Original article

Longitudinal Relationships Between Help-Seeking Intentions and Depressive Symptoms in Adolescents

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A B S T R A C T

Purpose: Cross-sectional studies have shown an association between lower help-seeking intentions and greater depressive symptoms among adolescents. However, no longitudinal study has examined the direction of this association. The current study investigated whether help-seeking intentions and depressive symptoms are reciprocally associated at the within-person (individual) level during early to mid-adolescence.
Methods: Longitudinal data on help-seeking intentions and depressive symptoms in adolescents were obtained from a population-based birth cohort study (Tokyo Teen Cohort; N = 3,171) at four time points (10y, 12y, 14y, and 16y). A random intercept cross-lagged panel model was used to evaluate the within-person prospective associations between help-seeking intentions and depressive symptoms.
Results: At the within-person level, significant associations were consistently observed between antecedent greater depressive symptoms and subsequent lower help-seeking intentions across all time points (10y–12y: standardized regression coefficient (β) = −0.12, p < .001; 12y–14y: β = −0.07, p < .05; and 14y–16y: β = −0.09, p < .01). Meanwhile, significant within-person associations were partly observed between antecedent lower help-seeking intentions and subsequent greater depressive symptoms from 10y to 12y (β = −0.07, p < .05) and from 14y to 16y (β = −0.12, p < .001). These prospective associations were almost the same when adjusted for the number of potential confidants as a time-varying confounder.

IMPLICATIONS AND CONTRIBUTION

Adolescents with worsening depressive symptoms become increasingly reluctant to seek help. Proactive early recognition and interventions should be promoted for parents, teachers, and other individuals around adolescents with depressive symptoms.

Discussion: Adolescents with worsening depressive symptoms may become increasingly reluctant to seek help over time. Proactive early recognition and intervention with support from parents, teachers, and other individuals may facilitate the management of depression in adolescents.

Depressive symptoms are one of the core components of clinical diagnosis for major depressive disorder, which is prevalent during adolescence [1]. However, the majority of adolescents with depression do not use mental health services [2], which may lead to more complex, longer-lasting mental health symptoms (e.g., anxiety and suicidality) [3] as well as negative psychosocial experiences (e.g., academic failure and unemployment) in adulthood [4]. Hence, early interventions are crucial to connect vulnerable adolescents with appropriate services.

Help-seeking behaviors for mental health symptoms refer to the adaptive coping process that attempts to obtain external assistance, including formal (e.g., mental health services) and informal (e.g., family and friends) sources, to address mental health symptoms [5], and these behaviors have been shown to be predicted by help-seeking intentions (i.e., intentions to actually perform these behaviors) [6,7]. A recent systematic review of adolescent studies reported cross-sectional associations between lower help-seeking intentions and greater mental health symptoms, such as suicidal ideation [8]. This may be true of depressive symptoms more broadly, and previous cross-sectional adolescent studies observed that help-seeking intentions were negatively associated with depressive symptoms [9,10]. These studies suggested that greater depressive symptoms may lead to lower help-seeking intentions [9,10]; adolescents with depressive symptoms may be unwilling to access care, and therefore, proactive recognition and intervention may be required from individuals around them [9,10]. As a converse direction in this association, it is also feasible that lower help-seeking intentions may lead to greater depressive symptoms, a situation where interventions for improving adolescents' help-seeking intentions may be required. Thus, understanding the directionality of this association will help develop effective prevention of depression in adolescents.

However, no longitudinal study has examined the directionality between help-seeking intentions and depressive symptoms; this is the first study which aims to examine the directionality. As the main object of interest is within-person (individual) level directionality, a within-person analysis (i.e., random intercept cross-lagged panel model [RI-CLPM] [11]) was conducted. As opposed to the traditional cross-lagged panel model, the RI-CLPM can separate "within-person change over time" from "stable between-person (time-invariant) differences." The RI-CLPM is, therefore, considered to be able to sufficiently control for the full range of between-person (time-invariant) confounders (from known possible factors, such as sex and dwelling environments [8,12], to unknown factors), even when those factors are not specified in the model. The ability of RI-CLPM can lead to clearer estimates of the within-person prospective associations which are critical for understanding relationships with help-seeking behaviors among adolescents with depression.

