

## **Development of the Japanese version of the Depression Literacy Scale**

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1 **ABSTRACT**

2 **Background**

3 Depression is a major social concern in Japan. It is therefore necessary to develop a scale  
4 in Japanese that can assess depression literacy.

5 **Aims**

6 The present study aimed to develop the Japanese version of the Depression Literacy Scale  
7 (D-Lit-J), and examined its validity and reliability.

8 **Methods**

9 Three groups were administered the D-Lit-J, including 117 first-year university English  
10 literature students, 112 first-year medical school students, and 53 psychiatrists. Among  
11 these, 112 (95.7%), 112 (100%), and 29 subjects (54.7%) returned completed  
12 questionnaires, respectively. The total D-Lit-J scores were compared between the three  
13 groups to assess known-group validity, and internal reliability was examined by  
14 calculating Cronbach's alpha coefficients. Medical students were asked to complete the  
15 questionnaire a second time, 3 weeks later (11 students did not respond), to assess the  
16 test-retest reliability using the intra-class correlation coefficient.

17 **Results**

18 The total D-Lit-J scores (mean  $\pm$  SD) were  $7.61 \pm 4.18$ ,  $9.51 \pm 4.37$ , and  $17.7 \pm 3.15$ , for  
19 English literature students, medical students, and psychiatrists, respectively, and there  
20 were significant differences between the three groups ( $p < 0.05$ ). The Cronbach's alpha  
21 coefficients ranged from 0.800 to 0.834 in all students, and was 0.764 in psychiatrists,  
22 revealing a good internal consistency. The intra-class correlation coefficient of the scale  
23 was 0.769.

24 **Conclusions**

25 The D-Lit-J showed a credible known-group validity, with good internal and test–retest  
26 reliabilities. Additional studies with a greater variety of subjects and that examine  
27 concurrent or discriminant validity will be necessary in the future.

28

29 **Keywords:** depression literacy, measurement scale, mental health, reliability and validity

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## 33 **Development of the Japanese version of the Depression Literacy Scale**

34

### 35 **Introduction**

36 Depression is one of the most common mental disorders. Indeed, depressive disorders  
37 have been reported to be a leading cause of increases in the number of all-age years lived  
38 with disability, which is indicative of non-fatal health loss (GBD 2017 Disease and Injury  
39 Incidence and Prevalence Collaborators, 2018). An estimated 4.4% of the global  
40 population was estimated to have depression in 2015. Depression can be long-lasting and  
41 recurrent, and substantially impairs an individual's ability to function at work or at school,  
42 and to cope with daily life (World Health Organization, 2017).

43 The lifetime prevalence of major depressive disorder (as defined by the  
44 Diagnostic and Statistical Manual of Mental Disorders, fourth edition) among the  
45 Japanese population is estimated to be 5.7% (Ishikawa et al., 2018). In 2017, a nationwide  
46 survey in Japan showed that the number of patients with depression has increased 2.9-  
47 fold in 21 years (Ministry of Health, Labour and Welfare, 2017). Accordingly, the  
48 Ministry of Health, Labour and Welfare in Japan has recognized depression as a critical  
49 health issue that requires early detection and rapid treatment. For this, it is important for  
50 both health care professionals and the general public in Japan to acquire a good depression  
51 literacy.

52 Depression literacy is defined as the ability to recognize depression and make  
53 informed decisions about treatment (Deen & Bridges, 2011; Wang et al., 2007). Among  
54 the four existing scales to evaluate depression literacy (Wei et al., 2016), the Depression  
55 Literacy Scale (D-Lit) (Griffiths et al., 2004) has been used in a wide range of subjects

56 (Darraj et al., 2016; Fonseca et al., 2017; Gulliver et al., 2012; Ibrahim et al., 2019). In  
57 addition to the original English version, the D-Lit has been translated into Arabic (Darraj  
58 et al., 2016), Bengali (Arafat et al., 2017), Greek, Italian (Kiropoulos et al., 2011), Korean  
59 (Bernstein et al., 2020), and Persian (Bahrami et al., 2019). Its Cronbach's alpha  
60 coefficients have been reported to be 0.7 in athletes, with a test-retest reliability of 0.71  
61 (Gulliver et al., 2012).

