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The Influence of Psychotic-Like Experiences on Intent to Seek Treatment: Findings From a Multisite Community Survey of Mental Health Experiences

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Abstract

Psychotic-like experiences (PLEs) may reflect elevated risk for serious mental illness, including psychosis. Although some studies report an association between PLEs and increased service utilization, there is evidence of unmet need among individuals with PLEs, with few studies exploring the relation between PLEs and intent to seek treatment. Characterizing factors that underlie intent to seek treatment in individuals with PLEs may assist in identifying young people in need of services and prioritizing symptoms of greatest significance. Non-help-seeking participants ages 16–30 years ($n_{analysis}$ = 2,529) in a multi-site study completed online questionnaires of PLEs (PRIME with distress), depression (CES-D) and anxiety (STAI). Associations between PLEs, depression, anxiety and intent to seek treatment were analyzed through multiple linear regressions. PRIME scores predicted intent to seek treatment, even when controlling for symptoms of anxiety and depression (all *p*s < .05). Item-level analyses suggested that this association was driven by items 12 (“going crazy”) and 5 (“confused if things are real or imagination/dreams”). Item 9 (“feeling like one’s mind is playing tricks”) was negatively associated with intent to seek treatment (all *p*s < .05). PLE total scores predicted treatment-seeking intention independent of depression and anxiety in this general community sample. Distinguishing what is and is not real and “going crazy” were the two items most strongly driving this association. Findings suggest that PLEs represent clinically relevant experiences resulting in increased intention to seek services, with certain PLEs potentially serving as candidate targets for intervention.

1. Introduction

Psychotic-like experiences (PLEs) are more prevalent than psychotic disorders in the general population, with lifetime prevalence estimates ranging from 5% to 12.25% (Barragán, Yamada, Lee, & Barrio, 2016; Kelleher et al., 2012; van Os, Linscott, Myin-Germeys, Delespaul, & Krabbendam, 2009). By definition, PLEs are less severe, distressing, and functionally impairing than full-threshold psychosis; however, they can cause distress or impairment and are thought to confer risk for serious mental illness, including psychosis (Healy et al., 2019; van Nierop et al., 2012). Those who endorse PLEs are more likely to rate their mental health as "fair" or "poor" in comparison to those without (Lewis-Fernández et al., 2009), and PLEs have been found to negatively impact functioning (Armando et al., 2010, 2012; Oh, Koyanagi, Kelleher, & DeVylder, 2018; Yung et al., 2006, 2009). Considering these potentially unfavorable outcomes, connecting people who have distressing PLEs to mental health services (MHS) could have important public health implications.

A recent meta-analysis and systematic review of self-reported PLEs and MHS use in general population samples reported that those who endorsed PLEs were almost twice as likely to endorse MHS utilization than individuals who did not (Bhavsar et al., 2018). There is evidence of potential unmet need among individuals in the general population who report PLEs, as DeVylder and colleagues (2014) reported that 30% of a general population sample who endorsed PLEs had used MHS in the 12-months prior. Factors such as the frequency and types of PLEs endorsed may be relevant to understanding the nuanced nature of service use in people with PLEs. In a New Zealand national survey, Gale and colleagues (2011) reported that lifetime utilization of MHS significantly increased with increasing PLEs. Specific PLEs may be more associated with service use than others, as thought control, paranoia, and "strange experiences"

have been associated with a two-to-three-fold increase in MHS utilization (Murphy et al., 2012). In an unrelated study, endorsement of persecutory ideas was significantly associated with help-seeking behaviors (Armando et al., 2012).

An area of service utilization research among those with PLEs that has received less attention is perceived need for and intent to seek care. Assessing perceived need and intent to seek treatment may be important in more accurately identifying clinically relevant PLEs, in addition to providing an opportunity to examine the very earliest stages of PLEs transitioning from common mental health phenomena to mental health concerns. In a nationally representative general sample of US adults, DeVylder and colleagues noted that adults with PLEs were significantly more likely to endorse a self-perceived need for MHS and to have been encouraged by others to utilize services compared to those without PLEs (DeVylder et al., 2014). In another study, auditory disturbance PLEs were significantly associated with self-perceived need for treatment while accounting for symptoms of anxiety, depression, and neuroticism (Demmin et al., 2017). Although perceived need for services and intent to seek treatment are similar, we suggest that intent to seek treatment conveys unique information beyond perceived need. Because the process of service utilization likely occurs over many stages (Mojtabai et al., 2002), it is possible that the realization that one may benefit from MHS (perceived need) precedes the development of intention to seek care. There is conflicting evidence regarding the relation between intention to seek care and actual help-seeking behaviors, with some studies reporting positive associations (Tomczyk et al., 2020), and others reporting null findings (Chin et al., 2015) among young people experiencing a variety of mental health concerns**.** Identifying young people who experience PLEs and report an intent to seek treatment may facilitate the fields' understanding of the transition from intention to behavior.

