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Relationships between Psychosis Symptoms, Psychosocial Factors, and Depression among Individuals in an Early Phase of Psychosis Illness

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Abstract

Background: Depressive symptoms are common within schizophrenia spectrum disorder populations, yet few studies have examined the various factors and symptoms relating to depression in an early phase of illness. This study examined a model of psychosocial factors (distress, peer rejection, emotional support, perceived hostility), psychosis symptoms (positive, negative, general), and depression among individuals in an early phase of psychosis illness.

Methods: Data were obtained from the Human Connectome Project for Early Psychosis (HCP-EP) including 183 individuals between the ages of 16 and 35 at the time of consent and met criteria for having onset of affective or non-affective psychosis within 5 years. Clinical assessments and questionnaires were administered, and data were analyzed in SPSS and MPlus.

Results: Peer rejection ($p<0.05$), distress ($p<0.001$), perceived hostility ($p<0.05$), and general symptoms of psychosis ($p<0.001$) significantly related with depression. Bivariate associations existed between all psychosocial factors and psychosis symptoms with the exception of negative symptoms.

Discussion: Understanding symptoms and factors that associate with depression among individuals with psychosis in an early phase of illness can allow clinicians to tailor intervention efforts to focus on distress, peer rejection, perceived hostility, and general psychosis symptoms.

Keywords: Early psychosis • Depression • Psychosis symptoms

Introduction

Many people with Schizophrenia Spectrum Disorders (SSD) experience symptoms of depression in a lifetime with depression being widely accepted as a distinct aspect of SSD experiences [1-4]. Although it has been demonstrated in some studies that depressive episodes may precede a first episode of psychosis [5,6], there is evidence that depression may be most evident in the acute phase of psychosis illness [7]with depressive symptoms being described as common features often concurrently or subsequently presenting in early phases of psychosis illness [1,8-10]. In fact, up to 50% of people experiencing a first episode of psychosis experience depressive symptoms and data show depression among those in a chronic phase of SSDs illness range from 20% to 70% [4,8].

Depression can negatively impact clinical outcomes and creates compounding challenges for those with SSDs, with depression being viewed as a hindrance to recovery [4,11]. Conley and colleagues found that those with an SSD and depression scored worse on 90% of their clinical and service use outcome variables, including more visits to emergency psychiatric services, increased suicide thoughts and attempts, fewer social relationships, and a lower quality of life [2]. Given treating depression in an early phase of psychosis illness improves functional outcomes and reduces risk for suicide, there is a strong need to better understand symptoms and factors in relation to depression among people with psychosis symptoms to better inform intervention efforts [4].

One potential psychosocial factor of importance in relation to depression is emotional support. It is well documented that support networks diminish greatly after the onset of a SSD and within a first episode of psychosis [12-14]. When support networks break down, people in early psychosis can experience challenges in receiving emotional support and having experiences of feeling connected to others emotionally [15]. Strong social and emotional support can serve as a buffer for depression, and it is theorized that emotional support helps build self-esteem, which also can be protective against depression [16]. In fact, people with SSDs who have greater levels of perceived support exhibit lower levels of depression [14].

A second potential psychosocial factor is perceived hostility. The perception of others as hostile may lead to isolation and a more limited social support system, which in turn can relate to experiences of depression [17]. People with SSDs may perceive hostility not only from others around them, but also from their own internal experiences with psychosis symptoms (e.g., auditory hallucinations or paranoia) which may also be attributed to external antecedents [18]. Given auditory hallucinations are highly prevalent among individuals with SSDs, specifically among 70% of people, there is greater potential for perceived hostility to be greater in comparison to those without auditory hallucinations [19]. Furthermore, studies show that between ⅔ to ¾ of people with auditory hallucinations endorse depression resulting from their auditory hallucination symptom experiences [1]. Investigating the phenomenon of perceived hostility can lead to a better understanding of how this factor may relate to psychosis symptoms and depression.

A third potential psychosocial factor is distress. Previous literature reports a link between distress and depression with studies suggesting people with SSDs experience distress from both positive (e.g., hallucinations, delusions) and negative (e.g., affective flattening, alogia) symptoms of psychosis [20-22]. Experiences of distress can lead to poorer short- and long-term outcomes for people with SSDs, including depression and positive symptoms of psychosis [21]. Despite well-demonstrated knowledge of distress relating to depression in non-SSD samples, experiences of distress

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in people with SSDs are understudied [21,23].

