2013

Empirical Evaluation of a Home Visiting Intervention Targeting Immigrant and Refugee Children

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A Thesis Submitted in Partial Fulfillment of the

Requirements for the Degree of

Masters of Arts

In

Clinical Psychology

Minnesota State University, Mankato

Mankato, Minnesota

May 2013

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What currently are known as home visiting programs can be traced back to England as early as the nineteenth century (Wasik & Bryant, 2001). Throughout history, home visiting programs have provided in-home services to many families, targeting outcomes such as: decreased subsequent pregnancies with increased spacing between each pregnancy, decreased number of visits to the emergency room, reduced quantity of verified child abuse and neglect, enhanced mother-child interaction, enhanced parenting skills, improved child development, and increased appropriate play with the child in the home (Schonberg et al., 1998).

Home visiting programs can vary significantly on factors such as duration of visits, length of program, and outcomes measured (Middlemiss & McGuigan, 2005). Many researchers have empirically examined the benefits that home visiting provides to the clients they serve (Middlemiss & McGuigan, 2005; Olds, Henderson, Chamberlin, & Tatelbaum, 1986; Olds et al., 2007; Raikes et al., 2006; Schwarz et al., 2012; Tuijil & Leseman, 2004); however, some studies have demonstrated a lack of positive outcomes (Kendrick et al., 2000; Ryan, 1976). Due to mixed results from research studies along with variability in programs, it is beneficial to examine each home visiting program and its outcomes separately.

Effectiveness of Home Visiting Programs

Many researchers have examined how home visiting programs can impact the development of children. This is an important facet to focus on considering that, nationally, only 17% of children 5 years or younger who have been identified has having developmental delays obtained services for those delays (Rosenberg, Zhang, & Robinson, 2008). Research has identified that parent-child interaction is crucial for the development of children; therefore, most

home visiting programs focus on improving the skills of parents to facilitate children's development (Peterson, Luze, Eshbaugh, Jeon & Kantz, 2007).

Home visiting has been shown to improve children's cognitive development. Smith and Gibbard (2011) found that children of parents who had been part of a home visiting program had a significantly larger vocabulary than children of parents who were not receiving services. The importance of this finding is emphasized by the research of Rescorla (2005) which identified that toddlers who are late to talk have more difficulties in school at age 13 than typically developing peers. Magill-Evans, Harrison, Benzies, Gierl, and Kimak (2007) concluded that the children of fathers who received educational information about effective ways to interact with their children at 5 and 6 months old showed more cognitive growth at 8 months old than those children of fathers who did not receive the educational information. Of children born to mothers with few psychological resources (e.g., lower IQ, mental health problems, and lower self-confidence), those who were part of a home visiting program showed higher grade-point averages and achievement test scores in grades 1 through 3 (Olds et al., 2007).

The impact of home visiting on children's cognitive development appears to be related to teaching parents effective ways to foster children's development through parent-child interaction. Raikes and colleague (2006) found that there was a robust relationship between the extent a home visiting program focuses on parent activities with their children and the outcomes. Specifically, child-centered activities in home visiting programs are more likely to produce results such as increased child cognitive language development and overall improved home environments compared to programs that focus on other family issues.

Impact of Demographic Factors on Effectiveness

Research has identified that the race of a child and the level of poverty in the family are associated with whether a child with developmental delays will receive services. More specifically, parents of non-Caucasian children and those with low socioeconomic status were not as likely to seek out services for their child's developmental delays (Rosenberg et al., 2008). This finding is concerning considering that low socioeconomic status (SES), a common factor in ethnic minority children, is associated with delayed development of language skills (Raviv, Kessenich, Frederick, 2004). However, these same researchers found that the parent-child interaction (i.e., maternal sensitivity and cognitive stimulation) was a partial mediator between SES and language development. Research by Tuijl and Leseman (2004) supports this mediation pathway. They also found that lower SES and ethnic minority parents, on average,were less sensitive-responsive to their children, utilized narrower vocabularies, conversed less frequently with their children, read less frequently to their children, used fewer open-ended questions, and engaged in less joint play with their children. Hence, this is a population that might be in particular need of effective home visiting services.

Relatedly, Middlemiss and McGuigan (2005) found that parents who were less acculturated (e.g., newer immigrants) benefited more from home visiting compared to those who were more acculturated. Research by Wagner and Clayton (1999) supports this finding. Schonberg and colleagues (1998) provided one explanation for the increased benefits that new immigrants receive from home visiting programs. It is argued that traditional pediatric care is based on the assumption that parents already possess the necessary knowledge and skills to facilitate development of their children. However, many immigrant parents lack the necessary parenting knowledge, due to lower socioeconomic status or lack of education in child

development, and also have an inadequate social support system (e.g., lack of extended family in the country or inability to communicate with professionals).