Elucidating the link between PLEs and intention to seek treatment can offer important insight into the trajectory of experiences that begin as non-problematic and progress towards psychopathology, providing clues as to when to encourage treatment and potentially improving rates of service utilization. The present study sought to examine the relations between PLEs and intent to seek mental health treatment within the context of other symptomatology (i.e., anxiety and depression) in a community sample of non-help-seeking young people. Additionally, we aimed to identify specific types of PLEs that may be associated with intent to seek treatment. Finally, we sought to explore the association between distress related to PLEs and intent to seek treatment. We hypothesized that higher PLE scores and higher PLE distress scores would predict stronger (i.e., higher) intent to seek mental health treatment. Additionally, we explored whether this influence would hold when controlling for ratings of anxiety and depression.

2. Methods

2.1 Recruitment and Sample Characteristics

Participants in this multi-site study of general community mental health experiences, the Multisite Assessment of Psychosis-Risk (MAP study, $N = 3{,}234$), were recruited from the surrounding regions of three sites: Temple University (Philadelphia, PA), Northwestern University (Chicago, IL), and University of Maryland, Baltimore County (Baltimore, MD). The larger MAP study aims to improve psychosis-risk identification and evaluation within the general population. Two participants were removed for outlier responses on the PRIME based on visual inspection, and remaining participants between the ages of 16 and 30 years old were selected for analysis if not receiving MHS at the time of participation ($n_{analysis} = 2{,}529$). Recruitment was conducted via community outreach, flyers, and online sources such as social media advertisements and craigslist. Participants were in their early 20s, majority female, and

largely identified as White, Asian, or Black/African American (see Table 1 for detailed descriptive characteristics of the analysis sample). Thirty-five percent of the sample reported an annual household income of less than $50,000, and 35% reported an annual income of $100,000 and over.

2.2 Study Procedures

Data was collected from October 2017 to February 2020 through a Qualtrics survey that took 45 minutes to 1 hour to complete. Prior to data collection, participants (or their legal guardians for minor participants) were required to read and sign an online informed consent form and an online assent form, when applicable. Participants were required to answer all items, but each item included a "Prefer not to respond" option. Participants were compensated with a $10 Amazon gift card (or course credit based on study recruitment method). All study procedures were approved by the Institutional Review Boards (IRB) of Temple University, Northwestern University and University of Maryland, Baltimore County.

2.3 Tools and measures

2.3.1 PRIME Screen

The PRIME Screen is a self-report tool that assesses the presence of psychosis-risk symptoms in the past year (Miller et al., 2004) that has demonstrated psychometric reliability and validity with interview diagnosis of psychosis-risk (Kline et al., 2012). The PRIME Screen was designed to measure attenuated positive psychotic symptoms, however, in a non-clinical, community sample such as this one, it may tap into less severe PLEs. Participants completed the PRIME with Distress (*in preparation*), a modified version of the PRIME Screen that contains 12 Likert-type items with response options ranging from 0 ("definitely disagree") to 6 ("definitely agree") and were selected for analysis if they answered all PRIME items (i.e., not choosing

"prefer not to respond"). Items endorsed between 1 and 6 were followed by a probe asking participants to rate the degree of distress the experience causes them on an identical Likert-scale. Both total and individual PRIME item and PRIME distress scores were used in analyses.

2.3.2 Mental Health Service Utilization

Participants reported their intent to seek treatment by responding to a five-point (1 "Not at all" to 5 "Very Much") Likert scale item asking participants "Please indicate how strongly you are considering seeking some type of mental health care by selecting a number below:".

