Is there a predictive association between methamphetamine use and depression?

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Background

People dependent on methamphetamine have an elevated rates of depression compared to people who are not. Understanding the relationship between methamphetamine use and depression is necessary to develop effective public health and treatment interventions.

3 potential pathways have been proposed to understand this relationship:
- Methamphetamine use causes depression
- Depression causes methamphetamine use
- There is no direct causal link (e.g., the co-occurrence is coincidental and unrelated)

However, there is a lack of longitudinal studies to understand the temporal relationship between methamphetamine use and depression

Aims

Using a longitudinal cohort of people dependent on methamphetamine:

To examine the temporal relationship between methamphetamine use and depression
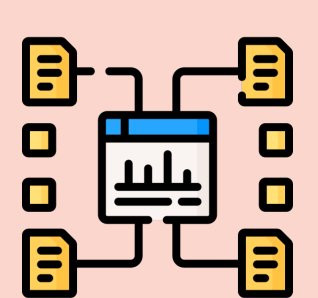
Methods

153 people dependent on methamphetamine and included in the N-ICE trial

12 contiguous weeks of follow-up, including measures of:
Methamphetamine use in the past week, using Timeline Followback (TLFB)
Depression in the past week as identified through the depression score ≥4 on the Brief Psychiatric Rating Scale (BPRS)

Random-intercept cross-lag panel modelling (RI-CLPM) analysis was conducted.

- ⊕ Able to separate the between- and within-persons components

- ⊕ Model included covariates identified through logistic regressions between baseline characteristics and outcomes

- ⊕ Examines what happens in the following week if an individual increases their average methamphetamine use or likelihood of depression in the current week
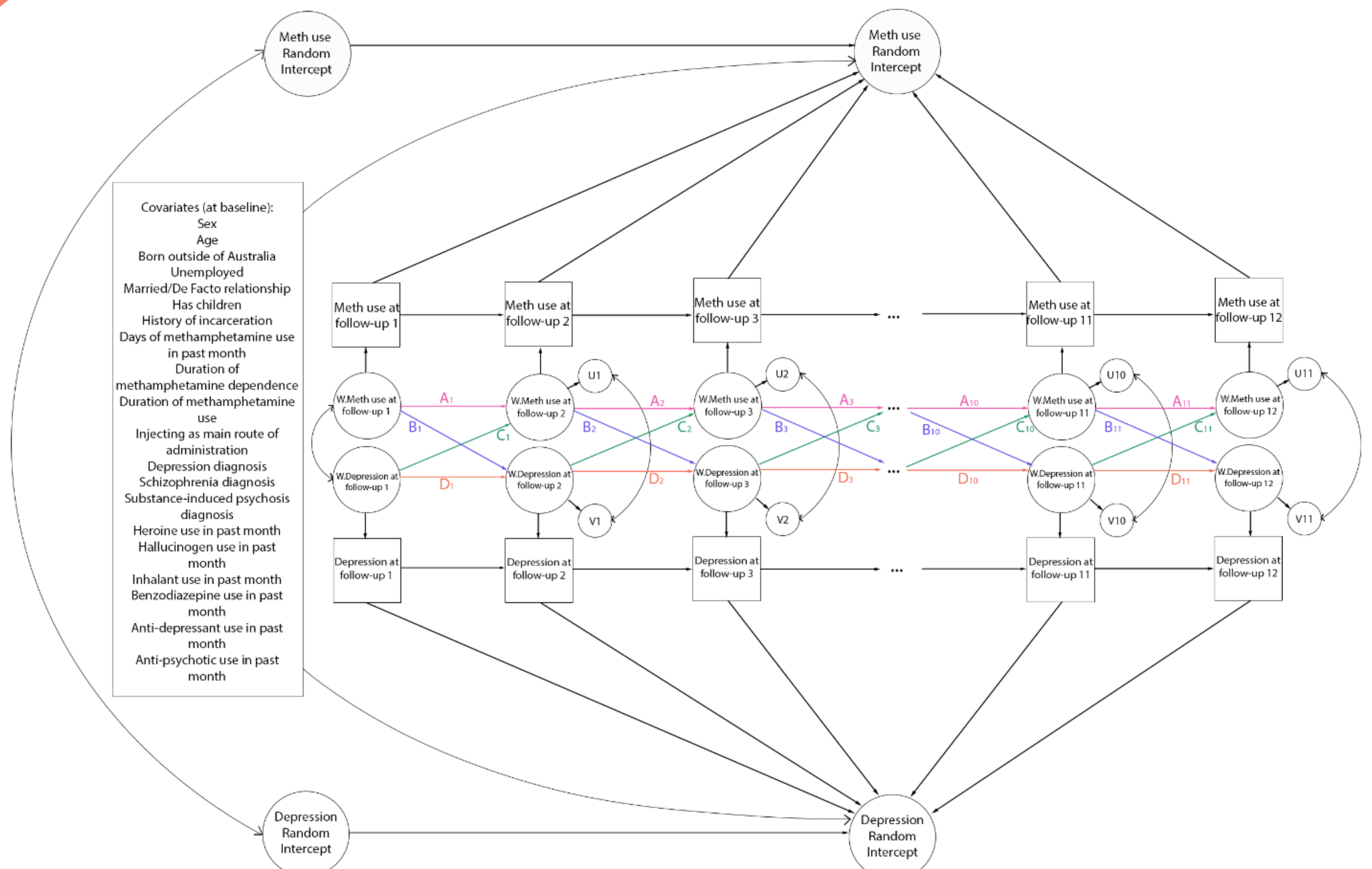
Visual Model

Figure 1. Visual representation of the full random intercept cross-lagged panel model (RI-CLPM) for methamphetamine use and depression.
Note: W.Meth use and W.Depression represent the within-person fluctuations; U_{t-1} and V_{t-1} denote the respective within-person residuals with t indicating follow-up week; '…' denotes that the model components are repeated for follow-ups 4 to 10.