Methods

Study design, participants, and procedure

Data obtained from a population-based birth cohort study (Tokyo Teen Cohort [TTC]) (http://ttcp.umin.jp/) were used [13]. The TTC aimed to examine adolescents' health and development. The participants included children born between September 1, 2002, and August 31, 2004. They were randomly selected using the Basic Resident Register of the Tokyo metropolitan area (Setagaya, Mitaka, and Chofu). Invitation letters were sent to the parents of the children around their 10th birthday. Data were collected at four time points when participants were aged 10 (baseline: T1), 12 (second wave: T2), 14 (third wave: T3), and 16 (fourth wave: T4) years. A total of 3,171 child-parent pairs participated at T1; of these, 3,007 pairs participated at T2 (follow-up rate: 94.8%), 2,667 participated at T3 (follow-up rate: 84.1%), and 2,616 participated at T4 (follow-up rate: 82.5%). A trained interviewer administered self-report questionnaires to both children and parents at their homes and conducted semi-structured interviews with the parents. The survey was completed over two visits in each wave.

The TTC study protocol was approved by the ethics committees of the Tokyo Metropolitan Institute of Medical Science (#12–35), the University of Tokyo (#10057), and SOKENDAI (the Graduate University for Advanced Studies; #2012002). Written informed consent was obtained from parents prior to participation.

Measurements

Help-seeking intentions for depression. We developed a vignette describing a boy with depressive symptoms, which was used in our previous study [9]. We called the boy Taro, which is one of the most popular names for boys in Japan. The description of the vignette was as follows: "For the last several weeks, Taro has been feeling unusually sad. He is tired all the time and has trouble sleeping at night. Taro does not feel like eating and has lost weight. He cannot keep his mind on his studies, and his grades have dropped. He puts off making any decisions, and even day-to-day tasks, such as studying and extracurricular activities, seem too much for him. His parents and teachers are very concerned about him." The vignette met the diagnostic criteria for major depression according to the DSM-IV and ICD-10. This type of vignette has been used in previous studies to assess beliefs about the benefits of help-seeking [14–16]. After reading the vignette, the participants, at each wave, were asked to determine whether they would seek help from others if they were in the same situation as the boy (Taro) in the vignette ("help-seeking intentions"). The response options for this question were as follows: "I would consult someone immediately (scored as 1)" and "I would wait and see without consulting anyone (scored as 0)."

In addition, participants were asked about the number of potential confidants (0, 1, 2, 3, 4, 5, or more) if they were in Taro's situation ("number of potential confidants").

Depressive symptoms. Adolescents' depressive symptoms were assessed at each wave using the Short Mood and Feelings Questionnaire, which includes 13 self-report questions rated on a 3-point Likert scale (total score: 0−26) [17]. The reliability and validity of the Short Mood and Feelings Questionnaire were confirmed to have high internal consistency and a positive correlation with the Diagnostic Interview Schedule for Children diagnosis of depression [17].

Statistical analysis

To examine within-person prospective associations between help-seeking intentions and depressive symptoms in adolescents, we used the RI-CLPM as a within-person analysis [11]. Figure 1 shows a path diagram of full specification of the RI-CLPM. RI-CLPM can examine autoregressive and bidirectional lagged effects between two constructs at the within-person level by dividing observed data of each construct into two latent variables, that is, "within-person change over time" ("within-person component") and "stable (time-invariant) between-person differences" ("between-person component"), through the following