2.3.3 Center for Epidemiologic Studies - Depression Scale (CES-D)

The CES-D is a 20-item self-report assessment measure of depressive symptoms over the past week (Radloff, 1977). A 14-item version with scores of $\geq$ 10 representing likelihood of clinically-relevant depressive symptoms was used in the present study (Andresen et al., 1994).

2.3.4 State-Trait Anxiety Inventory (STAI)

The STAI is a brief, self-report assessment of anxiety symptoms (Spielberger, 1983). To address issues regarding multicollinearity, a 7-item version that excludes items that strongly overlap with measures of depression and may not strictly assess anxiety was used (Bieling et al., 1998; Spielberger, 1983). Total scores range from 7-28, and a score of $\geq$ 16 suggests the respondent likely meets diagnostic criteria for an anxiety disorder (Bieling et al., 1998).

3. Results

3.1 PRIME Total, CES-D, STAI, and Intent to Seek Treatment

A multiple linear regression was run to predict intent to seek treatment from total PRIME, CES-D and STAI scores. The overall model significantly predicted intent to seek treatment, $F(3, 2432) = 252.66$, $p < .001$, predicting 24% of the variance. The effect size, as measured by Cohen's f^2, was $f^2 = 0.31$ (95% CI [0.26, 0.36]), indicating a medium-large effect

(Cohen, 1988). Depression, anxiety and total PLEs scores independently predicted intent to seek treatment (all *p*s < .05; Table 2).

3.2 PRIME Items, CES-D, STAI, and Intent to Seek Treatment

A second multiple linear regression was run with all 12 PRIME items, CES-D and STAI scores as predictors of intent to seek treatment. The CES-D and STAI remained significant predictors. The positive association between PLEs and intent to seek treatment was significant with PRIME items 5 ("I think that I may get confused at times whether something I experience or perceive may be real or may be just part of my imagination or dreams.") and 12 ("I have been concerned that I might be 'going crazy.'"), such that higher ratings on these items were associated with higher intent to seek treatment. PRIME item 9 ("I think I might feel like my mind is 'playing tricks' on me.") was negatively predictive of intent to seek treatment (Figure 1A, Table 2). The remaining nine PRIME items were not significant.

3.3 PRIME Distress Total, CES-D, STAI, and Intent to Seek Treatment

A third multiple linear regression was conducted to predict intent to seek treatment from total PRIME distress, CES-D and STAI scores. The overall model significantly predicted intent to seek treatment, $F(3, 2432) = 254.45$, $p < .001$, and predicted 24% of the variance with a medium-large effect size, $f^2 = 0.31$ (95% CI [0.26, 0.36]). Depression, anxiety, and total PLE distress independently predicted intent to seek treatment (all *p*s < .05; Table 3).

3.4 PRIME Distress Items, CES-D, STAI and Intent to Seek Treatment

Finally, a multiple linear regression was run to predict intent to seek treatment from all 12 PRIME item distress ratings, CES-D and STAI scores. The positive relation between PLE-associated distress and intent to seek treatment was driven by distress ratings on item 12 ("I have been concerned that I might be 'going crazy.'"), such that higher distress on this item was

predictive of higher intent to seek treatment. Distress ratings on item 1 ("I think that I have felt that there are odd or unusual things going on that I can't explain.") was very nearly positively significant ($p = .06$). Distress ratings on items 4 ("I have had the experience of doing something differently because of my superstitions.") and 10 ("I have had the experience of hearing faint or clear sounds of people or a person mumbling or talking when there is no one near me.") were negatively associated (all ps < .05; Figure 1B, Table 3). The remaining nine PRIME distress items were non-significant.

All VIF and tolerance values of the independent variables were in the acceptable range (i.e., VIF < 10.0, tolerance > 0.10). Findings remained significant when age, race and biological sex were included in the regressions as covariates (results available upon request). Though PRIME item and distress total scores were not normally distributed, to maintain the original data structure, non-transformed scores were used. However, the pattern of results and statistical significance remained the same after log-transformation of the PRIME item and distress total scores.