A final potential psychosocial factor is peer rejection. While much of the existing research on peer rejection focuses on youth and adolescents [24-26], peer rejection at all ages inherently relates to social exclusion, which is well-known to associate with both depression and psychosis symptoms [27,28]. The experience of psychosis may increase the likelihood of peer rejection in relation to the development and maintenance of psychosis symptoms, and especially so in an early phase of illness when an individual is adjusting to their symptoms and navigating new social cognitive, social skill, and cognitive deficits [29]. Furthermore, one's appraisal of peer rejection is importantly related to the potential of subsequent experiences of depression [30]. This is particularly concerning in an early phase of psychosis illness because peer rejection can deprive people of social support and positive relationships, which are both critical for one's overall wellbeing [31]. In fact, a review by Lincoln and colleagues found that those with SSDs experience similar levels of distress related to social exclusion as the general population but appraise and cope with their experiences of rejection differently [29]. Taken together, peer rejection may play a significant role in both psychosis and depression, warranting further investigations.

Depressive symptoms are common within SSD symptom experiences, yet there is an absence of studies examining relationships between depression and various psychosocial factors and psychosis symptoms among individuals in an early phase of psychosis illness. As such, the current study aimed to examine the relationships between psychosocial factors (distress, peer rejection, emotional support, and perceived hostility), psychosis symptoms (positive, negative, and general) and depression among individuals in an early phase of psychosis illness. We hypothesized a model such that worsening psychosocial factors (less emotional support and greater distress, peer rejection, and perceived hostility) and psychosis symptoms (positive, negative, and general) would relate with the experience of greater depression. In addition, we hypothesize that bivariate associations would exist between all psychosocial factors and psychosis symptoms.

Materials and Methods

Cross-sectional secondary data were obtained from the Human Connectome Project for Early Psychosis (HCP-EP). The HCP-EP aims to obtain data similar to the original Young Adult HCP, yet with focus on young adults who are in an early phase of psychosis within the first 5 years of symptom onset. Participants were recruited from 4 clinical sites in the United States to participate in the HCP-EP: 1) Indiana University (IU) Psychotic disorders program, Prevention and Recovery Center for Early Psychosis (PARC); 2) Beth Israel Deaconess Medical Center-Massachusetts Mental Health Center (BIDMC-MMHC), Prevention of and Recovery from Early Psychosis (PREP) program; 3) McLean Hospital, McLean on Track, and 4) Massachusetts General Hospital (MGH), First episode and Early Psychosis Program (FEPP).

Patients with psychosis were recruited as potential participants through advertisements in communities of the clinical sites, in-person announcements at community mental health agencies near clinical sites, informational mailings following medical record review, and referrals from providers at clinical sites. Eligibility screening involved a semi-structured survey *via* telephone including the collection demographic and clinical information. Eligible participants subsequently completed a clinical interview, self-report questionnaires, and cognitive and motor tasks. Greater detail of HCP-EP recruitment and procedures can be found in the HCP-EP 1.1 data release manual on the NIMH Data Archive (NDA) website and within both Demro et al. and Elam et al. [32,33]. The current secondary data study was determined to be Exempt by the University of Michigan Institutional Review Board.

Sample

Participants in the current study include 183 individuals with affective and non-affective psychosis in the HCP-EP, all of whom were between the ages of 16 and 35 at the time of consent, fluent in English, and meeting criteria for affective or non-affective psychosis with onset being within 5 years. Affective psychosis included major depression with psychosis, or bipolar disorder with psychosis, while non-affective psychosis included schizophrenia, schizoaffective disorder, schizophreniform, psychosis Not Otherwise Specified (NOS), delusional disorder, or brief psychotic disorder. Participants were excluded if they had the following: 1) substance induced psychosis or psychosis due to a medical problem, 2) IQ less than 70, 3) active medical condition affecting the brain or cognitive functioning (e.g., seizure disorder, epilepsy, stroke), 4) severe substance use disorder within 90 days of screening, 5) high-risk status for suicide (i.e., active ideation or suicide attempt within 30 days of screening), 6) ECT treatment within 12 months of screening, 7) HIV+status, 8) contraindication to undergo MRI scan (e.g., implanted pacemaker, medication pump), and 9) overtly aggressive behaviour.