two procedures for each construct of interest: (1) the observed variables were regressed (with regression weights constrained to 1) on a single time-invariant latent factor ("random intercept") which represents stable effects on these observed variables across all time points surveyed ("between-person component"), and (2) the observed variables were also regressed (with the same weights) on a separate latent factor for each time point which represents a time-specific deviation from the participants' own average of these variables ("within-person component"). Then, cross-lagged and autoregressive parameters between these latent factors ("within-person component") were estimated without weights. With this separation of the "within-person component" from the "between-person component," RI-CLPM is considered to be able to sufficiently control for a full range of time-invariant between-person confounders (from known possible factors, such as sex and dwelling environments [8,12], to unknown factors), even when those confounders are not specified in the model. The within-person autoregressive paths show a stability of deviation from the participants' own average in each construct, and within-person cross-lagged paths show the effects of deviation from the participants' own average in one construct on subsequent deviation from the participants' own average in the other construct. Additionally, the covariance between "random intercepts" of the two constructs shows an association between overall "stable (time-invariant) between-
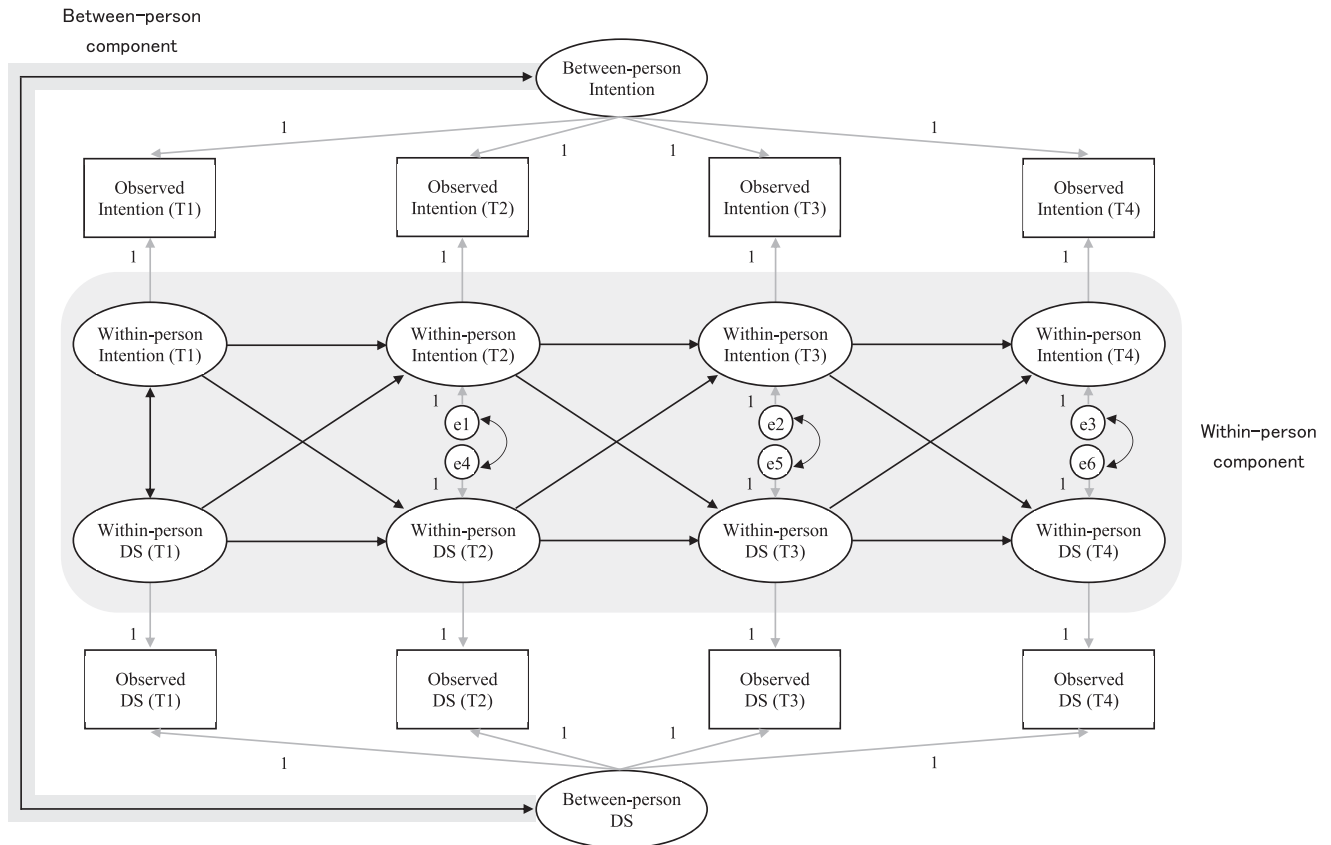

Figure 1. Full specification of random intercept cross-lagged panel model analyzing longitudinal associations between intentions to seek help from others and depressive symptoms in adolescents. Note: squares represent observed variables, and circles represent latent variables. DS: depressive symptoms; Intention: intentions to seek help from others; e1−e6: errors; T1: age 10; T2: age 12; T3: age 14; T4: age 16.

person differences" across all time points surveyed for each construct ("between-person component").