4. Discussion

This is the first study to suggest that PLEs (as measured by the PRIME), depression and anxiety are independently associated with intent to seek mental health treatment in a general community sample of adolescents and young adults. Feeling as if one might be "going crazy" and confusion about whether things are occurring in reality, imagination or dreams were the two most positively significant PRIME items, while feeling one's mind is playing tricks was inversely predictive. The findings for PLE distress were similar, with PRIME distress predicting intent to seek treatment when controlling for ratings of depression and anxiety. Again, distress around feeling as if one might be "going crazy" was the most positively predictive item, while

distress about experiencing voices and changing behavior due to superstitions were inversely predictive of intent to seek treatment. These results suggest not only that the PRIME uniquely contributes to treatment-seeking intentions independently from more common mental health concerns (i.e., anxiety and depression), but that specific PRIME items appear more closely associated than others in leading young people to consider seeking mental health treatment.

Although statistically significant even after controlling for depression and anxiety, the two PRIME items of "going crazy" and confusion about reality had relatively small effect sizes, and the clinical implications of these significant findings should be weighed in context. Relative to other mental health concerns (e.g., depression), these items are reliable, but not strong, predictors of intent to seek care. Item 12, feeling like one is "going crazy," may capture both PLE and non-PLE phenomena for participants. Some participants may have endorsed it in response to general mental health concerns unrelated to psychosis (e.g., "I'm so depressed and anxious, I feel like I'm going crazy"). Consistent with this hypothesis, item 12 was significantly correlated with the STAI and CES-D. Others, however, may have connected the adjective "crazy" from this item to the psychosis spectrum, representing a specific PLE that they fear could portend future mental health deterioration. The fact that this item was administered in the context of 11 preceding psychosis-risk items and that it correlated with all other PRIME items lends credibility to this notion (Supplementary Table 1). An additional PRIME sum score without item 12 was calculated and entered into a regression predicting intent to seek treatment with anxiety and depression scores as covariates. The overall regression model was significant, as was the 11-item PRIME sum score (Supplementary Table 2), suggesting that even without the most predictive item of the PRIME, PLEs are accounting for a significant portion of the variance in intent to seek treatment ratings. In a qualitative study of the subjective experiences of young

people at clinical high risk for psychosis, feeling as if one was “going crazy” was a commonly reported theme, suggesting that for those at risk for psychosis, this belief may represent an important clinical factor (Ben-David et al., 2014). Item 5, confusion about reality vs. imagination or dreams, may suggest an early form of impaired reality testing, which has been proposed as a key factor in models of hallucinations in schizophrenia (Mintz & Alpert, 1972) and in animal models of schizophrenia (McDannald et al., 2011). As the field moves towards developing shorter, more clinically efficient psychosis screening tools (Phalen et al., 2018), these two items may be especially important when assessing degree of consideration of care.

It has been estimated that up to 90% of PLEs reported by young people are transitory and may not reflect elevated risk for psychosis unless the experiences become persistent or impairing (van Os et al., 2009). In line with how common PLEs are, not all items were positively associated with intent to seek treatment. The inverse link between one’s mind “playing tricks" and intention to seek treatment may be due to participants interpreting this item as a relatively normative experience of momentary sensory ambiguity. For example, a mind trick might be seeing something flash out of the corner of one’s eye and may be categorized as a typical initial misinterpretation in the visual field that is quickly interpreted as inert, an overactive imagination, or simply a brief cognitive distortion. Particularly when low in frequency, conviction, and distress, people who endorse the mind “playing tricks” item relative to the other PLEs report lower intention to seek treatment.

Similarly, several items in the analyses considering PLE distress were inversely related to intention to seek help. Specifically, distress regarding items 4 (doing things differently because of superstitions) and 10 (hearing voices) were negatively associated with intent to seek treatment. Feeling distress as a result of one’s superstitions may not be interpreted as a mental health

concern, or something that could be addressed through MHS, which may explain why this item was negatively associated with intent to seek treatment. Although a negative relation between distress from hearing voices and treatment consideration may seem counterintuitive, it is possible that stigma may be influencing this association. Psychosis remains one of the most stigmatized forms of mental illness (Pescosolido et al., 2019; Wood et al., 2014), and auditory hallucinations are arguably the most commonly recognized symptom of psychotic disorders, conceivably leaving individuals more reluctant to consider seeking treatment (Gronholm et al., 2017).

