Psychopathology among Emerging Adults with Learning Disabilities in Canada

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Abstract: Individuals with learning disabilities (LDs) are more likely to have a mental illness, yet few studies explore this association in emerging adulthood, a developmental period with an increased risk for mental illness. The purpose of the current study was to investigate psychological distress in emerging adults (15–29 years) with and without LDs. The 2012 Canadian Community Health Survey—Mental Health was used (n = 5630), and multiple and logistic regression models with survey weights were computed. Adjusting for demographic, psychosocial, and health covariates, there was no evidence for significant differences in psychological distress among emerging adults with vs. without LDs. However, age and sex were significant effect modifiers. Among emerging adults with LDs, both males (OR = 2.39 [1.01, 5.67]) and those aged 25–29 years (OR = 3.87 [1.05, 14.30]) had an increased odds of clinically relevant psychological distress in comparison to those without LDs. These findings suggest a need for improved awareness and support for prevention of psychological distress among emerging adults with LDs, especially for males and those in later emerging adulthood.

Keywords: learning disability; psychological distress; mental health; emerging adulthood; Canadian Community Health Survey; attention-deficit/hyperactivity disorder; epidemiology

1. Introduction

Learning disabilities (LDs) are a type of invisible disability currently defined in the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5) as “difficulties in learning and using academic skills that have persisted for at least six months regardless of appropriate interventions” and are not related to other conditions, such as sensory deficits or intellectual disabilities [1]. Decades of research using the North American characterization of LDs assert that they are caused by central nervous system dysfunction that implicates genetics, sex, and pre- and post-natal damage [2,3]. LDs occur in people of all ethnicities and socioeconomic statuses, and they are present throughout life [2,4,5].

An association between LDs and poor mental health has been found, including increased stress, substance use disorders, anxiety, depression, and suicidal thoughts [6–8]. Research has shown that the association can be attributed to both genetic and environmental factors [9]. Indeed, the association between LDs and mental illness varies across sex, age, and the presence of comorbidities. There is evidence to suggest that symptoms of mental illness manifest differently among child, adolescent, and adult males and females with LDs, with females displaying more internalizing symptoms and disorders (i.e., symptoms of anxiety and depression), and males exhibiting more externalizing symptoms (i.e., attention-deficit/hyperactivity disorder (ADHD)) [6,10]. Sex-based differences may be associated with divergent sources of stress and coping mechanisms, such as emotional and avoidance-based coping in females compared with task-based coping in males [11]. Further, symptoms of mental illness in adolescents and adults with LDs have been shown to increase with age [6], though the contrary was found in a meta-analysis that focused only on internalizing problems in adults [12]. The mental health of children and adolescents with LDs may be...
linked to whether they have co-occurring LDs or other types of mental illness [9,13,14]. Importantly, LDs are often comorbid with ADHD [5,14], though the effect of ADHD in the association between LDs and mental illness is inconsistent [15]. Comorbid LDs/ADHD have resulted in poorer mental health outcomes when compared with those with LDs alone [6,16]; yet, psychosocial factors, such as engagement in school/extracurricular activities, were partial mediators in the association between LDs/ADHD and risk-taking activities [17].

Considering that most studies investigating mental health in individuals with LDs have focused on children and adolescents, the purpose of this investigation was to explore the association between LDs and mental illness in emerging adults (18–29 year-olds). Emerging adulthood is a recently defined developmental period that addresses the delayed entrance into adulthood as a result of modern societal changes [18]. It is independently associated with increased substance use experimentation and mental illness compared with adolescence [19,20]. There are implications for later-life mental health concerns as those with LDs are faced with lower postsecondary educational attainment, higher unemployment, the loss of their support system, and a higher likelihood of receiving sickness allowance or disability pensions and reimbursement for psychoactive medication expenses [21,22]. Thus, further research into the mental health of emerging adults with LDs is essential to inform prevention across the lifespan.