62 In Japan, several researchers have used their own scales to assess depression  
63 literacy, for example, investigations into the effects of stress and depression literacy  
64 interventions on improving symptoms and knowledge of depression (Imamura et al.,  
65 2016) and assessing public beliefs in and stigma towards people with depression (Yokoya  
66 et al., 2018). Depression literacy has also been examined using a measure developed by  
67 Jorm et al. (1997); this measure has been translated into Japanese (Nakane et al., 2005),  
68 revised by the authors, and used by Japanese researchers to assess depression literacy  
69 (Kaneko & Motohashi, 2007; Kubo et al., 2018; Nakamura-Taira et al., 2018; Ojio et al.,  
70 2019; Ojio et al., 2015). However, these studies did not report the reliability or validity  
71 of this measure. It is therefore necessary to develop a valid and reliable scale in Japanese  
72 to assess depression literacy in a variety of subjects. To this aim, we developed a Japanese  
73 translation of the D-Lit (D-Lit-J) and examined its validity and reliability. Considering  
74 that medical undergraduates are more likely to obtain depression literacy than other  
75 students (Amarasuriya et al., 2015) and that the understanding of depression differs  
76 according to health training background (Hickie et al., 2007), we compared D-Lit-J scores  
77 between English literature students, medical students, and psychiatrists.

78

79 **Methods**

80 *Development of the D-Lit-J*

81 The 22-item D-Lit assesses depression literacy. Participants are asked to respond to each  
82 item with “True”, “False”, or “Don’t know”. Correct responses receive a score of 1, and  
83 incorrect or “Don’t know” responses receive a score of 0. The total score ranges from 0  
84 to 22, and higher scores indicate a higher depression literacy.

85 We developed the first D-Lit-J as follows: After receiving permission from the  
86 author of the original D-Lit (Griffiths et al., 2004), one of the authors (XX), a Japanese  
87 nursing researcher, and two English language lectures in the university translated the D-  
88 Lit into Japanese. Next, 12 researchers who specialize in public health and nursing  
89 reviewed the translations, compared them to the original English version, and made  
90 further suggestions for content and language-associated modifications. Then, the  
91 credibility of the translation was assured by back-translation by a bilingual Japanese  
92 psychiatrist. The original lead author of the D-Lit (Griffiths, K.M.) then checked the  
93 expressions used in the back-translated version that were considered difficult for Japanese  
94 people to understand, and, after discussions with her, we added supplementary  
95 explanations to the words and phrases. To assess the face validity of the translated  
96 measure, several health care professionals, non-professionals, and psychiatrists who did  
97 not know the purpose of the present study reviewed the draft, and amended it to obtain  
98 the final version of the D-Lit-J.

99 For item 17, “Counseling is as effective as cognitive behavioural therapy for  
100 depression”, the term “major depressive disorder” (“Dai-Utsu-byo” in Japanese) was used  
101 instead of “depression” (“Utsu” in Japanese), which was used in the original English

102 version. This is because the Japanese word “Utsu” encompasses various mental statuses  
103 relating to depressive mood (Ohmae, 2012), and we wished to avoid ambiguity.

#### 104 *Participants*

105 Figure 1 shows a flow diagram of the study procedure. Between December 2018 and  
106 April 2019, two groups of first-year university students majoring in English literature in  
107 Tokyo (n = 117) and in medicine in Chiba (n = 112), as well as 53 psychiatrists at four  
108 mental health clinics affiliated with university hospitals in Tokyo, Chiba, and Saitama,  
109 were asked to participate in the study. The university students were asked to complete the  
110 questionnaire during their classes, which consisted of the D-Lit-J and questions regarding  
111 their demographics. Complete questionnaires were received from 112 students majoring  
112 in English literature (95.7%) and 112 medical students (100%). The medical students  
113 were asked to complete the questionnaire a second time after 3 weeks to assess the test–  
114 retest reliability; 101 of them (90.2%) responded. The same questionnaire was mailed to  
115 53 psychiatrists, of whom 29 returned it (response rate of 54.7%). Before conducting the  
116 study, the study plan was reviewed and approved by the Ethics Committee of Juntendo  
117 University Faculty of Medicine, Tokyo, Japan (approval number 20181128, November  
118 28, 2018; and approval number 2018192, March 19, 2019).