Although, there is research regarding the impact of immigrant status or ethnicity on developmental outcomes or the likelihood of seeking out services, there are no research studies that examine refugee populations. As refugees, the parents and children would display unique difficulties due to traumas faced by the war, which could add a greater impact on the developmental outcomes of the children.

Need for the Program under Evaluation

The ability of home visiting programs to foster cognitive development is particularly important in the current sample in the study as the percentage of children in this community entering kindergarten fully prepared has consistently remained around 50 percent or slightly above for the past few years (Kent, 2010). Within the kindergarten readiness report, Minnesota Department of Education (2011) identified a relationship between family's income, along with parent's education level, and the child's level of proficiency when entering kindergarten. The report also revealed that the largest readiness deficits were evident in ethnic minority children. This could indicate that newer immigrants in this community are in need of more support during their children's development and, therefore, should be the target population for home visiting programs.

Ready2Learn

Ready2Learn is a home visiting program developed by the YWCA as a way to facilitate development in children of immigrant and refugee families and help them be ready for kindergarten. This home visiting program centers the entire visit on the child and focuses solely on child development as an outcome variable. The overall assumptions behind the program is

that by monitoring and supporting the development in a population that research shows can benefit from services (e.g., newer immigrants and refugees), more children will be ready for kindergarten due to improving minor deficits before they significantly impact that child's life. Additionally, children who fall well below the developmentally appropriate cut-off score for any of the 5 domains are referred to professionals for additional assessment and intervention as needed.

Ready2Learn specifically helps children of immigrant and refugee families become ready for kindergarten by providing a volunteer home visitor who engages children and parents in developmentally appropriate activities. Every child of the families in this program between the ages 0 to 5 is assessed for developmental progress every 6 months through the Ages and Stages Questionnaire (ASQ; Squires, Bricker, & Potter, 1996). Each child is assessed on: Communication, Gross Motor, Fine Motor, Problem Solving, and Personal/Social. If any of those sub-scale scores falls below the cut-off, the home visitor educates the parents on activities suggested by the Ages and Stages Questionnaire materials to improve the child's development in the specific area of deficit and makes a referral to professionals for further assessment and/or intervention if the child's performance is significantly below typical development.

Hypotheses

This study aims to investigate the effectiveness of the home visiting program Ready2Learn in the Greater Mankato Area by demonstrating the outcomes on child development as measured by the ASQ. It is hypothesized that, on average, most children will begin the program with scores that are developmentally below the cutoff scores for their age range. It is also hypothesized that participation in this home visiting program will significantly increase the

percentage of children who meet developmental milestones as evidenced by scores on the ASQ increasing and migrating away from the clinically concerning area of scores.

Methods

Participants

Participants in this study are parents and children of immigrant and refugee families within a small metropolitan area. The families within this study are all Somali and Sudanese immigrants that come from a low socioeconomic status, many of whom came to the United States as refugees. Data were collected on the developmental outcomes of thirty-eight children. Of those thirty-eight initial participants, nineteen were female and seventeen were male. The gender was not reported for two of the participants. The ages of the participants are summarized in Table 1.

Table 1.
Summary of Ages of Participants for Initial Data Collection

Age	Frequency	Percent
Birth – 11 months	4	10.5
12 months – 23 months	10	26.3
24 months – 35 months	6	15.8
36 months – 47 months	6	15.8
48 months – 59 months	8	21.1
60 months	4	10.5

From the thirty-eight participants, the researchers were only able to collect data regarding the developmental outcomes of the children six months after the initial data collection for fifteen

of the participants. Lack of follow-up data for all participants can be attributed to a variety of reasons: four clients stopped their participation in the program, four of the participants were at 60 months for the initial data collection, and it has not been six months yet since the initial data collection for fifteen of the participants. Of the fifteen participants from whom researchers have obtained follow-up data, eight were girls and seven were boys. Table 2 displays the ages for the participants from whom researchers have obtained follow-up data. The individual was included in the age bracket that includes their age during the initial data collection.