The aims of this study were to investigate psychological distress in emerging adults with LDs and to examine potential effect modification by age, sex, ADHD, and impairment. Psychological distress was used as the outcome because it detects symptoms of mental illness. Such measurement is relevant given that evidence suggests many individuals with LDs experience the burden of subclinical mental illness [23]. Compared with emerging adults without LDs, it was hypothesized that (1) emerging adults with LDs would display higher psychological distress scores and a greater proportion would meet or exceed the threshold indicating clinically relevant psychological distress; and (2) the association between LDs and psychological distress would be modified by age, sex, ADHD, and impairment. In brief, the results demonstrated no significant difference in psychological distress in those with vs. without LDs when all covariates were included; however, tests for effect modification showed higher odds of clinically relevant psychological distress among those with LDs who were male or those aged 25–29 years, whereas lower odds were found among 15–19 year-olds. This suggests, in the context of the current analysis, that males and those in later emerging adulthood who have LDs may need additional support to mitigate psychological distress.

2. Materials and Methods

2.1. Participants

The current study utilized the 2012 Canadian Community Health Survey—Mental Health (CCHS-MH) data set, a national, cross-sectional study of Canadians 15 years of age or older. Exclusion criteria were peoples living on Indigenous reserves, full-time members of the Canadian Forces, and institutionalized individuals [24]. Recruitment has been previously described [24], but briefly, a three-stage sampling design was used, resulting in a total of 25,113 study participants. Data were collected between January and December of 2012 via a survey using computer-assisted personal interviewing [24]. The CCHS-MH data were weighted using a multi-step process that adjusted for out-of-scope dwellings and non-respondents by removing and reallocating survey weights, in turn allowing for population-level interpretations [24]. For these analyses, the study sample was restricted to participants 15–29 years of age (n = 5630).

In accordance with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans, usage of the CCHS-MH did not require ethics approval as it is a publicly available file from Statistics Canada [25]. Data are the property of Statistics Canada. An application can be made to the Canadian Research Data Centre for access.
2.2. Measures

The primary exposure was self-reported identification of an LD diagnosis by a health professional that was expected to last or had already lasted six months or more via the survey question “Do you have a learning disability?” [24]. The outcome of interest was psychological distress using the Kessler Psychological Distress Scale (K6) scores, which measures nonspecific distress over a one-month period to identify those with serious mental illness, as reflected in the DSM-IV criteria for major depression and generalized anxiety disorder [26]. Using a five-point Likert scale, each of the six items are coded from zero (none of the time) to four (all of the time) and then summed to result in a final score between 0 and 24. Scores $\geq 13$ indicate probable serious mental illness in general population samples [27]. The K6 has demonstrated excellent internal consistency ($\alpha = 0.89$) [26] and robust predictive power for serious mental illness in several epidemiological studies [28,29], including in emerging adults [30].

Three covariate groupings were established: demographic, psychosocial, and health. Demographic characteristics included in the analyses were age (five-year age increments from 15–29 years), sex (male or female), respondent’s current school status (attending school, college, Collège d’enseignement général et professionnel (CEGEP—an additional level of postsecondary education that occurs prior to university), or university), and total household income from all sources (<$20,000 to $80,000) [24]. Psychosocial covariates included the self-reported Social Provisions Scale (SPS)-10, which is a validated measure of perceived social support ($\alpha = 0.88$) [31], and whether the respondent had any family members with emotions, mental health, alcohol, or drug problems [24]. Health covariates included self-reported identification of ADHD diagnosis; past 12-month medication use for emotions, mental health, alcohol, or drug problems; a Statistics Canada derived variable on past 12-month help received via information, medication, counselling/therapy, other or none; the 12-item World Health Organization Disability Assessment Schedule (WHODAS) 2.0 score, which is a validated measure of past-month impairment ($\alpha = 0.94–0.98$) [32–34]; and lifetime substance use disorder, major depressive episode, and generalized anxiety disorder, as based on the World Health Organization Composite International Diagnostic Interview (WHO-CIDI) 3.0 [24].

2.3. Data Analysis

SAS 9.4 (SAS Institute Inc., Cary, NC, USA) was used for all statistical analyses. Analyses incorporated sampling weights using SAS SURVEY procedures to maintain the representativeness of the sample and ensure estimates from the complex survey design were not biased [35,36]. For descriptive statistics, Rao-Scott $\chi^2$ tests were calculated for categorical variables and $t$ tests were produced for continuous variables. The continuous K6 scores were not normally distributed and were consequently log-transformed using the natural logarithm. Covariates were tested for multicollinearity by examining variance inflation factor and tolerance—no concern for multicollinearity was found.