Regarding time-varying confounders, RI-CLPM can control for these confounders by including them in the model in the same way as the initial two constructs of interest [18]. As a main analysis, we examined within-person prospective associations between help-seeking intentions and depressive symptoms (unadjusted model) and additionally controlled for the number of potential confidants as a time-varying confounder in these associations (adjusted model); this may be highly associated with help-seeking intentions [9] as well as depressive symptoms [19].

We reported standardized regression coefficients as effect sizes and used benchmark values of 0.03 (small effect), 0.07 (medium effect), and 0.12 (large effect) for cross-lagged effects, according to a recent effect size guideline for RI-CLPM [20]; cross-lagged effects are much lower than concurrent correlation coefficients, as autoregressive effects account for a large portion of variance in variables due to stabilities in the variables [21].

Full information maximum likelihood estimation with an MLR estimator was employed to handle missing data [22] under the assumption of missing at random. To test this assumption, we examined whether there was a significant difference in help-seeking intentions, the number of potential confidants, and depressive symptoms at antecedent time points between participants with and without missing data in each of these variables at subsequent time points (i.e., T4 vs. T3, T3 vs. T2, and T2 vs. T1), using the chi-square test for help-seeking intentions and the t-test for the number of potential confidants and depressive symptoms. We also examined whether there was a significant difference between participants with and without missing data in each variable above at each time point (i.e., T1–T4), in sex and age at T1, using the chi-square test for sex and the t-test for age. The RI-CLPM was conducted using Mplus version 8.4 [23], and the chi-square test and t-test were conducted using R version 4.2.3. The significance level was set at $\alpha = 0.05$. Mplus code for the RI-CLPM is shown in Appendix file 1.

Results

Table 1 shows the variables of interest in participants (i.e., help-seeking intentions, the number of potential confidants, and depressive symptoms) at each time point. There seems to be a decreasing trend in help-seeking intentions across time points surveyed. From the total sample (N = 3,171), participants with missing data in all variables used in each analysis were removed; samples of N = 3,163 and 3,164 were used for unadjusted and adjusted models of RI-CLPM, respectively. There was no significant difference in each variable of interest at antecedent time points between participants with and without missing data in the variable at subsequent time points (i.e., T4 vs. T3, T3 vs. T2, and T2 vs. T1). There was also no significant difference in sex and age at T1 between participants with and without missing data in each variable of interest at each time point (i.e., T1–T4), except for depressive symptoms at T4. The significant difference in age at T1 is 0.3 months between participants with and without missing data in depressive symptoms at T4.

Figure 2 shows the results of the RI-CLPM of help-seeking intentions and depressive symptoms (unadjusted model). The fit of the model was acceptable (RMSEA = 0.029 [90% confidence interval: 0.019–0.040], CFI = 0.987, SRMR = 0.019). At the within-person level, significant longitudinal associations were consistently observed between antecedent greater depressive symptom severity and lower subsequent help-seeking intentions across all time points (from T1 to T2: standardized regression coefficient (β) = −0.12, $p < .001$ (large effect); from T2 to T3: β = −0.07, $p < .05$ (medium effect); from T3 to T4: β = −0.09, $p < .01$ (medium effect)). On the other hand, significant within-person level longitudinal associations were partly observed between antecedent lower help-seeking intentions and subsequent greater depressive symptoms, from T1 to T2 (β = −0.07, $p < .05$ (medium effect)) and from T3 to T4 (β = −0.12, $p < .001$ (large effect)) only.