Table 2.
Summary of Ages of Participants for Follow-up Data Collection

Age	Frequency	Percent
Birth – 11 months	3	20.0
12 months – 23 months	2	13.3
24 months – 35 months	2	13.3
36 months – 47 months	4	26.7
48 months – 59 months	4	26.7
60 months	0	0.00

Procedures

All of the participants were individuals already involved in Ready2Learn. Every mother within the program was informed of the research opportunity and asked for their participation. Due to many of the mothers being unable to read Somali or English, the home visitor read the consent form prior to their participation in the study. Considering that the program was collecting data on developmental outcomes prior to the initiation of this research study, the

consent to participate within this current research did not modify any aspect of the services already received. The consent to participate solely provided the researchers access to the data that was already being collected.

The goal of Ready2Learn is that a volunteer visits each family in the program for about an hour each week. The content of the visits usually include providing referrals to community services, reading to the children, and instructing the family on developmentally appropriate activities that they can implement in the home with their children. When the child's age is evenly divisible by 6 months (e.g., 6 months, 12 months, 18 months), the Ages and Stages Questionnaire (ASQ) is completed by the mother and home visitor together. The measure is scored and it is determined whether or not the child is developmentally on track. Based on the results of the ASQ, the home visitor will then provide specific activities, which have been standardized within the ASQ manual, geared toward the child's age and the developmental area that needs improvement. If the child is well-below the developmental cutoff score for their age-range, the child is referred to outside services.

Measures

The Ages and Stages Questionnaire (ASQ) is a measure designed to screen for developmental delays in children ages 4 months old to 5 years old. Each questionnaire is comprised of 30 questions that are grouped based on the assessed developmental area (e.g., communication, gross motor, fine motor, problem solving, and personal social). The parent responds to a variety of questions with one of the following answers: yes, sometimes, or not yet. The home visitor scores each answer with a response of yes equivalent to 10 points, an answer of sometimes receives 5 points and an answer of not yet receives 0 points. Scores on all questions within each developmental area are combined to determine whether the overall score for each

subcategory is above the cutoff score based on the normative sample that would signify a developmental issue. The ASQ is a convenient measure that takes around ten minutes to administer and 5 minutes to score (Bricker et al., 1999).

Reliability measures were determined for temporal stability and internal consistency. Cronbach's alphas were determined for each developmental domain for each different age questionnaire. For the communication domain, the range of alphas was from .63 to .75. When examining the gross motor domain, the range of alphas was from .53 to .87. For the fine motor domain alphas varied from .49 to .79. When looking at the problem solving domain, alphas fluctuate from .52 to .75. Finally, for the personal-social domain, alphas varied from .52 to .68 (Squires, Bricker, & Potter, 1996). Although these measures of internal consistency are lower than desired, this could be attributed to the fact that the subscales of the ASQ are not measuring one cohesive construct but rather many developmental milestones that were combined into subcategories. Therefore, it is not surprising that the internal reliability of subscales is slightly lower than what would be ideal for measures of more unified concepts.

Test-retest reliability was determined over a two week interval. Estimates of temporal stability demonstrated 94% agreement between the two administrations of the test and a standard error of measurement of .10. Inter-observer reliability was calculated at 94% agreement between ratings by parents and by examiners after a standardized assessment of the child's developmental abilities, with a standard error of measurement of .12. These results suggest adequate test-retest and inter-observer reliability (Squires, Bricker, & Potter, 1996).

Results

Initial data collection demonstrated that 17 children were close to the cutoff scores on one of the developmental outcomes and 11 children were below the cutoff scores on one of the

developmental outcomes. Refer to Table 3 to examine the specific frequencies of those close to or below the cutoff scores related to each subscale by age.

Table 3.

Summary of Number of Participants Close to or Below the Cutoff Score for Different Ages and Stages Questionnaire Subscales

Close to the Cutoff Score	Frequency (N=38)	Below the Cutoff Score	Frequency (N=38)
Fine Motor	4	Fine Motor	6
Personal-Social	5	Problem Solving	2
Gross Motor	1	Gross Motor	1
Problem Solving	2		
Communication	5		

Prior to conducting statistical analyses of the initial and follow-up data, it was necessary to determine whether the data meets all of the assumptions for the repeated measures ANOVA. The first assumption is that the data must be continuous. All of the data is ratio level data; therefore, this assumption has been met. The second assumption is that the independent variable should consist of two categorical related groups. This assumption has been achieved considering that every participant included in the repeated measures ANOVA has a score for the initial data collection, along with the follow-up data collection. The third assumption is that there should be no significant outliers in the differences between the two related groups. Upon examination of the difference scores, this assumption was not met considering that there were scores that were beyond two standard deviations from the mean. The fourth assumption states that the

distribution of the differences between the two related groups should be normally distributed. This assumption was not met for the Gross Motor subscale considering that the skewness was 1.85 and kurtosis was 3.54. Also there was high skewness in the Personal-Social subscale. The data was normal for all of the other subscales. Refer to Table 4 for the skewness and kurtosis values for each subscale. Finally, the fifth assumption states that there should be sphericity in the data. Mauchly's Test of Sphericity was not needed to test the fifth assumption considering that there cannot be a violation of sphericity when there are only two categorical related groups.