The association between LDs and psychological distress was examined using a multiple modelling strategy. Firstly, multiple regression was used. The unadjusted model used the binary LD variable as the exposure and the log-transformed K6 scores as the continuous outcome. In three steps, demographic, psychosocial, and health covariate blocks were included in the model. Secondly, logistic regression was used. The unadjusted model used the binary LD variable as the exposure, and the outcome was the dichotomized K6 scores (i.e., scores < 13 or $\geq 13$). Similarly, demographic, psychosocial, and health covariate blocks were included in three consecutive steps. In both multiple and logistic regression, the health covariate grouping omitted lifetime generalized anxiety disorder and major depressive episodes. To investigate effect modification by age, sex, ADHD, and impairment, stratified multiple and logistic regression analyses were computed using both the log-transformed and binary K6 outcomes, respectively. Unadjusted and adjusted models were produced. Stratification by impairment was based on the top tenth percentile of the WHODAS 2.0 (i.e., clinically relevant impairment) [37]. Hypothesis tests were two-sided with $\alpha = 0.05$. 
3. Results

3.1. Study Sample Characteristics

Descriptive statistics are shown in Table 1. The weighted frequency of emerging adults with LDs was 421 (7.5%). While there was no difference in the age distribution between those with vs. without LDs ($p = 2.70, p = 0.259$), there was a significantly higher proportion of males with LDs vs. without (63.1 vs. 51.9%; $p = 0.006$). There was no evidence for a significant difference in LD prevalence across school status (43.8 vs. 48.0%; $p = 0.323$).

| Characteristics                              | Total Sample N (%)/Mean (SE) | With LDs (n = 421) N (%)/Mean (SE) | Without LDs (n = 5209) N (%)/Mean (SE) | Rao-Scott $\chi^2$ t-Value (p-Value) |
|----------------------------------------------|-----------------------------|-------------------------------------|---------------------------------------|-----------------------------------|
| 15–19 years                                  | 1908 (33.9%)                | 170 (40.3%)                         | 1739 (33.4%)                         | 2.70 (0.259)                      |
| 20–24 years                                  | 1799 (32.0%)                | 128 (30.4%)                         | 1671 (32.1%)                         |                                   |
| 25–29 years                                  | 1922 (34.1%)                | 123 (29.3%)                         | 1799 (34.5%)                         |                                   |
| Female                                       | 2661 (47.3%)                | 155 (36.9%)                         | 2506 (48.1%)                         | 7.54 (0.006)                      |
| Attending school, college, CEGEP, or university | 2667 (47.7%)               | 184 (43.8%)                         | 2482 (48.0%)                         | 0.98 (0.323)                      |
| Total Household Income ≥ $80,000             | 2755 (49.0%)                | 179 (42.5%)                         | 2577 (49.5%)                         | 11.63 (0.020)                     |
| WHODAS 2.0                                   | 4.3 (0.2)                   | 8.0 (0.75)                          | 3.9 (0.17)                           | 5.37 (<0.001)                     |
| Has ADHD                                     | 311 (5.5%)                  | 147 (35.0%)                         | 164 (3.1%)                           | 246.71 (<0.001)                  |
| Used medication in past 12 months *          | 377 (6.7%)                  | 65 (15.5%)                          | 311 (6.0%)                           | 26.53 (<0.001)                   |
| Received help in past 12 months *            | 892 (15.9%)                 | 133 (31.7%)                         | 758 (14.6%)                          | 34.04 (<0.001)                   |
| Has family member with health concerns *     | 2098 (37.8%)                | 189 (45.9%)                         | 1909 (37.2%)                         | 4.03 (0.045)                     |
| SPS-10 Scores                                | 36.5 (0.1)                  | 35.3 (0.35)                         | 36.6 (0.09)                          | −3.81 (<0.001)                   |
| Lifetime any substance use disorder          | 1273 (22.9%)                | 142 (34.7%)                         | 1130 (22.0%)                         | 11.23 (0.001)                    |
| Lifetime major depressive episode            | 596 (10.6%)                 | 73 (17.4%)                          | 523 (10.1%)                          | 8.32 (0.004)                     |
| Lifetime generalized anxiety disorder         | 387 (6.9%)                  | 47 (11.3%)                          | 340 (6.6%)                           | 5.63 (0.018)                     |
| Log-transformed K6 scores                    | 1.3 (0.02)                  | 1.6 (0.06)                          | 1.3 (0.02)                           | 5.48 (<0.001)                    |
| K6 Scores ≥ 13                               | 159 (2.8%)                  | 29 (7.01%)                          | 129 (2.50%)                          | 17.44 (0.001)                    |