4.1 Limitations and Future Directions

The current sample was predominantly female identifying and enrolled in college, which may limit generalizability. Given the cross-sectional design of the study, longitudinal examinations of intent to seek treatment and actual rates of service utilization over time are warranted. As there is no gold-standard or validated measure of intent to seek in the context of risk for psychosis, we used a non-validated (albeit with strong face validity) item intended to measure of intent to seek treatment. This single item may not allow for a nuanced understanding of intent to seek treatment; future work should consider using multi-item assessments of intent to seek care.

5. Conclusions

Findings suggest that the PRIME screen influences consideration of seeking treatment among older adolescents and young adults, independent of more common symptomatology of depression and anxiety. Certain PRIME items, such as feeling as if one is “going crazy” or experiencing confusion about reality, emerged as significant and positively influencing intent to seek treatment. Distress associated with other experiences, such as hearing voices or changes in behavior due to superstitions were negatively associated with considering treatment. These

results provide the groundwork for developing more comprehensive assessment of treatment-seeking decisions and intentions, barriers and beliefs about mental health treatment, and service utilization, in addition to providing evidence of unmet clinical need among some young people endorsing PLEs.

Conflict of interest

The authors have no conflicts of interest to report.

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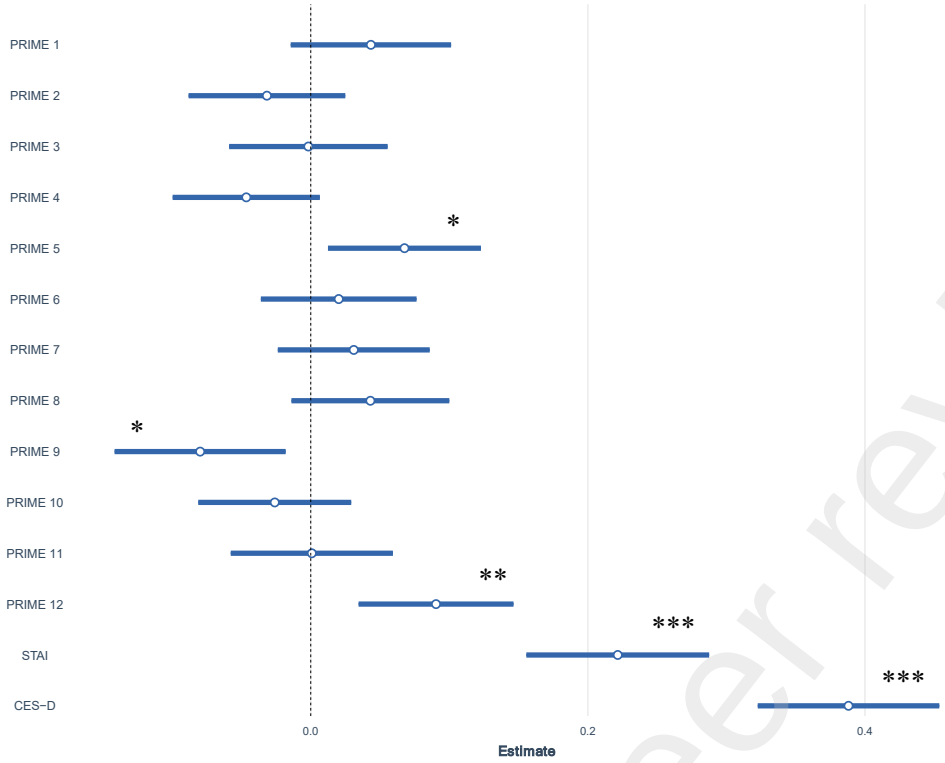
Table 1: Descriptive characteristics of the analysis sample.

	$n_{analysis}$ = 2529	**Missing** (n, %)
Age (Mean, SD)	20.26 (2.27)	6, <1%
Sex (% Female)	67%	14, <1%
Race (%)		92, 4%
American Indian/Alaska Native	<1%	
Asian	28%	
Black/African American	15%	
More than one race	6%	
Native Hawaiian or other Pacific Islander	<1%	
White	50%	
Ethnicity (% Hispanic or Latino)	10%	43, 2%
PRIME Total Score (Mean, SD)	6.63 (10.83)	0
PRIME Total Distress Score (Mean, SD)	5.44 (10.54)	0
CES-D Total Score (Mean, SD)	13.24 (7.86)	56, 2%
STAI Total Score (Mean, SD)	13.41 (5.09)	13, <1%

Table 2: Multiple linear regression predicting intent to seek treatment from all 12 PRIME item ratings

