Preventing Maternal Depression, Intimate Partner Violence, and Substance Use during Nurse Home Visiting Augmented with Relationship Education

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Introduction

❖ Maternal Depression (MD), Intimate Partner Violence (IPV), Substance Use (SU) are common and co-occurring with profound impacts on mothers and newborns.

❖ A few teams addressed them in home visiting (HV).[1-5]

❖ As a service delivery model, Nurse Family Partnership (NFP) program is transforming its community practice.[6]

❖ Although relationship education (RE)[7-8] reduced IPV & distress, HV programs lacks a comprehensive RE model.

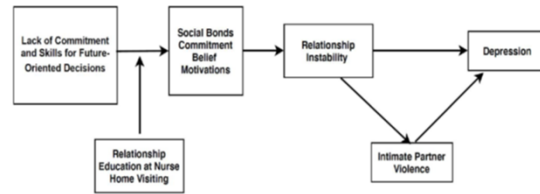❖ We examined the effects of NFP augmented with RE to prevent three outcomes & related mechanisms (Figure).

Methods

❖ Study Design: Secondary analysis of an RCT of the NFP program in Oregon augmented with IPV screening, referrals, and the *Within My Reach* Curriculum,[8] delivered by nurses, 2007-2010.[1,9-10]

❖ 238 pregnant mothers were interviewed by research assistants at baseline, 1- and 2-year follow-up, using the Edinburgh Depression Inventory, the Alcohol Use Disorder Identification Test and Drug Abuse Screening Test, and the Revised Conflict Tactics Scale.[1]

❖ For count outcomes of MD, IPV, and SU, Multilevel Zero-Inflated Negative Binomial Regression Models[11] and Mediation Analysis[12] were performed, adjusting for age, race/ethnicity, education, and nativity.

Methods and Results

Figure. Proposed mechanisms of change on how relationship education affects intimate partner violence and maternal depression

Table 1. Maternal features and outcomes in the trial in Oregon, 2007 to 2010

	Control (N=103)	Augmented (N=135)	P value
Age	20.7 (4.7)	20.3 (4.0)	0.50
Race			
White	38 (36%)	32 (24%)	0.04*
Hispanic	44 (42%)	75 (56%)	0.03*
Others	22 (21%)	26 (20%)	0.79
Missing	1 (1%)	0	
U.S.-born	66 (63%)	71 (53%)	0.14
High school graduate	56 (54%)	71 (59%)	0.02*
Annual household income			
<$20,000	60 (58%)	61 (47%)	0.10
Missing	2 (2%)	4 (3%)	
Employed	63 (62%)	65 (50%)	0.07
Missing	4 (4%)	4 (4%)	
Partner Relationship			
Married or engaged	34 (47%)	31 (38%)	0.27
Missing	32 (30%)	26 (20%)	
	N, Mean, SD, Variance		
	638, 6.6, 5.9, 34.3		
Maternal depression			
Baseline	105, 7.5, 6.0, 35.5	133, 6.4, 5.8, 34.0	0.15
Year 1	93, 7.0, 6.0, 35.9	116, 5.3, 5.5, 30.4	0.04*
Year 2	86, 7.3, 5.7, 33.0	105, 6.6, 6.0, 35.8	0.46
	638, 2.8, 4.8, 23.2		
Intimate partner violence			
Baseline	102, 3.1, 4.6, 21.0	132, 2.2, 3.7, 13.5	0.07
Year 1	93, 3.6, 5.6, 31.9	116, 2.4, 4.8, 23.1	0.10
Year 2	85, 3.2, 5.3, 28.0	105, 2.6, 5.0, 25.1	0.44
	638, 1.5, 3.0, 9.0		
Substance use			
Baseline	105, 1.7, 3.7, 13.6	133, 1.5, 3.1, 9.3	0.58
Year 1	93, 1.4, 2.7, 7.0	116, 1.3, 3.0, 8.7	0.85
Year 2	86, 2.0, 3.2, 10.3	105, 1.4, 2.3, 5.2	0.17

Notes: N: Number. SD: Standard Deviation. *p<0.05
*19%, 20 missing IPV reporting among 105 mothers in the control group at the 2-year follow-up

Table 2. Multilevel analyses Note: OR: Odds Ratio, RR: Rate Ratio; 95% CI: Confidence Interval

	Maternal depression			Intimate Partner Violence			Substance Use		
	Effect	95% CI Lower	95% CI Upper	Effect	95% CI Lower	95% CI Upper	Effect	95% CI Lower	95% CI Upper
Logit Submodel				**OR**			**OR**		
Intercept	0.24	0.02	2.32	8.06	0.45	143.94
wave	0.79	0.46	1.38	0.44**	0.24	0.81
Intervention	1.28	0.55	2.96	0.69	0.31	1.52
Wave x Intervention	0.44	0.15	1.27	1.59	0.82	3.11
Age, years	1.02	0.94	1.11	0.91	0.79	1.04
Foreign-born vs. U.S.-born	0.51	0.22	1.15	0.47	0.16	1.37
White vs Others	1.62	0.53	5.00	2.58	0.66	10.10
Hispanic vs Others	1.90	0.68	5.32	5.80**	1.02	32.90
High school graduate	1.33	0.61	2.97	0.65	0.27	1.55
Count Submodel	**RR**			**RR**			**RR**		
Intercept	7.38**	3.41	16.00	2.81	0.73	10.75	1.52	0.23	10.04
Wave	1.00	0.89	1.11	1.07	0.95	1.20	0.88	0.55	1.42
Intervention	0.78	0.60	1.03	0.58*	0.37	0.90	1.04	0.59	1.84
Wave x Intervention	1.01	0.87	1.18	0.93	0.69	1.26	0.94	0.69	1.27
Age, years	0.96	0.91	1.02	0.99	0.91	1.08	0.99	0.91	1.08
U.S.-born vs Foreign-born	1.27	0.92	1.75	2.33**	1.36	4.00	1.91	0.80	4.55
White vs Others	0.91	0.65	1.27	0.73	0.42	1.25	1.28	0.69	2.38
Hispanic vs Others	0.81	0.58	1.14	0.92	0.54	1.57	0.99	0.36	2.70
High school graduate	1.01	0.76	1.33	0.98	0.61	1.57	0.86	0.42	1.76
Variance of the intercepts across the participants	2.27**	1.95	2.64	2.28**	1.34	3.86	2.70**	1.37	5.32
Covariance between the intercepts and slopes	0.92	0.81	1.04	1.26*	1.04	1.54	1.01	0.63	1.60
Variance of the slopes of waves across participants	1.28**	1.11	1.48	1.15	0.95	1.40	0.93	0.24	3.56
Dispersion parameter	1.22**	1.11	1.35	1.33**	1.09	1.61	1.22	0.99	1.51
Model fit AICC	3640.2			2429.8			1786.1		

Note: Among 714 observations across three time points, 82, 87, and 82 for maternal depression, intimate partner violence, and substance use were not included because of missing

Discussion

❖ IPV and SU did not differ between two groups at three waves. However, MD differed at 1-year follow-up.

❖ The augmented program did not reduce MD, IPV, or SU at the 1- or 2-year follow-up points. It affected MD at 2-year follow-up through IPV as a mediator at 1-year follow-up.

❖ Study strengths: Matching statistical modeling with distribution; Limitations: Small sample size, missing data.

❖ Large trans-disciplinary studies are needed to perform mediation analyses to delineate mechanisms of change and improve home visiting models to prevent MD, IPV, or SU.

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