Measurement

Clinical assessments and questionnaires were administered by trained study personnel, with all clinical interviews and supporting materials being reviewed by a team of at least 2 clinical psychology doctoral students and/or postdoctoral associates who ultimately determined all DSM diagnoses. Reliability was established on all Toolbox measures prior to the start of enrollment. Reliability and consensus diagnosis is ongoing for all diagnostic interview, conducted on a monthly basis with all diagnostic team staff across sites [34]. The Structured Clinical Interview (SCID-5-RVI) was used to screen participants to establish eligibility to participate, and the following variables were assessed at baseline and are of focus in the current study [35]:

Depression: Depression was measured with the Montgomery-Asberg Depression Rating Scale (MADRS) [36]. This scale contains 10 items to measure sadness, tension, sleep, concentration, pessimistic thoughts, suicide thoughts, low energy, and apathy. Response categories range from 0 to 6 and vary in alignment with each item (e.g., no sadness being represented by a 0 and extremely despondent being represented by a 6 for question 1 on apparent sadness). Total scores range from 0 to 60 with higher scores indicating more severe depression, and the Chronbach's alpha was .87.

Psychosis symptoms: Psychosis symptoms were measured with the Positive And Negative Syndrome Scale (PANSS) [37]. The measure contains 30 items that assess for symptoms of psychosis including positive symptoms (e.g., hallucinations), negative symptoms (e.g., affective flattening), and general psychopathology (e.g., motor retardation). Response categories range from absent (1) to extreme (7) and items are summed to obtain a total score. Positive symptom subscale scores range from 7 to 49, negative symptoms from 7 to 49, and general symptoms from 16 to 112; all with higher scores indicating greater presence and severity of symptoms. The Chronbach's alpha was 0.81 for positive symptoms, 0.79 for negative symptoms, and 0.80 for general symptoms.

Distress: Distress was measured with the Patient-Reported Outcomes Measurement Information System (PROMIS) emotional distress scale [38]. Item examples include "In the past 7 days I felt worried" and "in the past 7 days I felt fearful." Seven items of the scale focus on anxiety in relation to distress, with response categories ranging from 1 (never) to 5 (always). Scores are summed to range from 7 to 35 with higher total scores indicating the experience of greater distress. The Chronbach's alpha was 0.95.

Peer rejection: Peer rejection was measured with the NIH Toolbox Item Bank v3.0 Emotion Domain Peer Rejection and Perceived Rejection Surveys [39]. Designed to gauge the level of peer rejection, this 8-item measure with response categories ranging from 1 (never) to 5 (always) and a higher total score indicating the experience of greater peer rejection. Item examples include "In the past month, how often do others act like they don't have time for you" and "In the past month, how often do others act like they don't want to hear about your problems." Scores are summed and range

from 8 to 40, with higher scores indicating a higher level of peer rejection. The Chronbach's alpha was 0.94.

Emotional support: Emotional support was measured with the NIH Toolbox Item Bank v3.0 Emotional Support Survey [39]. The emotional support scale includes 18 items scored from 1 (never) to 5 (always). Item examples include "In the past month, please describe how often I have someone who understands my problems" and "In the past month, please describe how often I have someone who will listen to me when I need to talk." Scores are summed and range from 18 to 90, with higher scores indicating greater emotional support. The Chronbach's alpha was 0.93.

Perceived hostility: Perceived hostility was measured with the NIH Toolbox Item Bank v3.0 Perceived Hostility Surveys [39]. This scale measures the level of hostility participants perceive from others, with item scores ranging from 1 (never) to 5 (always). Examples of items include "In the past month please describe how often people in your life argue with me" and "In the past month please describe how often people in your life act in an angry way toward me." Scores of the 7 items are summed and range from 7 to 35, with higher scores indicating a higher perception of hostility from others. The Chronbach's alpha was 0.93.

Quantitative modeling and analysis

Data were analyzed using SPSS 27 and Mplus 8. Univariate distributions, bivariate correlations, and missing data were examined among all variables. Next, Structural Equation Modeling (SEM) was performed to examine the study aims using a robust (Huber-White) maximum likelihood algorithm to deal with nonnormality and variance heterogeneity. Full Information Maximum Likelihood (FIML) methods were also used, and model fit was evaluated using both global (chi-square, CFI, TLI, standardized RMR, RMSEA) and focused (standardized residuals and modification indices) fit indices [40]. Acceptable fit was determined by a minimum cutoff of 0.95 for CFI and TLI, a maximum cutoff of 0.06 for RMSEA, and a maximum cutoff of 0.08 for SRMR [41]. Prior to modeling, explorations of depression and general symptoms showed a weak correlation (r=0.34), and a moderate correlation was found for depression and distress (r=0.45). Depression functioned as the endogenous outcome variable while psychosocial (distress, peer rejection, emotional support, and perceived hostility) and psychosis (positive, negative, and general symptoms of psychosis) variables functioned as independent exogenous variables. In addition, given the potential associations between psychosocial factors and psychosis symptoms, covariances of exogenous variables were estimated in the model. Sex, age, and affective status (affective psychosis vs. non-affective psychosis) were included as covariates in the model.

