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FLORIDA INTERNATIONAL UNIVERSITY

Miami, Florida

THE EFFECTS OF PEER TEACHING OF INFANT MASSAGE ON GENERAL SELF-EFFICACY AND MOTHER INFANT ATTACHMENT AMONG MOTHERS IN A RESIDENTIAL REHABILITATION FACILITY FOR DRUG ADDICTION AND SUBSTANCE ABUSE

A dissertation submitted in partial fulfillment of the

requirements for the degree of

DOCTOR OF EDUCATION

in

ADULT EDUCATION AND HUMAN RESOURCE DEVELOPMENT

Vivian Bango-Sanchez

2010

To: Interim Dean Marie McDemmond
College of Education

This dissertation, written by Vivian Bango-Sanchez, and entitled The Effects of Peer Teaching on General Self-Efficacy and Mother Infant Attachment among Mothers in a Residential Rehabilitation Facility for Drug Addiction and Substance Abuse, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

_____
Thomas G. Reio Jr.

_____
Delia C. Garcia

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Luz S. Porter

_____
Tonette S. Rocco, Major Professor

Date of Defense: March 25, 2010

The dissertation of Vivian Bango-Sanchez is approved.

_____
Interim Dean Marie McDemmond
College of Education

_____
Interim Dean Kevin O'Shea
University Graduate School

Florida International University, 2010

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DEDICATION

This dissertation is dedicated to the memory of my mother, Isaris, who was my role model. Her passion for caring for others was extraordinary and evident to all those who knew her or knew of her. She touched every heart from the first hello. May her spirit of caring live on through those who read this dissertation.

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And most of all to God, through Whom all things are made possible. For His continual Blessings, Guidance, Love, Patience and Wisdom that carries us through our daily journey on earth.

ABSTRACT OF THE DISSERTATION

THE EFFECTS OF PEER TEACHING OF INFANT MASSAGE ON GENERAL SELF-EFFICACY AND MOTHER INFANT ATTACHMENT AMONG MOTHERS IN A RESIDENTIAL REHABILITATION FACILITY FOR DRUG ADDICTION AND SUBSTANCE ABUSE.

By

Vivian Bango-Sanchez

Florida International University, 2010

Miami, Florida

Professor Tonette S. Rocco, Major Professor

Approximately 200 million people, 5% aged 15-64 worldwide are illicit drug or substance abusers (World Drug Report, 2006). Between 2002 and 2005, an average of 8.2% of 12 year olds and older in the Miami, Fort Lauderdale metropolitan areas used illicit drugs (SAMHSA, 2007). Eight percent of pregnant women, aged 15 to 25, were more likely to have used illicit drugs during pregnancy than pregnant women aged 26 to 44. Alcohol use was 9.8% and cigarette use was 18% for pregnant women aged 15 to 44 (SAMHSA, 2005).

Approximately a quarter of annual birth defects are attributed to the exposure of drugs or substance abuse in utero (General Accounting Office, 1991). Physical, psychological and emotional challenges may be present for the illicit drug/substance abuse (ID/SA) mother and infant placing them at a disadvantage early in their relationship (Shonkoff & Marshall, 1990). Mothers with low self efficacy have insecurely

attached infants (Donovan, Leavitt, & Walsh, 1987). As the ID/SA mother struggles with wanting to be a good parent, education is needed to help her care for her infant.

In this experimental study residential rehabilitating ID/SA mothers peer taught infant massage. Massage builds bonding/attachment between mother and infant (Reese & Storm, 2008) and peer teaching is effective because participants have faced similar challenges and speak the same language (Boud, Cohen, & Sampson 2001). Quantitative data were collected using the General Self-Efficacy and Maternal Attachment Inventory-Revised Scale before and after the 4-week intervention program. A reported result of this study was that empowering ID/SA mothers increased their self-efficacy, which in turn allowed the mothers to tackle challenges encountered and created feelings of being a fit mother to their infants.