#### 119 *Statistical analysis*

120 The total D-Lit-J scores were compared among the three groups (English literature  
121 students, medical students, and psychiatrists) to assess the known-group validity using  
122 analysis of variance. The internal reliability was examined by calculating Cronbach’s  
123 alpha coefficients within the three groups and for all students combined. The intra-class  
124 correlation coefficient (ICC) was calculated to assess the test–retest reliability within the

125 101 medical students who returned a second completed questionnaire. Data analysis was  
126 conducted using Statistical Package for Social Science version 25 (IBM, Japan Inc.,  
127 Tokyo, Japan).

128

## 129 **Results**

130 Table 1 shows the demographic characteristics of the English literature students, medical  
131 students, and psychiatrists.

132 The total D-Lit-J scores (mean  $\pm$  SD) are shown in Table 2, along with the  
133 Cronbach's alpha coefficient for each group. The scores were significantly different  
134 between the three groups, increasing in the order of English literature students, medical  
135 students, and psychiatrists (Figure 2), which indicated that the D-Lit-J had a good known-  
136 group validity. The Cronbach's alpha coefficients of the D-Lit-J were 0.800-0.842 in the  
137 combined student groups and 0.764 in the psychiatrist group, which indicated a good  
138 internal reliability of the scale (Table 2). The scores of the two questionnaires completed  
139 by the 101 medical students were significantly correlated, with an ICC of 0.769, which  
140 indicated a good test-retest reliability (Figure 3).

141 Table 3 shows the actual wording of the 22 items of D-Lit-J, along with the  
142 correct response rates in each group. The percentage of correct answers ranged from 4.5%  
143 to 75.9% in English literature students, 0.9% to 84.8% in medical students, and 20.7% to  
144 100% in psychiatrists. Among all students, an especially low correct response rate was  
145 seen for item 17 ("Counseling is as effective as cognitive behavioural therapy for  
146 depression") and item 21 ("Antidepressants are addictive"). In psychiatrists, the correct  
147



148 response rate for item 17 was 20.7%, which was the lowest correct response rate of all 22  
149 items within this group.

150

## 151 **Discussion**

152 The D-Lit is a widely used instrument that assesses depression literacy. We translated the  
153 D-Lit into Japanese and investigated its validity and reliability in university students and  
154 psychiatrists. The known-group validity test showed that the D-Lit-J was able to  
155 recognize those who are expected to have a greater knowledge of depression, i.e.,  
156 psychiatrists. The scores were significantly different between English literature students  
157 and medical students. Similarly, the depression literacy of medical students was higher  
158 than that of those in other disciplines (Amarasuriya et al., 2015).

159 The Cronbach's alpha coefficients demonstrated a good internal consistency in  
160 the present study (0.764–0.842), which supports previous findings from Bahrami et al.  
161 (2019), Darraj et al. (2016), and Gulliver et al. (2012). Thus, the D-Lit-J, as with versions  
162 in other languages, seems to have an acceptable internal consistency. In addition, the ICC  
163 was 0.769 in the present study, which indicates a good test–retest reliability (Koo & Li,  
164 2016).

165 The correct response rates to item 17 (“Counselling is as effective as cognitive  
166 behavioural therapy for depression”) and item 21 (“Antidepressants are addictive”) were  
167 below 10% among all students. Low correct response rates to these two items have also  
168 been observed in previous studies. For example, Fonseca et al. (2017) reported correct  
169 response rates of 10.3% and 10.8% for items 17 and 21, respectively, in women during  
170 the perinatal period in Portugal. The correct response rate for item 17 was 13.8% in

171 Iranian female high school students (Bahrami et al., 2019). These two items contain  
172 terminology that is specific to the field of psychiatry, which could mean that they are  
173 more difficult for non-experts to understand and, thus, correctly respond to.

174         The psychiatrists also had a low correct response rate for item 17, despite our  
175 choice to use the more specific term “major depressive disorder” (Dai-utsu-byo) in the  
176 place of “depression” (Utsu). This result could indicate that psychiatrists in Japan  
177 consider counseling to be as effective as cognitive behavioral therapy for depression;  
178 indeed, authors such as Barth et al. (2013) have reported that both these measures can  
179 effectively reduce depressive symptoms. Despite the low rate of the correctness of item  
180 17 in psychiatrists in Japan, this item is retained in D-Lit-J, because D-Lit including item  
181 17 is used in various samples around the world, and the international comparison becomes  
182 possible by using D-Lit-J including item 17 as a universal item. When interpreting the  
183 results of D-Lit-J, however, it is necessary to consider the existence of this item.