Results

Demographic and clinical characteristics are presented in Table 1. On average, participants were 23.12 years of age (Standard Deviation (SD)=3.71) with a range of 16 to 35. Participants most often endorsed being male sex (n=104, 61.5%), White (n=91, 53.8%), and non-Hispanic/Latinx (n=154, 91.1%). Participants attended 14 years of school on average (SD=2.04) with a range of 10 (9th grade being the first year of high school) to 21 (4 years of graduate school) years. The majority of participants had a diagnosis of schizophrenia (n=80, 47.9%), followed by major depressive disorder (n=27, 16.2%), and schizoaffective disorder (n=17, 10.2%). A total of 54 participants (32%) were categorized as having affective psychosis and 115 (68%) non-affective psychosis.

Table 1. Demographic and clinical characteristics of participants.

Characteristic	n	%
Age (M ± SD)	169	23.12 ± 3.71
Years of Education	169	14.18 ± 2.04
Sex		
Male	104	56.8
Female	65	35.5
Race		
Black or African American	58	31.7
White	91	49.7
American Indian or Alaska Native	2	1.1
Asian	10	5.5
More than one race	2	1.1
Ethnicity		
Hispanic/Latinx	15	8.2
Non-Hispanic/Latinx	154	84.2
Affective psychosis status		
Affective psychosis	54	29.5
Not affective psychosis	115	62.8
Schizophrenia diagnosis		
No	87	47.5
Yes	80	43.7
Schizophrenia diagnosis		
No	156	85.2
Yes	10	5.5
Schizoaffective diagnosis		
No	150	82
Yes	17	9.3
Major depressive diagnosis		
No	1	0.5
Yes	27	14.8
Depression (M ± SD)	167	8.34 ± 8.87
Positive symptoms of psychosis (M ± SD)	181	11.60 ± 4.52
Negative symptoms of psychosis (M ± SD)	181	13.27 ± 5.36
General symptoms of psychosis (M ± SD)	181	24.69 ± 5.89
Peer rejection (M ± SD)	169	17.18 ± 7.19
Emotional support (M ± SD)	169	30.82 ± 7.10
Distress (M ± SD)	173	29.47 ± 6.68
Perceived hostility (M ± SD)	169	17.25 ± 7.20

Model fit

Figure 1 presents parameter estimates for the structural model with standard errors in parentheses. Global fit indices all pointed to good model fit (χ^2=5.634, df=9, p-value=0.776; CFI=0.997, TLI=0.994, RMSEA=0.014, p-value for close fit=0.923, standardized RMR=0.017) and focused fit indices (standardized residuals <|2| and modification indices <|4|) revealed no points of stress on the model. Positive symptoms, negative symptoms, general symptoms of psychosis, distress, peer rejection, emotional support, perceived hostility, and all covariates accounted for 44% of the variance in depression.

Relationships between exogenous psychosocial variables and endogenous depression

Distress, peer rejection, and perceived hostility significantly related to depression. For every one-unit increase in distress, there was an associated increase in depression (b=0.449, SE=0.10, p<0.001) and for every one-unit increase in peer rejection, there was an associated increase in depression (b=0.224, SE=0.11, p<0.05). For every one-unit increase in perceived hostility, there was an associated decrease in depression (b=-0.193, SE=0.10, p<0.05).

Relationships between exogenous psychosis variables and endogenous depression

General symptoms of psychosis significantly related to depression. For every one-unit increase in general symptoms, there was an associated increase in depression (b=0.627, SE=0.12, p<0.001). Positive and negative symptoms did not significantly relate to depression as shown in Table 2.

Associations between exogenous psychosis and psychosocial variables

A covariance table is provided in Table 2 to illustrate associations between all exogenous variables not shown in Figure 1. All psychosis and psychosocial variables related to one another, with exception for negative symptoms of psychosis. While the majority of associations had positive coefficients, emotional support negatively related to distress, peer rejection, hostility, positive symptoms, and general symptoms.