Figure A1 shows the results of the RI-CLPM regarding help-seeking intentions and depressive symptoms with adjustment for the number of potential confidants (adjusted model). The longitudinal within-person associations between help-seeking intentions and depressive symptoms were almost the same as the unadjusted model. Additionally, significant within-person level longitudinal associations were partly observed between antecedent lower help-seeking intentions and subsequent lower number of potential confidants, from T1 to T2 (β = 0.09, $p < .01$ (medium effect)) and from T3 to T4 (β = 0.12, $p < .001$ (large effect)).

Discussion

This is the first study to use the RI-CLPM to examine the within-person prospective association between help-seeking intentions and depressive symptoms in a general population cohort of adolescents. The results of the RI-CLPM showed consistent within-person prospective associations between antecedent greater depressive symptoms and subsequently reduced help-seeking intentions across early to mid-adolescence, with medium to large effects. These significant associations were almost the same with adjustment for the number of potential confidants. On the other hand, antecedent lower help-seeking intentions were less consistently associated with a subsequent increase in depressive symptoms at the within-person level, although two medium effects were
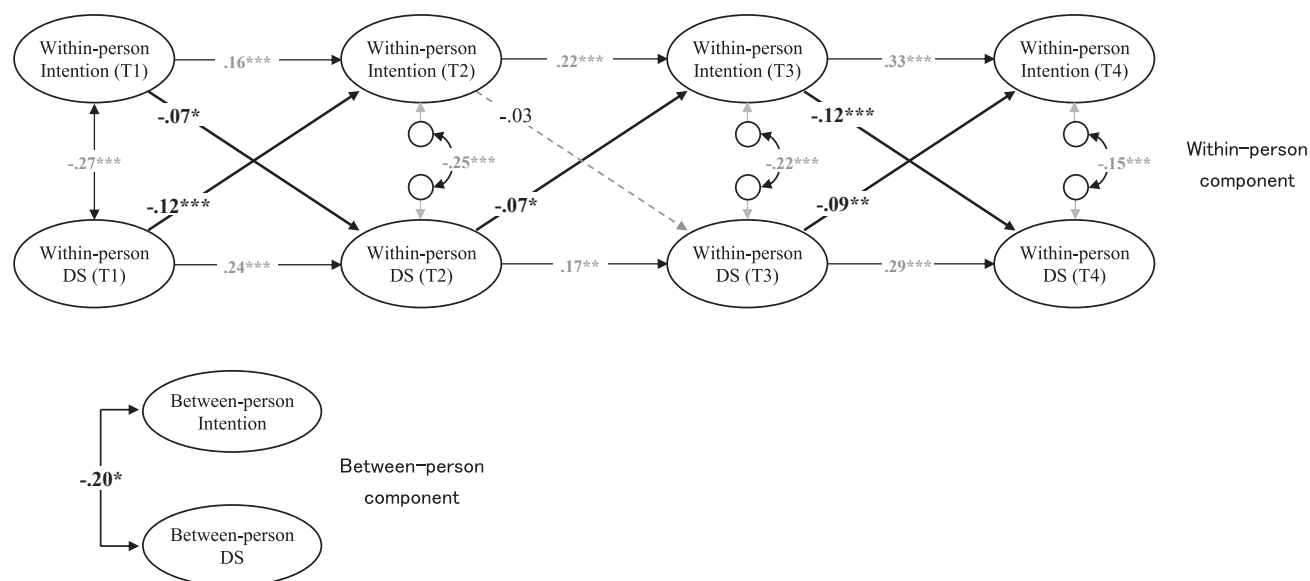
Table 1
Help-seeking intentions, number of potential confidants, and depressive symptoms at all surveyed time points