184         The present study demonstrated that the D-Lit-J is a reliable and valid tool to  
185 assess knowledge of depression; it could therefore serve as an instrument to evaluate the  
186 efficacy of intervention programs to promote depression literacy. This study has several  
187 limitations, however. First, participants were limited to university students and  
188 psychiatrists from the Tokyo metropolitan area of Japan. Therefore, the generalizability  
189 of our findings to the rest of Japan is unclear. Further studies will be needed to conduct  
190 the study in the general population with different educational backgrounds throughout the  
191 Japanese population. Second, English literature students in this study were all females,  
192 whereas medical students and psychiatrists consisted of both males and females. Since  
193 the prevalence of depression differs according to gender and age (Ghadirian & Sayarifard,

194 2019; Kheirabadi et al., 2021), it should be investigated whether there is any variation of  
195 depression literacy with gender and age of the respondents in a further study. Third, the  
196 validity was examined only for the known group; therefore, other types of validity, such  
197 as concurrent validity and discriminant validity, should also be studied.

198

### 199 **Conclusions**

200 The D-Lit-J showed a credible known-group validity with good internal and test–retest  
201 reliabilities. Additional studies with participants that have different educational  
202 backgrounds throughout the Japanese population and examinations of concurrent or  
203 discriminant validity will be necessary.

204

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210

### 211 **Conflict of Interest**

212 The authors declare that they have no conflict of interest.

213

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## Figure legends

**Figure 1.** The study procedure.

**Figure 2.** Comparison of D-Lit-J scores among the three groups. ● = mean. Bar = standard deviation.

\* $p < 0.01$ , \*\* $p < 0.001$

**Figure 3.** Relationship of the D-Lit-J total scores between the 1st and 2nd sessions in the 101 medical students

$r$  = Pearson's correlation coefficient; ICC = intra-class correlation coefficient

**Table 1.** Characteristics of the three groups of respondents

	112 English literature students	112 medical students	29 psychiatrists
Gender			
Male <sup>a</sup>	0 (0.0)	92 (82.1)	25 (86.2)
Female <sup>a</sup>	112 (100)	20 (17.9)	4 (13.8)
Age [years] <sup>b</sup>	18.3 (0.57)	19.3 (0.82)	40.2 (11.2)
Years of practice as a psychiatrist <sup>a</sup>			
≤5			13 (44.8)
6-10			4 (13.8)
11-15			2 (6.9)
16-20			3 (10.4)
≥21			7 (24.1)

<sup>a</sup> Number (%)<sup>b</sup> Mean (Standard deviation)

**Table 2.** D-Lit-J scores in English literature students, medical students, and psychiatrists

	n	Mean (SD)	Range	Cronbach's alpha
English literature students	112	7.61 (4.18)	0 -15	0.800
Medical students				
1st session	112	9.51 (4.37)	0 -18	0.821
2nd session	101	8.76 (4.53)	0 -18	0.842
Students combined	224	8.56 (4.37)	0 -18	0.818
Psychiatrists		17.7 (3.15)	9 -22	0.764