* For emotions, mental health, alcohol, or drug problems; significant findings in bold; ADHD = Attention-deficit/hyperactivity disorder; CEGEP = Collège d’enseignement général et professionnel; K6 = Kessler Psychological Distress Scale; LD/LDs = Learning disability/disabilities; SE = Standard Error; SPS = Social Provisions Scale; WHODAS = World Health Organization Disability Assessment Schedule.

The overall sample of emerging adults displayed high perceived social support ($M = 36.53, SE = 0.1$). Over one third of the sample reported that they had family member(s) with emotions, mental health, alcohol, or drug problems (37.8%), and those with LDs displayed a higher proportion compared with those without (45.9 vs. 37.2%, $p = 0.045$). WHODAS 2.0 scores suggested low impairment, on average, although those with LDs had higher impairment compared to those without LDs (8.0 vs. 3.9, $p < 0.001$). Individuals with LDs displayed 35.0% comorbidity with ADHD, compared to 3.1% in those without LDs. There were significantly higher proportions in past 12-month medication use (15.5 vs. 6.0%) and help received (31.7 vs. 14.6%), along with higher proportions of lifetime substance use disorder (34.7 vs. 22.0%), major depressive episode (17.4 vs. 10.1%), and generalized anxiety disorder (11.3 vs. 6.6%) in those with LDs vs. without LDs ($p < 0.05$ for all).

3.2. Association between Learning Disabilities and Psychological Distress

Emerging adults with LDs had higher mean log-transformed K6 scores (1.6 vs. 1.3%, $p < 0.001$) and a greater proportion above the K6 clinical threshold (7.0 vs. 2.5%, $p < 0.001$)
(Table 1). Multiple and logistic regression models are shown in Table 2. In the unadjusted model, having an LD was associated with a $\beta = 0.35$ unit increase in the log-transformed K6 score (95% CI = 1.23–1.30), and this association remained after adjusting for sociodemographic and psychosocial factors (semi-adjusted model). However, when all covariates were included (fully-adjusted model), the unit change in the log-transformed K6 scores was attenuated to $\beta = 0.10$ (95% CI = −0.04–0.24) for those with LDs and was no longer statistically significant.

Table 2. Psychological distress scores regressed on learning disability.

