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Latent class analyses on attendance of toddler safety promotion intervention

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Objective: Little is known about the association between maternal depressive symptoms and attendance at safety promotion interventions. This study used latent class analysis (LCA) to identify the profile of attendance within a toddler safety intervention and assessed its relation with maternal depressive symptoms at baseline and reduction of home safety problems over time, separately.

Methods: The analytic sample included 91 mothers of toddlers (mean maternal age 28.16 years) who were assigned to the safety promotion intervention group as part of a randomized trial and assessed at baseline, 6-month and 12-month follow-ups. Using LCA, we classified mothers into low and high attendance classes based on their attendance at 8 intervention sessions. We assessed maternal depressive symptoms with the Beck Depression Inventory (BDI) and home safety problems with a 9-item home safety problem observation.

Results: The mothers were classified into low attendance (45%) and high attendance classes (55%). The posterior probability of attending each session ranged from 0-0.29 for the low attendance class and 0.68-0.92 for the high attendance class. Each one unit increase of BDI summary score at baseline was associated with an 8% reduced likelihood of being in the high attendance class (aOR=0.92, 95% CI: 0.86-1.00, p=0.037). The home safety problem score reduction was greater among high attendance class participants than low attendance class participants at the 6-month follow-up (b=-1.15, SE=0.48, p=0.018).

Conclusion: Maternal depressive symptoms reduced the probability of maternal attendance at toddler safety promotion sessions; high session attendance was related to greater reduction of toddler home safety problems. Identifying risk factors for maternal low attendance to interventions and developing strategies to promote attendance should lead to reductions in home safety problems and reductions in unintentional injuries among young children.

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1 Purpose:

1. To assess the patterns of attendance among the mother-toddler dyads who participated in a randomized toddler safety promotion intervention trial and were assigned to the safety promotion group based on latent class analyses.
2. To assess the latent class membership of attendance in relation to baseline depressive symptoms.
3. To assess the latent class membership in relation to reduction of home safety problems over time

Target variables:

Attendance for each of the 8 safety promotion intervention sessions (yes vs. no)

Maternal depressive symptoms at baseline

Home safety problems at baseline, 6-month and 12-month follow ups.

2 Inclusion criteria

A subsample of those who were assigned to safety promotion intervention group (n=91) out of the sample of all the mother-toddler dyads who participated in the a randomized toddler safety promotion intervention trial (n=277). For the mother-toddler dyads who participated in

the intervention trial, the inclusion criteria are listed below: Inclusion criteria for mothers: age >18 years and not pregnant; for children: age 12–32 months, term birth, birth weight >2500 g, independent ambulation and no congenital or disabling conditions.

3 Exclusion criteria: The mother-toddler dyads who were assigned to the attention control group.

4 Study design

Longitudinal with three assessments: baseline, 6-month follow up and 12-month follow up.

5 Study participation and registration

(1) The safety promotion prevention intervention trial (and also called the Toddler Overweight Prevention Study among low-income families since the attention control group received the obesity prevention) has been registered with the Clinical Trials Registry (NCT02615158).

(2) The University of Maryland Baltimore Institutional Review Board approved this research;

(3) All mothers provided written consent.

6 Surveys / Questionnaires

Data on socio-demographic characteristics, depressive symptoms were reported by the mothers and the home safety problems were observed by the research assistants.

7 Measures

1. Attendance: Health educators recorded the participants' attendance at each of the 5 in-person group sessions and in each of the 3 phone calls (1=yes or 0=no).

2. Maternal depressive symptoms: Maternal depressive symptoms were measured at baseline with the Beck Depression Inventory (BDI)[11]. The BDI includes 21 questions relating to depressive symptoms in the past week, e.g., sadness and feeling guilty, using a 4-point Likert scale ranging from 0 to 3. We calculated a summary score, with higher scores indicating more symptoms. Cronbach's alpha was 0.91 in this study, indicating a good internal consistency.

3. Home safety problems: We assessed home safety problems at baseline, before the intervention, and at 6- and 12-months after baseline. The summary score was created based on nine items with 1=yes/0=no responses: (1) exposed wires; (2) covered outlets; (3) working smoke detector on each floor; (4) stair gate for toddlers in homes with stairs; (5) dangerous balcony/porch; (6) unsafe outside handrails/steps/stairs; (7) chipped/peeled paint; (8) peeling paint/broken plaster >8 1/2 by 11 inches and (9) child-resistant latches on cleaning supply/medication cabinets [8]. The summary score ranges from 0 to 9, with a high score indicating more safety problems.

8 Analysis

1. Latent class analyses to identify the different pattern in the attendance of safety promotion intervention.

2. Logistic regression (or multinomial logistic regression) to assess the baseline predictors of latent class membership.
3. Linear mixed model to assess the difference in the reduction of home safety problems over time between the two classes.