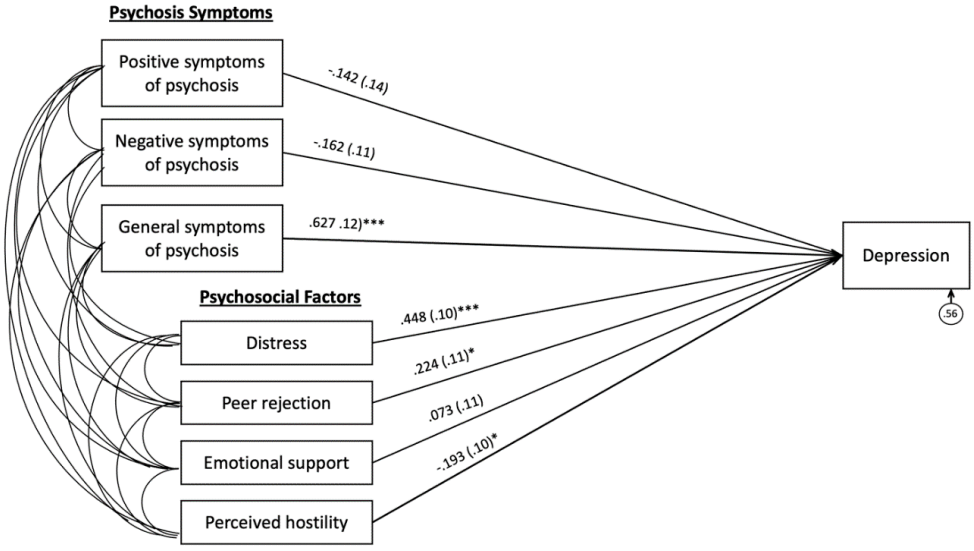

Figure 1. Model findings of psychosis symptoms and psychological factors.

Table 2. Covariance matrix of all exogenous variables.

Variable	1	2	3	4	5	6	7
Distress	-	-	-	-	-	-	-
Peer rejection	b=24.18 SE= 4.07 p<0.001***	-	-	-	-	-	-
Emotional support	b=-16.78 SE=3.81 p<0.001***	b=-29.28 SE=4.48 p<0.001***	-		-	-	-
Perceived hostility	b=21.27 SE=3.98 p<0.001***	b=33.07 SE=4.68 p<0.001***	b=-20.05 SE=4.18 p<0.001***	-	-	-	-
Positive symptoms of psychosis	b=6.93 SE=2.33 p<0.01**	b=9.81 SE=2.57 p<0.001***	b=-8.58 SE=2.52 p<0.01**	b=8.78 SE=2.54 p<0.01**	-	-	-
Negative symptoms of psychosis	b=0.38 SE=2.75 p>0.05	b=-0.29 SE=2.94 p>0.05	b=-3.34 SE=2.93 p>0.05	b=-2.82 SE=2.95 p>0.05	b=1.05 SE=2.86 p>0.05	-	-
General symptoms of psychosis	b=17.08 SE=3.22 p<0.001***	b=13.99 SE=3.37 p<0.001***	b=-13.45 SE=3.33 p<0.001***	b=8.81 SE=3.28 p<0.01**	b=13.06 SE=2.24 p<0.001***	b=10.83 SE=2.47 p<0.001***	-

Note: SE: Standard Error; ***p<0.001; **p<0.01; *p<0.05.

Discussion

Depressive symptoms are prevalent among individuals with SSDs, and treating depression in an early phase of psychosis illness can lead to better outcomes [4]. The current study examined relationships between psychosocial factors (distress, peer rejection, emotional support, and perceived hostility), psychosis symptoms (positive, negative, and general) and depression among individuals in an early phase of psychosis illness. Pertaining to psychosocial factors, results indicated that distress, peer rejection, and perceived hostility significantly related to depression. This aligns with the diathesis-stress model and adolescent-specific literature indicating that distress and peer rejection relate with greater depression [25,42,43]. Emotional support was not significantly related to depression in our study, and this finding was unexpected given the literature has established important understandings of emotional support playing a role in depression [12,14,44]. It is possible that constraints in measurement contributed to this null finding, as discussed in the limitations section below.

While it was anticipated that greater distress and peer rejection would relate to greater depression, it was not hypothesized that greater perceived hostility would relate to less depression. It is possible this finding could be explained by the perception of hostility from other people being an external attributing experience. Throughout such experience, the individual may believe others whom they perceive to be hostile are problematic, as opposed to internalizing the experience with focus on oneself contributing to the potentially hostile exchange. This may be similar to hostile attribution bias [45]. Relatedly, it is possible that part of the perceived hostility experience could pertain to over-attribution of social threat. Literature supports the phenomenon of psychosis symptomatology having an impact on social cognition, involving the potential of misinterpreted facial expressions and interactions resulting in inflated perception of threat [46-48]. The perceived hostility area of research within SSDs and psychosis is underdeveloped and warrants greater investigations in the future.