Table 4.

Skewness and Kurtosis Values for the Subscales on the Ages and Stages Questionnaire

Subscale	Skewness	Kurtosis
Fine Motor	.61	.85
Personal-Social	1.42	1.27
Gross Motor	1.86	3.54
Problem Solving	.78	.42
Communication	.27	-.35

Despite all five assumptions not being met, the researchers conducted a repeated measures ANOVA to test the hypothesis that Ready2Learn would increase the children's developmental scores on the Ages and Stages Questionnaire after six months of implementing developmentally appropriate activities of the home visiting program. Considering the small sample size, an assumption would be violated if a non-parametric test were used. Furthermore, a

transformation of the data would only distort the data from its true form and would most likely not correct the non-normality of the data.

A Repeated Measures ANOVA revealed a significant difference across time between developmental scores on the Gross Motor (F (1, 14) = 5.97, $p < .05$), Fine Motor (F (1, 14) = 6.25, $p < .05$), Problem Solving (F (1, 14) = 11.82, $p < .01$), and Personal-Social (F (1, 14) = 5.56, $p < .05$) subscales. However, there was not a significant difference between developmental scores on the Communication subscale across time (F (1, 14) = 1.98, $p > .05$).

A repeated measures ANOVA revealed that there was not a significant interaction between the changes in scores on the Ages and Stages Questionnaire and Age, F (16, 20) = 1.38, $p > .05$. Furthermore, statistical analysis demonstrated there was not a significant interaction between the changes in scores on the Ages and Stages Questionnaire and gender, F (1, 5) = 7.96, $p > .05$.

Table 5.
Descriptive Statistics and Results from the Repeated Measures ANOVA

Subscale		*M*	*SD*	*F*(14)	*p*
Communication	Initial	49.00	9.30	1.98	.18
	Follow-up	54.00	9.67		
Gross Motor	Initial	56.33	5.81	5.97	.03
	Follow-up	60.00	0.00		
Fine Motor	Initial	44.00	17.75	6.25	.03
	Follow-up	56.00	7.84		
Problem Solving	Initial	48.67	10.60	11.82	.004
	Follow-up	57.00	5.61		
Personal-Social	Initial	52.00	9.96	5.56	.03
	Follow-up	58.00	5.28		

Discussion

Consistent with the hypothesis, 17 children were close to the cutoff scores on one of the developmental outcomes and 11 children were below the cutoff scores on one of the developmental outcomes, indicating that many of the children enrolled stood to benefit from the program. Analysis of the data of the 15 children from whom we had initial and follow-up data demonstrated that all the children who were in a clinically concerning area in one of the five domains during initial data collection were no longer in this range at follow-up. This demonstrates that Ready2Learn was appears to be effective in improving the developmental outcomes for children by providing education to the parents on what activities can strengthen those concerning areas for their child. Furthermore, the presence of the home visitor each week also could have contributed to the increase in developmental outcomes. It is also possible that some of the improvements may be due to sources of stimulation and support outside of the program, which were not controlled for.

There was one child who was not in a concerning area of development during initial data collection but at follow-up had a deficit in communication. This can be explained by examining the child's specific age during both of the data collections and what specific skills the child had difficulties with. During initial data collection, the child was evaluated using the 12-month Ages and Stages Questionnaire which focuses more on the child making sounds for the Communication domain. During the follow-up, the 18-month Ages and Stages Questionnaire, which focuses on producing specific words in English, was utilized. It is possible that the parents of this child had not spoken much English to the child at this age, which may result in the inability of the child to speak English words at that time. This could signify that Ready2Learn should emphasis the importance of speaking both languages in the home, even when the child is

at a young age, as it can facilitate development of English communication skills, enhancing likelihood of readiness for kindergarten.