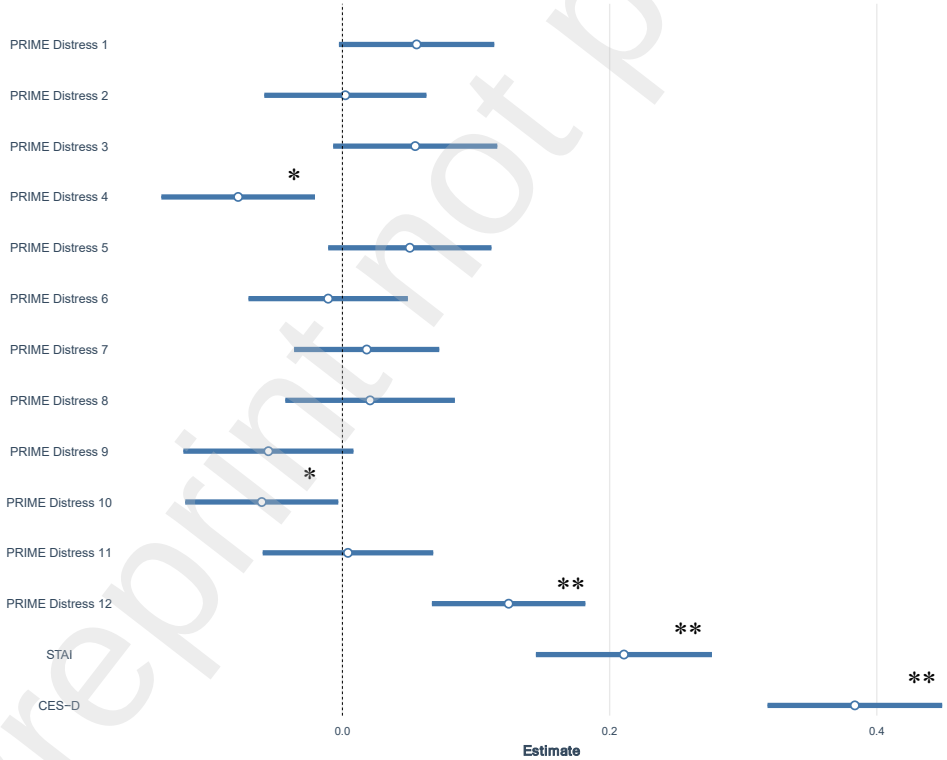
	Standardized β	*t*	*p*	Partial *r*	Semi-partial *r*
Model 1					
PRIME sum score	**.056**	**2.97**	**.003**	**.060**	**.053**
CES-D total score	**.319**	**12.03**	**<.001**	**.237**	**.213**
STAI total score	**.173**	**6.57**	**<.001**	**.132**	**.116**
Model 2					
PRIME 1: odd/unusual things	.035	1.47	.142	.030	.026
PRIME 2: predict the future	-.025	-1.10	.273	-.022	-.019
PRIME 3: something controlling thoughts/feelings/actions	-.001	-0.06	.953	-.001	-.001
PRIME 4: doing things differently because of superstitions	-.037	-1.72	.086	-.035	-.030
PRIME 5: confused about reality	**.054**	**2.40**	**.016**	**.049**	**.042**
PRIME 6: mind reading	.016	0.70	.482	.014	.012
PRIME 7: wondering if people may hurt me	.025	1.11	.267	.023	.020
PRIME 8: supernatural gifts/talents	.034	1.48	.139	.030	.026
PRIME 9: mind "playing tricks"	**-.064**	**-2.54**	**.011**	**-.051**	**-.045**
PRIME 10: hearing voices	-.021	-0.92	.356	-.019	-.016
PRIME 11: thoughts out loud	.001	0.03	.979	.001	<.001
PRIME 12: "going crazy"	**.072**	**3.170**	**.002**	**.064**	**.056**

Figure 1A



* $p < .05$, ** $p = .001$, *** $p < .001$

Figure 1B



* $p < .05$, ** $p < .001$

Table 3: Multiple linear regression predicting intent to seek treatment from all 12 PRIME item distress ratings