N = 3,171 (boys: N = 1,684 (53.1%))	T1	T2	T3	T4
Help-seeking intentions[a]				
Yes: N (%)	2,428 (77.8%)	1,830 (72.4%)	1,308 (63.6%)	1,231 (63.1%)
Number of potential confidants[b]				
0: N (%)	54 (1.7%)	50 (2.0%)	50 (2.4%)	75 (3.8%)
1:	287 (9.2%)	163 (6.4%)	117 (5.7%)	117 (6.0%)
2:	484 (15.5%)	339 (13.4%)	303 (14.8%)	306 (15.7%)
3:	441 (14.1%)	330 (13.0%)	313 (15.3%)	341 (17.5%)
4:	266 (8.5%)	191 (7.5%)	153 (7.5%)	174 (8.9%)
5 or more	1,586 (50.9%)	1,457 (57.6%)	1,115 (54.4%)	937 (48.1%)
SMFQ score[c]				
Mean (SD)	4.8 (4.6)	3.8 (4.5)	3.1 (4.6)	3.7 (5.2)

SMFQ = short mood and feelings questionnaire; T1 = age 10; T2 = age 12; T3 = age 14; T4 = age 16.
  [a] Valid N = 3,119 at T1; 2,527 at T2; 2,056 at T3; 1,951 at T4.
  [b] Valid N = 3,118 at T1; 2,530 at T2; 2,051 at T3; 1,950 at T4.
  [c] Valid N = 2,966 at T1; 2,479 at T2; 2,026 at T3; 1,920 at T4.

Figure 2. Random intercept cross-lagged panel model analyzing longitudinal associations between intentions to seek help from others and depressive symptoms in adolescents separated into within-person and between-person components. Standardized estimates are shown (*p < .05, **p < .01, ***p < .001); solid arrows represent significant regression coefficients (single-headed) or correlations (double-headed); significant effects are highlighted in bold. DS: depressive symptoms; Intention: intentions to seek help from others; T1: age 10; T2: age 12; T3: age 14; T4: age 16. Model fit indices: RMSEA = 0.029 (90% confidence interval: 0.019–0.040), CFI = 0.987, SRMR = 0.019.

observed, even with adjustment for the number of potential confidants. We note that a decreasing trend observed in help-seeking intentions among overall samples across time points surveyed did not affect the interpretation of the results because RI-CLPM accounted for the group-level (overall participants) trajectory of each construct when separating "within-person component" from "between-person component" [18].

Adolescents with worsening depressive symptoms are considered to become increasingly reluctant to seek help, with medium to large effect sizes, highlighting the need for caregivers and individuals working with adolescents to be able to recognize the first signs of these mental health symptoms and proactively facilitate access to care. To improve early detection, a number of psychoeducational interventions have been conducted for parents and teachers, as they are especially connected to adolescents' daily lives [24,25]. However, the effectiveness of these interventions has not been established [24,25]. In addition, using screening tools might be effective in improving adolescents' access to appropriate services [26]; however, commonly used depression screening tools may not be able to sufficiently identify adolescents with depression [27]. Future studies are needed to develop effective interventions for recognizing adolescents with depressive symptoms.

On the other hand, lower antecedent help-seeking intentions were partly associated with subsequent greater depressive symptoms at the within-person level, with medium effect sizes. This suggests that interventions to improve adolescents' help-seeking intentions may also be an effective way to prevent depression in adolescents. Thus far, a number of studies have observed positive impacts of intervention programs on help-seeking intentions in adolescents [28], although few studies have observed improvements in actual help-seeking behaviors [28]. Considering that depressive symptoms may interfere with help-seeking intentions, future intervention programs may need

to include messages that encourage adolescents to seek help when they are experiencing the early stages of mental health symptoms. Also, to create environments in which such early help-seeking occurs easily, additional interventions may be needed for individuals around adolescents.

Within the time intervals of the TTC survey (2 years each), there could be potential mechanisms for the associations between antecedent greater depressive symptoms and subsequent lower help-seeking intentions. Adolescents with greater depressive symptoms may have more difficulties in help-seeking due to the symptoms [29]. Even when adolescents with depressive symptoms seek help, they may not receive useful help. In this situation, their motives for help-seeking are considered to decrease, which may be followed by decreases in their intentions to seek help [29]. The converse direction may also be feasible (i.e., getting useful help may improve their depressive symptoms as well as their intentions to seek help). In fact, recent systematic reviews reported that previous experiences of help-seeking affect adolescents' help-seeking intentions in the same directions as these experiences (positive or negative) [8,30]. It may be crucial for people around adolescents experiencing mental health symptoms to listen to their concerns sincerely when approached [30].