| Linear Regression Estimate | Logistic Regression OR |
|---------------------------|------------------------|
|                          | (95% CI) | (95% CI) |
| Adjusted R²/C-statistic  |          |          |
| Semi-Adjusted             | Fully-Adjusted |
| 0.12                      | 0.26      |
| Has a learning disability | 0.28 (0.16, 0.40) | 0.10 (−0.04, 0.24) |
| 0.26                      | 0.83      |
| 1.26 (1.15, 4.09)         | 1.17 (0.60, 2.27) |
| 0.12 (0.04, 0.17)         | 0.09 (0.03, 0.16) |
| 2.08 (1.24, 3.50)         | 1.90 (1.07, 3.38) |
| No income or <$20,000 (vs. ≥$80,000) | 0.11 (−0.29, 0.08) | −0.16 (−0.37, 0.05) | 0.65 (0.24, 1.76) | 0.42 (0.10, 1.68) |
| 0.00 (−0.10, 0.09)       | −0.05 (−0.13, 0.03) | 0.99 (0.55, 1.78) | 0.69 (0.34, 1.39) |
| 0.00 (−0.11, 0.08)       | −0.01 (−0.09, 0.07) | 0.66 (0.35, 1.26) | 0.56 (0.28, 1.12) |
| 0.03 (−0.12, 0.07)       | −0.01 (−0.10, 0.08) | 0.51 (0.25, 1.05) | 0.50 (0.21, 1.17) |
| SPS-10 Scores            | −0.05 (−0.05, −0.04) | −0.03 (−0.04, −0.02) | 0.77 (0.74, 0.81) | 0.82 (0.78, 0.87) |
| Has family member with health concerns * | 0.28 (0.21, 0.35) | 0.10 (0.03, 0.17) | 2.78 (1.57, 4.94) | 0.95 (0.48, 1.86) |
| Used medication in past 12 months * | 0.15 (0.05, 0.25) | 1.49 (0.73, 3.03) |
| Received help in past 12 months * | 0.31 (0.23, 0.41) | 4.68 (2.40, 9.11) |
| Has ADHD                 | 0.09 (−0.08, 0.25) | 1.10 (0.53, 2.31) |
| WHODAS 2.0 Scores        | 0.03 (0.02, 0.03) | 1.10 (1.08, 1.12) |
| Lifetime substance use disorder | 0.23 (0.16, 0.30) | 1.70 (1.00, 2.90) |

* For emotions, mental health, alcohol, or drug problems; significant findings in bold; reference group for age was 15–19 years and reference group for income was ≥$80,000; ADHD = Attention-deficit/hyperactivity disorder; CEGEP = Collège d’enseignement général et professionnel; CI = Confidence Interval; OR = Odds Ratio; SPS = Social Provisions Scale; WHODAS = World Health Organization Disability Assessment Schedule.

In the unadjusted model between LD status and dichotomized K6 scores, the odds of having K6 scores above the clinical threshold was 2.95 times higher in those with LDs compared with those without (95% CI = 1.74–4.99), and this association remained after adjusting for sociodemographic and psychosocial factors (semi-adjusted model). After including all covariates (fully-adjusted model), the odds were reduced to 1.17 and the association was not statistically significant (95% CI = 0.60–2.27).

3.3. Effect Modification in the Association between Learning Disabilities and Psychological Distress

Results of the stratified multiple and logistic regression analyses testing for effect modification are shown in Table 3. Unadjusted associations between LDs and log-transformed
K6 scores stratified by age, sex, ADHD status, and impairment demonstrated statistically significant estimates, which were subsequently attenuated in the adjusted models. Substantial differences in the magnitudes and directions of association in the adjusted models across strata suggested that these variables modified the association between LDs and psychological distress. For instance, the association between LDs and psychological distress among emerging adults without ADHD was twice as large and in the opposite direction compared with those with ADHD ($\beta = 0.15$ vs. $\beta = -0.08$).

**Table 3.** Stratified analysis of psychological distress scores regressed on learning disability.

|                          | Linear Regression Estimate (95% CI) | Logistic Regression OR (95% CI) |
|--------------------------|------------------------------------|---------------------------------|
|                          | Unadjusted Adjusted                | Unadjusted Adjusted              |
| 15–19 years              | 0.28 (0.11, 0.46)                  | 0.06 (–0.12, 0.23)              |
| 20–24 years              | 0.28 (0.07, 0.49)                  | –0.02 (–0.14, 0.11)            |
| 25–29 years              | 0.47 (0.20, 0.74)                  | 0.28 (–0.04, 0.60)             |
| Male                     | 0.31 (0.14, 0.48)                  | 0.12 (–0.08, 0.33)             |
| Female                   | 0.44 (0.28, 0.60)                  | 0.05 (–0.09, 0.19)             |
| Has ADHD                 | 0.04 (–0.29, 0.36)                 | –0.08 (–0.27, 0.12)           |
| Does not have ADHD       | 0.31 (0.14, 0.48)                  | 0.15 (–0.01, 0.31)             |
| WHODAS Scores ≥ 90th percentile | 0.17 (–0.04, 0.39)              | 0.05 (–0.10, 0.20)            |
| WHODAS Scores < 90th percentile | 0.28 (0.13, 0.43)              | 0.16 (–0.01, 0.33)             |

Significant findings are shown in bold. Adjusted models controlled for the potential confounding effects of demographic, psychosocial, and health variables. ADHD = Attention-deficit/hyperactivity disorder; CI = Confidence Interval; OR = Odds Ratio; WHODAS = World Health Organization Disability Assessment Schedule.