	Standardized β	*t*	*p*	Partial *r*	Part *r*
Model 3					
PRIME distress score	**.069**	**3.59**	**<.001**	**.073**	**.064**
CES-D total score	**.316**	**11.90**	**<.001**	**.235**	**.211**
STAI total score	**.172**	**6.44**	**<.001**	**.129**	**.114**
Model 4					
PRIME Distress Item 1: odd/unusual things	.044	1.87	.06	.038	.033
PRIME Distress Item 2: predict the future	.002	0.70	.94	.001	.001
PRIME Distress Item 3: something controlling thoughts/feelings/actions	.044	1.74	.08	.035	.031
PRIME Distress Item 4: doing things differently because of superstitions	**-.062**	**-2.66**	**.008**	**-.054**	**-.047**
PRIME Distress Item 5: confused about reality	.040	1.62	.11	.033	.028
PRIME Distress Item 6: mind reading	-.009	-0.35	.73	-.007	-.006
PRIME Distress Item 7: wondering if people may hurt me	.015	0.65	.51	.013	.012
PRIME Distress Item 8: supernatural gifts/talents	.017	0.64	.52	.013	.011
PRIME Distress Item 9: mind “playing tricks”	-.044	-1.71	.09	-.035	-.030
PRIME Distress Item 10: hearing voices	**-.048**	**-2.07**	**.04**	**-.042**	**-.036**
PRIME Distress Item 11: thoughts out loud	.003	.126	.89	.003	.002
PRIME Distress Item 12: “going crazy”	**.100**	**4.28**	**<.001**	**.086**	**.075**

Supplementary Table 1: Correlation matrix between all 12 PRIME items, PRIME Sum, CES-D and STAI total scores.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PRIME Item 1 [1]	--	.477**	.473**	.449**	.466**	.405**	.423**	.422**	.522**	.373**	.372**	.423**	.182**	.731**	.253**	.269**
PRIME Item 2 [2]		--	.414**	.410**	.341**	.442**	.364**	.556**	.352**	.299**	.340**	.313**	.094**	.644**	.137**	.147**
PRIME Item 3 [3]			--	.410**	.441**	.470**	.456**	.410**	.497**	.401**	.477**	.434**	.149**	.709**	.206**	.240**
PRIME Item 4 [4]				--	.401**	.403**	.369**	.378**	.446**	.286**	.343**	.313**	.097**	.654**	.172**	.216**
PRIME Item 5 [5]					--	.400**	.410**	.360**	.542**	.391**	.427**	.413**	.173**	.698**	.217**	.225**
PRIME Item 6 [6]						--	.445**	.465**	.435**	.425**	.468**	.393**	.134**	.688**	.162**	.177**
PRIME Item 7 [7]							--	.401**	.495**	.400**	.421**	.419**	.177**	.683**	.249**	.268**
PRIME Item 8 [8]								--	.392**	.375**	.410**	.347**	.092**	.660**	.092**	.097**
PRIME Item 9 [9]									--	.441**	.479**	.529**	.162**	.759**	.270**	.291**
PRIME Item 10 [10]										--	.551**	.405**	.122**	.627**	.193**	.191**
PRIME Item 11 [11]											--	.455**	.123**	.674**	.163**	.183**
PRIME Item 12 [12]												--	.244**	.663**	.331**	.335**
Intent to Seek Treatment [13]													--	.216**	.470**	.432**
PRIME Sum [14]														--	.304**	.329**
CES-D Total [15]															--	.742**
STAI Total [16]																--

** $p < .001$

Note - Values indicate Pearson's *r*

Supplementary Table 2: Multiple linear regression predicting intent to seek treatment from 11-item PRIME Sum Score (calculated without Item 12 "going crazy")

	Standardized β	*t*	*p*	Partial *r*	Semi-partial *r*
PRIME sum score	.050	2.67	.008	.054	.047
CES-D total score	.321	12.10	<.001	.238	.118
STAI total score	.178	6.64	<.001	.133	.214

$F(3, 2432) = 251.92$, $p < .001$, $R^2 = .24$

Figure Captions

Figure 1A: Plot of coefficient estimates and 95% confidence intervals for predictors in a multiple linear regression (PRIME items 1-12 predicting intent to seek mental health treatment)

Figure 1B: Plot of coefficient estimates and 95% confidence intervals for predictors in a multiple linear regression (PRIME *Distress* items 1-12 predicting intent to seek mental health treatment)

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