SD = standard deviation

**Table 3.** Number and percentage of participants who correctly answered D-Lit-J items

Item (Correct answer)	English literature students	Medical students	Psychiatrists
1. People with depression often speak in a rambling and disjointed way. (False)	13 (11.6)	23 (20.5)	19 (65.5)
2. People with depression may feel guilty when they are not at fault. (True)	83(74.1)	95 (84.8)	29 (100)
3. Reckless and foolhardy behaviour is a common sign of depression. (False)	29 (25.9)	43 (38.4)	20 (69.0)
4. Loss of confidence and poor self-esteem may be a symptom of depression. (True)	85(75.9)	90 (80.4)	28 (96.6)
5. Not stepping on cracks in the footpath may be a sign of depression. (False)	36 (32.1)	30 (26.8)	20 (69.0)
6. People with depression often hear voices that are not there. (False)	13 (11.6)	13 (11.6)	15 (51.7)
7. Sleeping too much or too little may be a sign of depression. (True)	64 (57.1)	84 (75.0)	27 (93.1)
8. Eating too much or losing interest in food may be a sign of depression. (True)	56 (50.0)	79 (70.5)	28 (96.6)
9. Depression does not affect your memory and concentration. (False)	56 (50.0)	69 (61.6)	28 (96.6)
10. Having several distinct personalities may be a sign of depression. (False)	26 (23.2)	22 (19.6)	23 (79.3)
11. People may move more slowly or become agitated as a result of their depression. (True)	62 (55.4)	78 (69.6)	29 (100)
12. Clinical psychologists can prescribe antidepressants. (False)	17 (15.2)	42 (37.5)	29 (100)
13. Moderate depression disrupts a person's life as much as multiple sclerosis or deafness. (True)	41 (36.6)	50 (44.6)	23 (79.3)
14. Most people with depression need to be hospitalized. (False)	47 (42.0)	60 (53.6)	29 (100)
15. Many famous people have suffered from depression. (True)	55 (49.1)	78 (69.6)	19 (65.5)
16. Many treatments for depression are more effective than antidepressants. (False)	18 (16.1)	24 (21.4)	17 (58.6)
17. Counselling is as effective as cognitive behavioural therapy for depression. (False)	7 (6.3)	1 (0.9)	6 (20.7)
18. Cognitive behavioural therapy is as effective as antidepressants for mild to moderate depression. (True)	27 (24.1)	38 (33.9)	23 (79.3)
19. Of all the alternative and lifestyle treatments for depression, vitamins are likely to be the most helpful. (False)	25 (22.3)	34 (30.4)	19 (65.5)
20. People with depression should stop taking antidepressants as soon as they feel better. (False)	37 (33.0)	44 (39.3)	28 (96.6)
21. Antidepressants are addictive. (False)	5 (4.5)	10 (8.9)	25 (86.2)
22. Antidepressant medications usually work straight away. (False)	50 (44.6)	58 (51.8)	28 (96.6)

Figure 1.