Previous cross-sectional studies consistently observed that more serious mental health symptoms were associated with higher preferences for not seeking help from anyone [9,10,31–33]. Findings of the current study add evidence regarding the directionality in this association. However, these associations may be different across sources of help (e.g., family, friends, and school counselors) [10,31–34], and, in particular, greater depressive symptoms might be associated with higher help-seeking intentions from online sources [10]. Future studies using RI-CLPM to examine directionality in these associations across each source of help may be useful in developing broader prevention strategies

for adolescent depression. Beyond this, even when adolescents can seek help, the probability of accessing mental health services can vary depending on the source of help; adolescents may still rely on adults, particularly their parents, to facilitate access to appropriate help [35]. Furthermore, considering that adolescents may receive mental health services through more familiar professionals, such as general practitioners and school counselors [35], it may be more difficult for Japanese adolescents to receive services as the Japanese system does not have general practitioners [36], and there are few full-time school counselors (almost all of them are part-time workers [37]).

The strength of our study is the first application of RI-CLPM to examine the within-person prospective associations between help-seeking intentions and depressive symptoms in a general population of adolescents from the TTC study with a high follow-up rate (82.5% at T4). Sufficient control for a full range of time-invariant between-person confounders (from known possible factors such as sex and dwelling environments [8,12] to unknown factors) with relatively lower attrition bias enables us to obtain clearer estimates of the within-person prospective association, which can lead to better understanding of longitudinal relationships between help-seeking intentions and depressive symptoms. We note that, since participants of the current study were originally living in Tokyo metropolitan area and few of them moved to other areas, the longitudinal relationships observed in the current study might differ from adolescents living in other countries and/or rural areas [12,38].

The current study has several limitations. First, we controlled for only one time-varying confounder (the number of potential confidants). The prospective associations between help-seeking intentions and depressive symptoms might be weakened when other possible time-varying confounders are controlled for. Possible time-varying confounders include knowledge/recognition of mental health symptoms/illnesses, knowledge about sources of help (where/who to talk to), attitudes/stigma toward mental health/illnesses (perceiving help-seeking as a sign of weakness, perceived negative public attitudes toward mental illnesses) [8,30]. These factors are, however, considered to be relatively stable and can be controlled for using RI-CLPM, considering that nationwide education about mental health/illnesses has not been conducted in Japan for over 40 years, only being added to the high school curriculum in 2022 [39]. We also note that there could be moderators, although scarce evidence for the moderation has been reported (i.e., only one study that addressed stigma against mental health symptoms [34]). Second, there was a significant difference in age at T1 between participants with and without missing data in depressive symptoms at T4. However, the significant difference was very small (0.3 months) and might not lead to much bias in the results. Third, the data used in the current study were obtained from self-report questionnaires, which may have led to an underestimation of depressive symptoms [40]. Also, the vignette used in this study has not been validated, although it was developed to meet the diagnostic criteria for major depression according to the DSM-IV and ICD-10. Moreover, the person (Taro) in the vignette was a boy, and help-seeking intentions might differ when the person was a girl [12]. Fourth, we investigated depressive symptoms in a nonclinical sample using a self-report questionnaire. Caution should be required when generalizing the results to people diagnosed with clinical depression. Finally, the surveys were conducted at ages 10–16 years (early and mid-adolescence); therefore, we cannot generalize the results of the current study to later adolescence. Future studies applying a within-person analysis need to be conducted, including longitudinal data from late adolescence.

Conclusions

At the individual level, adolescents with greater depressive symptoms can be expected to become more reluctant to seek help, and this prospective association is consistent from early to mid-adolescence. For adolescents with depressive symptoms, proactive recognition and intervention for their mental health symptoms are required from individuals around these adolescents. On the other hand, significant individual levels of prospective associations were partly observed between antecedent higher help-seeking intentions and subsequent decrease in depressive symptoms. Preventive interventions for improving help-seeking intentions in adolescents may be effective, with messages encouraging them to seek help at an early stage of mental health symptoms.

Supplementary Data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jadohealth.2023.06.033.

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