Upon further analysis of the specific domains in which children had deficits, the most common area of concern was fine motor skills as 36 percent of the deficits were in that domain. These results can be explained by the research of Bobbio, Morcillo, Filho, and Goncalves (2007). They found that children from low socioeconomic status had a 5.5-fold greater risk of developing deficits in fine motor skills when compared to those of a higher socioeconomic status. It is not the socioeconomic status alone that accounts for the deficits but rather the impact that a lower socioeconomic status places on the family and the quality of stimulation that the children may receive. Considering that the present study's population contains participants from a low socioeconomic status, who are also immigrant and refugee populations, these results can be expected. Moreover, de Barros, Fragoso, de Oliveira, Filho, and de Castro (2003) found that the development of fine motor abilities in preschool-aged children was affected by a variety of environmental variables, such as improper toy use based on age, lack of educational guidance and parent socialization, and low socioeconomic status.

This research demonstrates that many children in the Ready2Learn program could benefit from the activities focusing on fine motor skills; therefore, Ready2Learn could increase an emphasis on this domain. Research by Dinehart and Manfra (2013) supports an increase focus on fine motor skills considering that the fine motor skills of economically disadvantaged preschool-aged students significantly impacted math and reading achievement in second grade. Research by Grissmer, Grimm, Aiyer, Murrah, and Steele (2010) supports this relationship between early childhood fine motor skills and later achievement in school.

It is possible that the lack of statistical significant for the communication domain could be attributed to the parent's level of English speaking. If the parents are unable to adequately speak English, they would be unable to improve or maintain the developmental outcomes in their child for that domain. The home visitor may provide them with activities to stimulate development; however, the parents may not be able to implement them outside of the help of the home visitor each week.

Only one of the 20 parents with a child who had a developmental deficit, or were close to clinically concerning scores, reported that they were unsure as to whether their child had any concerning areas of development. All other parents stated that their children had no problems and were developing fine. This could indicate that the parents are unaware as to what is developmentally appropriate for each age-range and would not know what signs of developmental delays to look for. This percentage of parents who may lack knowledge on appropriate development supports the need for Ready2Learn as a home visiting program that targets recent immigrant and refugee families. This data also suggests that Ready2Learn should educate the parents on signs to look for in their children to determine whether behavior is developmentally appropriate. However, there may be other explanations for these results. It is possible that there is response bias when the parents answer the questions. Considering that most of the parents reported their answers to one of the home visitors because they could not read in English, it is possible that the survey may have elicited different answers than if the parents could write their answer rather than reporting it verbally to another individual. Furthermore, it is possible that some of significance behind the questions were lost in translation for parents who responded in a language other than English.

Limitations

This research study has several limitations. One possible limitation is that the data that was collected for the initial data collection may not have captured all of the participant's developmental scores prior to them receiving any home visiting. Some of the children were receiving home visiting services through Ready2Learn prior to the researchers implementing the use of the Ages and Stage Questionnaire. This could explain why some of the children presented with much higher scores on the initial data collection than other children.

Another limitation is the small number of participants in this study from which we had both initial data and follow-up data. Due to the small number of participants, the data from our population was not normally distributed. Although this would be what is expected when conducting clinical research as individual who need services are those that are significantly different from the norm. This non-normality to the data violates the third and fourth assumptions of the repeated measures ANOVA. Despite these violations, the researchers chose to still utilize a repeated measures ANOVA considering that the small number of participants would violate the assumptions of non-parametric test also. Therefore, the results should be interpreted with caution as a Type 1 error is possible.

Additionally, a limitation is that the sample of participants did not have diversity regarding the immigrant and refugee populations. It would be beneficial to recruit immigrants and refugees from other ethnicities, as they would also benefit from the program and researchers could then examine the differences in developmental deficits in relation to country or region of origin.

Research and Clinical Implications

The initial results from this study demonstrate that the Ready2Learn program can improve developmental outcomes in children from birth to age 5 that are in recent immigrant or

refugee families. Considering that this is only a pilot study on the effectiveness of the program, future researchers should replicate this study with more participants to obtain data that is a more accurate representation of the results. Furthermore, future researchers should examine the effectiveness of the program with other immigrant populations, such as Latino Caucasians. Additionally, researchers should examine demographic variables of each participant, such as the parent's education level, to determine for which children developmental deficits are more common, along with an analysis of which demographic variables facilitate or deter improvements from the Ready2Learn program.

This suggests that the Ready2Learn program is effective in improving the developmental outcomes for children in recent immigrant or refugee families. The program should continue to implement the Ages and Stages Questionnaire to the children every six months and implement developmental activities based on the deficits observed. Throughout the weekly visits, Ready2Learn could put more emphasis on developing fine motor skills as that is a common deficit in children in this research study.

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