Unadjusted associations between LDs and dichotomized K6 scores stratified by age, sex, ADHD status, and impairment were statistically significant, except for those aged 15–19 years, those with ADHD, and for both strata of impairment. Associations remained statistically significant for those aged 15–19 and 25–29 years and males in the adjusted models, such that higher odds of clinically-relevant psychological distress were found among those with LDs who were male or those aged 25–29 years, whereas lower odds were found among 15–19 year-olds. Again, substantial differences in the magnitudes and directions of association in adjusted models across strata provided evidence of effect modification in the association between LDs and clinically relevant psychological distress. For instance, the association among males was 3.6 times as large and in the opposite direction compared with females (OR = 2.39 vs. OR = 0.65).

4. Discussion

The current study investigated the association of LDs and mental health of emerging adults. Adjusting for relevant covariates, there was no evidence to suggest a difference in psychological distress between emerging adults with vs. without LDs in the overall sample. This finding appears contrary to previous work demonstrating increased mental illness, including psychological distress, among those with LDs [6,9,12,22]. However, effect modification by age, sex, ADHD status, and impairment was evident across all adjusted models for both continuous K6 scores and dichotomized K6 scores, indicating clinically relevant psychological distress.

Younger emerging adults (i.e., 15–19 years) with LDs were less likely to have clinically-relevant psychological distress, whereas older emerging adults (i.e., 25–29 years) with LDs were more likely to have clinically-relevant psychological distress. This differential effect across age may be attributed to a number of factors. The youngest emerging adults may be receiving more school-based support [38], while the older group may be experiencing disruptions to health service access during the transition from the pediatric to the adult...
health system [39], or the transition to higher education and the workplace may have created additional challenges due to lack of preparedness or the loss of their support system [40]. Evidence suggests that individuals with chronic health conditions often experience declines in mental health during this time [41,42]. Alternatively, it is possible that years-with-diagnosis influences psychological distress. Recent diagnosis for LDs has demonstrated a negative effect on health-related quality of life [43], while living with a diagnosis for longer allows time for positive coping and opportunities to seek necessary support, thus improving quality of life [44]. While it could not be tested with the CCHS-MH, it is possible that a large proportion of older emerging adults represented relatively new LD diagnoses, which drove the association.

Learning disabilities were associated with clinically relevant psychological distress in males only. A lack of statistical significance among females with LDs was unexpected given previous evidence has shown a strong and statistically significant association between LD and mental illness among females [6,10]. Nevertheless, the sex-based associations between LDs and internalizing disorders have not been consistent [12]. It is possible that the findings could be a function of the study methods used; for instance, the control of error with inclusion of a large number of potential confounding factors in the regression models. Additional research is warranted.

Lack of evidence for differences across ADHD status and impairment was contrary to the hypotheses. Previous research is mixed, though it is possible that the inclusion of an array of covariates in the present study may have also adjusted for potential mediators in the pathway linking LDs and psychological distress, thus attenuating any potential association. Evidence suggests that differences in the mental health of individuals with LD, ADHD, or their comorbidity may be due to psychosocial variables and substance use [16], both of which were adjusted for in the models. Nevertheless, comorbid ADHD has implications for family functioning and health service use [45], and this may ultimately impact the mental health of emerging adults with LDs.

It is well-documented that emerging adults are at an increased risk for mental illness, though few studies have considered emerging adulthood as a single population to explore the association between LDs and mental illness [46]. For example, one study showed that first-year college students with LDs reported more school disengagement, substance use, and emotional difficulties (i.e., felt overwhelmed, depressed) compared with their peers without disabilities [16]. Considering that emerging adults lose school-based support systems when transitioning from secondary school to higher education or the workplace, there is a pressing need for advocacy, resources, and support for the prevention of mental illness, as well as treatment of mental illness, especially among those with LDs [47].

