlation | ρ | P |
|---|---|---|
| MAKS score × CAMI score | − 0.173 | 0.000* |

Correlation analysis using Spearman

*Statistically significant ($P < 0.05$)

This study has some limitations, such as only including university students from a single university, which may limit the generalizability of the findings to other populations. This study used a cross-sectional design, making it difficult to establish causality or the direction of the observed associations. However, our study also has several strengths, including this is the first study in Indonesia to assess university students' self-diagnoses of mental illness, providing valuable insight into their perceptions of their own mental health. Our study used a comprehensive questionnaire that covered a wide range of topics related to mental illness, which allowed us to obtain detailed information on the participants' knowledge and attitudes. Also, this study provides an important baseline for future studies on mental health in Indonesia, highlighting the need for interventions to improve knowledge and attitudes toward mental illness among university students.

## Conclusions

In conclusion, the findings of this study highlight the need for mental health education and awareness campaigns targeted toward Indonesian university students, particularly those who have not studied psychology or psychiatry and those who engage in self-diagnosis. The results also suggest that improving mental health literacy may help reduce stigma and promote positive attitudes toward individuals with mental illness.

**Abbreviations**
DALYs     Disability-adjusted life-years
MAKS     Mental Health Knowledge Schedule
CAMI     Community Attitude to Mental Illness Inventory
SD     Standard deviation
IDR     Indonesian Rupiah
USD     United States Dollar
AOR     Adjusted odds ratio
CI     Confidence interval

**Availability of data and materials**
Data will be made available upon reasonable request, and the principal investigator will make the data available.

## Declarations

**Ethics approval and consent to participate**
Procedures and protocols of the study were ethically approved by The Ethics Committee of the Faculty of Medicine, Universitas Islam Indonesia, Yogyakarta, Indonesia (Number: 7/Ka.Kom.Et/70/KE/VIII/2022). Prospective participants were informed online about the study aims, procedures, and confidentiality regarding the data filled in was maintained, and they voluntarily participated in the study before filling out the questionnaire.

**Consent for publication**
Not applicable.

**Competing interests**
The authors declare there is no competing interest.

## References

1. GBD 2019 Mental Disorders Collaborators. Global, regional, and national burden of 12 mental disorders in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. Lancet Psychiatry. 2022;9:137–50.
2. Kemenkes RI. Laporan Nasional Riskesdas 2018. Lemb Penerbit Badan Penelit Dan Pengemb Kesehat 2019:221–9. https://www.litbang.kemkes.go.id/laporan-riset-kesehatan-dasar-riskesdas/. Accessed 20 Jan 2022.
3. Subu MA, Wati DF, Netrida N, Priscilla V, Dias JM, Abraham MS, et al. Types of stigma experienced by patients with mental illness and mental health nurses in Indonesia: a qualitative content analysis. Int J Ment Health Syst. 2021;15:77.
4. Subu MA, Holmes D, Elliott J, Jacob JD. Persistent taboo: understanding mental illness and stigma among Indonesian adults through grounded theory. Asian J Pharm Nurs Med Sci. 2017;5:1–11.
5. Shim YR, Eaker R, Park J. Mental health education, awareness and stigma regarding mental illness among college students. J Ment Heal Clin Psychol. 2022;6:6–15.
6. Ahorsu DK, Sánchez Vidaña DI, Lipardo D, Shah PB, Cruz González P, Shende S, et al. Effect of a peer-led intervention combining mental health promotion with coping-strategy-based workshops on mental health awareness, help-seeking behavior, and wellbeing among university students in Hong Kong. Int J Ment Health Syst. 2021;15:6.
7. Hartini N, Fardana NA, Ariana AD, Wardana ND. Stigma toward people with mental health problems in Indonesia. Psychol Res Behav Manag. 2018;11:535–41.
8. Puspitasari IM, Garnisa IT, Sinuraya RK, Witriani W. Perceptions, knowledge, and attitude toward mental health disorders and their treatment among students in an Indonesian university. Psychol Res Behav Manag. 2020;13:845–54.
9. Sari SP, Yuliastuti E. Investigation of attitudes toward mental illness among nursing students in Indonesia. Int J Nurs Sci. 2018;5:414–8.
10. McLellan J, Heneghan C, Roberts N, Pluddemann A. Accuracy of self-diagnosis in conditions commonly managed in primary care: diagnostic accuracy systematic review and meta-analysis. BMJ Open. 2023;13: e065748.
11. Ahuja AS. The impact of artificial intelligence in medicine on the future role of the physician. PeerJ. 2019;7: e7702.
12. Evans-Lacko S, Little K, Meltzer H, Rose D, Rhydderch D, Henderson C, et al. Development and psychometric properties of the mental health knowledge schedule. Can J Psychiatry. 2010;55:440–8.

Ismail *et al. Egypt J Neurol Psychiatry Neurosurg*     (2023) 59:162

Page 9 of 9

13. Birkie M, Anbesaw T. Knowledge, attitude, and associated factors towards mental illness among residents of Dessie town, northeast, Ethiopia, a cross-sectional study. BMC Psychiatry. 2021;21:614.

14. Taylor SM, Dear MJ. Scaling community attitudes toward the mentally ill. Schizophr Bull. 1981;7:225–40.

15. Kihumuro RB, Kaggwa MM, Kintu TM, Nakandi RM, Muwanga DR, Muganzi DJ, et al. Knowledge, attitude and perceptions of medical students towards mental health in a university in Uganda. BMC Med Educ. 2022;22:730.

16. Maskanah I. The phenomenon of self-diagnosis in the era of the COVID-19 pandemic and its impact on mental health. JoPS J Psychol Stud. 2022;1:1–10.

17. Abi Doumit C, Haddad C, Sacre H, Salameh P, Akel M, Obeid S, et al. Knowledge, attitude and behaviors towards patients with mental illness: results from a national Lebanese study. PLoS ONE. 2019;14: e0222172.

18. Simões de Almeida R, Trigueiro MJ, Portugal P, de Sousa S, Simões-Silva V, Campos F, et al. Mental health literacy and stigma in a municipality in the North of Portugal: a cross-sectional study. Int J Environ Res Public Health. 2023;20:3318.

19. Laila NH, Mahkota R, Shivalli S, Bantas K, Krianto T. Factors associated with pasung (physical restraint and confinement) of schizophrenia patients in Bogor regency, West Java Province, Indonesia 2017. BMC Psychiatry. 2019;19:162.

**Publisher's Note**

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.