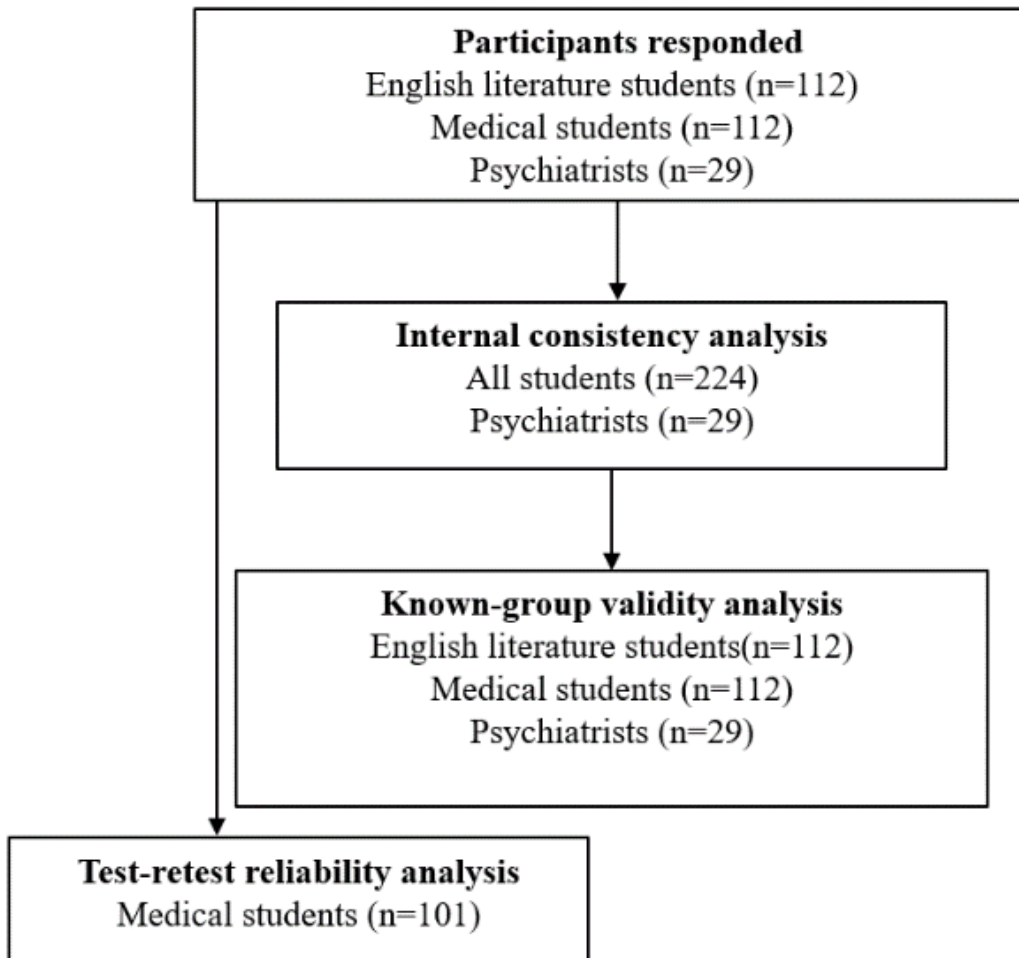


Figure 2.

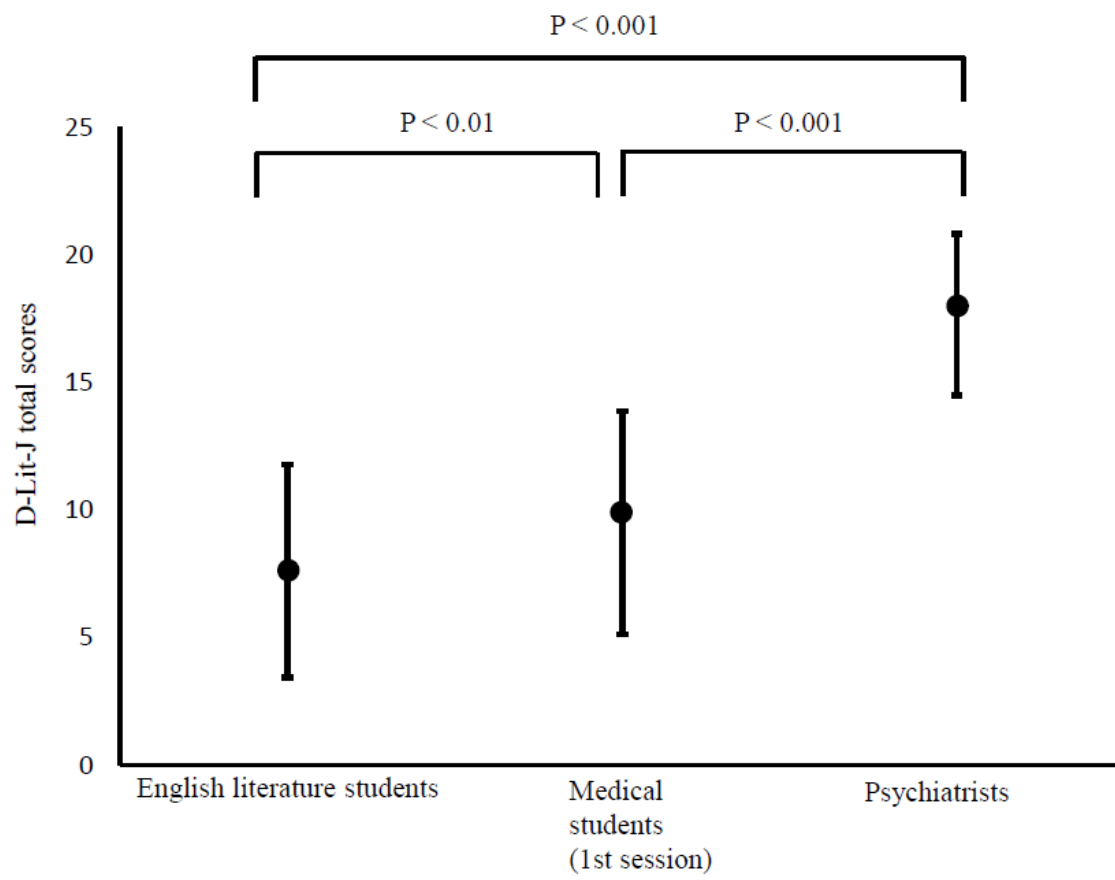


Figure 3.