Broad implications of the current study pertain to awareness, prevention, and support for mental illness in emerging adults with LDs. Prevention of mental illness may be possible with earlier diagnosis of LDs. Not only is earlier diagnosis financially advantageous due to LD assessment coverage while in school, but it may also contribute to earlier support and better strategies to navigate daily challenges associated with LDs. Additionally, this can provide an opportunity to screen for and identify mental illness that may accompany LD diagnosis. Furthermore, increased awareness of LDs by educators and parents/guardians may aid in the attainment of accommodations, which would likely contribute to academic success and in turn prevent or mitigate the potential mental health impacts of academic challenges. Within school or work environments, increased awareness of LDs may also help reduce stigma and disability discrimination and create supportive environments, and thus help prevent mental illness in those with LDs [48–50]. Since more individuals with LDs are pursuing higher education than in the past, these measures are paramount in ensuring that they are well-supported in the transition out of secondary school in order to avoid unintentional negative impacts on mental health in emerging adulthood [51,52]. Prevention of and support for mental illness in emerging adults with LDs relies on improved educational and psychosocial resources, policies, and practice within post-secondary institutions and the workplace that adequately prepare and support individuals with LDs.
Moving forward, research is needed to examine the longitudinal associations between LDs and mental illness across the age spectrum of emerging adulthood. With the inclusion of multiple comparison groups, the natural course of mental health among emerging adults with LDs can be delineated, contrasted with other subpopulations (e.g., non-LD controls, those with other chronic health conditions), and windows of opportunity for intervention identified. Further, with a naturalistic approach, potential changes to mental health prior to LD diagnosis can be identified and used to inform screening and other preventive interventions. Causal modelling frameworks that consider the role of personal and interpersonal factors in the mechanisms implicated in the development of psychological distress and mental illness among emerging adults with LDs would make important contributions to the field—exploring how changes in the support system may influence mental health can provide evidence to improve policy and practice.

Findings should be interpreted in the context of some limitations. Firstly, no information about age at diagnosis, LD type, or severity was available in the CCHS-MH. However, LD severity may have been accounted for by including impairment, measured by the WHODAS 2.0, as a proxy measure. Secondly, the cross-sectional design of the CCHS-MH prevented inferences related to temporality. Additionally, although the data are from the 2012 CCHS-MH, an updated survey iteration for 2022 has not yet been released. Further, adjustments for multiple comparisons were not performed, though there are strong arguments against doing so [53]. Lastly, given respondents were prompted to self-report whether they had received an LD diagnosis by a health professional, there was risk for reporting bias due to collection of past and sensitive personal information. Namely, recall and social desirability biases may have influenced responses. Validating LD diagnoses using administrative or physician records was not possible in this study. We note that the use of self-reported diagnoses may be problematic for chronic conditions that have very low prevalence in the population [54], which can lead to potential misclassification and the attenuation of measures of association. However, evidence suggests that this information bias is negligible [55].

5. Conclusions

The current epidemiological study showed that emerging adults with LDs did not report greater levels of psychological distress compared to emerging adults without LDs. However, tests for effect modification showed higher odds of clinically relevant psychological distress among those with LDs who were male or aged 25–29 years, whereas lower odds were found among 15–19 year-olds. These findings support the need for improved policy and practice, namely improved awareness and support in post-secondary institutions and the workplace that consider the unique challenges associated with mental illness in emerging adults with LDs, especially males and those in later emerging adulthood. Consequently, investing in such supports may help reduce or prevent mental illness in individuals with LDs or other invisible disabilities, especially as they navigate emerging adulthood. Future studies are encouraged to use longitudinal designs that incorporate causal frameworks to more comprehensively understand the association between LDs and mental illness.

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Institutional Review Board Statement: In accordance with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans, usage of the CCHS-MH did not require ethics approval as it is a publicly available file from Statistics Canada.
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Data Availability Statement: Restrictions apply to the availability of these data. Data was obtained in partnership with Statistics Canada via the Data Liberation Initiative (https://www.statcan.gc.ca/en/microdata/dli, accessed on 24 January 2020).

Conflicts of Interest: The authors declare no conflict of interest.

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