As for psychosis symptoms, results indicated that only general symptoms of psychosis significantly related to depression. This aligns with some prior studies showing negative symptoms did not relate with depression [49,50] and highlights the limited understanding of how negative symptoms and depression relate [51]. The unexpected positive symptom null finding is reinforced by mixed literature of the relationships between positive symptoms and depression [52-54]. Greater examinations of relationships between various psychosis symptoms and depression are needed to clarify the mixed findings to date, with longitudinal investigations being critically needed to examine the evolution of such symptoms across time. It is particularly essential to clarify the mixed literature on study findings point towards two important clinical implications.

First, psychotherapies and psychosocial treatments can provide opportunities for individuals to explore and address experiences of distress, peer rejection, emotional support, and perceived hostility and to increase the likelihood that psychosis symptom experiences relate less with depressive symptoms. Psychotherapies such as Cognitive-Behavioral Therapy (CBT) and Dialectical Behavior Therapy (DBT) can offer many tools and techniques to address experiences examined in the current study. Cognitive-Behavioral Therapy for psychosis (CBTp) in particular can focus on identifying and adjusting appraisals and schema that relate to psychosis symptomatology experiences and often result in experiences of distress [55-57]. DBT has the potential to provide individuals in an early phase of psychosis with skills to regulate emotions, tolerate distress, and effectively interact with others [58]. Taken together, both evidence-based approaches can offer opportunities to address the psychosocial factors and psychosis symptoms of focus in the current study with an overall goal of improving depression.

Second, there is strong potential for peer support specialists to bring important value to the care of individuals with SSDs. Peer Support Specialists (PSS) with lived experience and mental health training can offer emotional support and psychosocial skills to assist clients managing peer rejection and distress [59]. Literature indicates that the benefit of peer support is partially due to many people desiring to not be addressed as passive recipients in health programming, but rather as active agents with valuable knowledge and experience [60]. Shalaby and Agyapong have noted a widening gap between people experiencing mental illness and health care professionals, with individuals in the current study (mean age of 23 a range of 16 to 35) being among the least likely age groups to seek professional help for mental health despite being among the most affected age groups by mental illness [61,62]. Studies show that PSS-delivered services were reportedly helpful when peer facilitators are similar in age and share similar experiences with mental healthcare services [63]. Therefore, as mental health professionals aim to identify and lessen barriers to mental health care, there is strong potential for PSS to contribute to closing the gap that exists between people in an early phase of psychosis illness and professional care [61].

There are several important limitations to note. First, data were secondary as the HCP-EP was not designed to address the specific aims of the current study, resulting in several measurement constraints. One constraint in particular was that the dataset did not include measurement to capture a history of depressive symptoms, including a timeframe of potential onset, to allow for greater understandings of if depression more often preceded or followed psychosis symptom onset. Another constraint pertains to measurement of depression, where it could be preferable to use the Calgary Depression Scale for Schizophrenia (CDSS) given its intentional design to assess for depression within the context of experiencing psychosis symptoms within SSDs. Second and related to measurement, is important to highlight significant associations between exogenous psychosocial and psychosis variables (with the exception of negative symptoms), indicating their combined variance in explaining the experience of depression. Future longitudinal studies are needed to elucidate these relationships. Third, the sample size was relatively small (n=183) and a larger sample in future research could allow for investigations of differences by groupings such as affective and non-affective psychosis, history of depression symptoms, and more. Lastly, this study examined baseline data and therefore is cross-sectional in nature. Future longitudinal research is greatly needed to examine the dynamic fluctuations of all variables over time.

Conclusion

The current study examined relationships between psychosocial factors, psychosis symptoms, and depression in early psychosis. Depression is a common feature within SSD experiences, and the current study's findings show various areas of focus for intervention efforts that could potentially alleviate some related factors and symptoms, thereby reducing depression. Notability, psychosocial factors of focus in the current study are potentially more amenable to psychotherapeutic interventions than the positive, negative, and general symptoms of psychosis. Our team's future longitudinal investigations of HCP-EP data will continue examining the complex relationships between psychosis symptoms and depression among individuals in an early phase of psychosis illness with a goal of identifying treatment targets to improve clinical outcomes.

Declaration

Disclosure of interest

The authors disclose no conflicts of interest.

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