Results

Averaged across all weeks of follow-up, the model found that relative to one's average:

⬆ If an individual increases their methamphetamine use in one week, this is associated with increased probability of depression (B) and methamphetamine use (A) in the following week

⬆ If an individual increases their probability of depression in one week, this is associated with increased methamphetamine use (C) and probability of depression (D) the following week
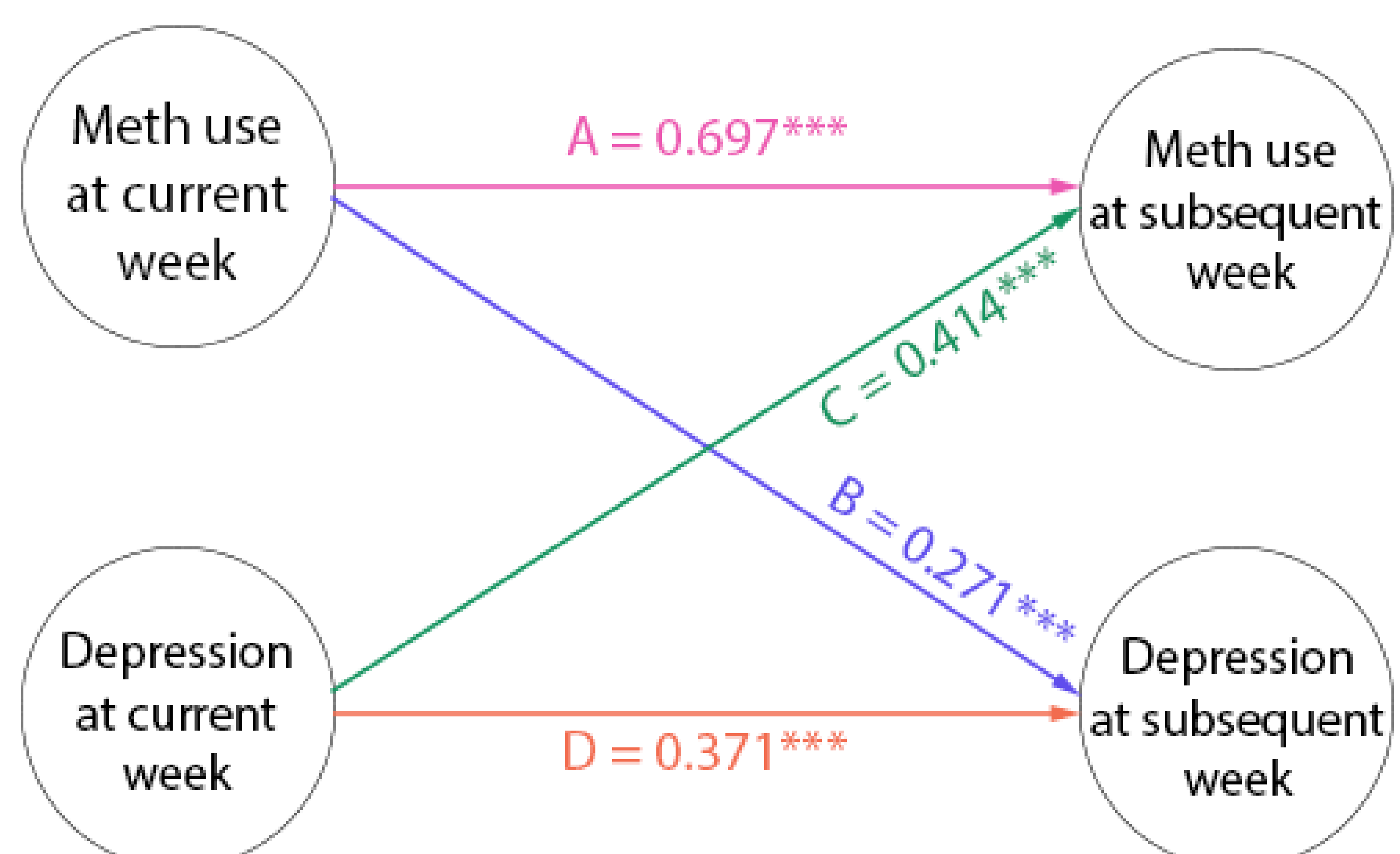

Figure 2. Visual representation of RI-CLPM for methamphetamine use and depression averaged across all follow-ups; *** denotes p <.001

Conclusions

⚠ There is a significant cross-lag bidirectional predictive association between methamphetamine use and depression

⚠ Results support the proposals that there is a causal link between methamphetamine use and depression (i.e., co-occurrence of methamphetamine use and depression is not coincidental)

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