This research contributes to the existing database promoting evidence-based practice in drug rehabilitation centers. Healthcare personnel, such as nurse educators and maternal-child health practitioners, can develop programs in drug rehabilitation centers that cultivate an environment where the ID/SA rehabilitating mothers can peer teach each other, while creating a support system. Using infant massage as a therapeutic tool can develop a healthy infant and nurture a more positive relationship between mother and infant.

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CHAPTER I

INTRODUCTION

This experimental study investigated whether peer teaching of infant massage techniques among mothers in a residential drug rehabilitation program increased self-efficacy and maternal infant bonding. This chapter includes the background of the study, the statement of the problem, purpose of the study, hypothesis, and conceptual framework**.** The chapter concludes with the definition of terms, significance of the study, and summary.

Background of the Study

Illicit drug use/substance abuse (ID/SA), and residential rehabilitation programs for ID/SA mothers will be discussed.

Illicit Drug Use/Substance Abuse

Illicit drug use/substance abuse (ID/SA) mothers are known to have a history of low self esteem and high levels of depression (Smith, Dent, Coles, & Falek, 1992). ID/SA mothers also have a history of dysfunctional families, poor coping skills, inadequate social support networks, and negative affective states (Davis, 1997). A need for secrecy alienates these women from mainstream culture and creates isolation from a potentially supportive environment (Boyd, 2004). ID/SA interferes with ego development resulting in greater immaturity, self-centeredness, low self-discipline, and problems with impulsivity (Fineman, Beckwith, Howard, & Espinosa, 1997). Mothers with low self esteem provide less quantity and quality of stimulation for their infants and are slower in responding to their infant's needs (Patel, Rahman, Jacobs, Hughes, 2004). Also, depressed mothers are more likely to have negative views of themselves as parents,

seeing themselves as having less personal control over their children's development, and less able to influence their children positively (Patel et al., 2004).

Illicit drugs include marijuana/hashish, cocaine/crack, heroin, hallucinogens and inhalants or any prescription medications used non-medically (Hughes, Sathe, & Spagnola, 2008). Substance abuse, while it includes illicit drugs, also includes tobacco and alcohol and is a maladaptive pattern of substance use, leading to the failure of fulfilling daily functions (American Psychological Association, 2000). Society's discrimination and low tolerance towards ID/SA women creates a sense of shame among the mothers (Boyd, 2004). Having a community like environment may prevent the need for secrecy.

Residential rehabilitation programs designed especially for substance abusing mothers are perceived more positively when the program involves children and family (Kunkel, 2002; Tanner, 1996). In order to promote self-empowerment and responsibility, rehabilitation programs need to nurture choice and autonomy (Robitschek & Kashubeck, 1999). Rehabilitation programs allowing mothers to have their children with them have proven to be effective (Fineman, Beckwith, Howard, & Espinosa, 1997). In a rehabilitation program peer teaching can easily take place among the residents, since the ID/SA mothers are in contact with each other all the time.

Peer teaching is effective because participants have faced the same challenges in the same context, they speak the same language, reinforcement occurs through ongoing contact, and it is cost-effective (Boud, Cohen & Sampson, 2001; Kelly et al., 1991; Peers, Ledwith & Johnston, 1993). Peer teaching identifies with the social influences of various theoretical models, such as, Bandura's Social Cognitive Learning (Bandura, 1977b),

McGuire's Social Psychology (McGuire, 1964) and Baric's Social Norms (Baric, 1977). These theories observe that friends seek advice from friends and are influenced by the expectations, attitudes and behaviors of the groups to which they belong (Mellanby, Rees & Tripp, 2000). The element of power, domination or authority tends not to exist in peer teaching situations; therefore, it invites a more conducive learning environment (Boud et al., 2001). Peer teaching builds "espirit de corps" (morale) in peer tutors (Guy, 2002). Peer teaching is considered to be empowering for those involved in the process (Bandura, 1977a). This study was undertaken because the literature indicates that a residential rehabilitation center for ID/SA mothers would be an effective environment for peer teaching since they are facing the same challenges and are in constant communication with each other.

Residential Rehabilitation Program

It was not until 1994 that National Institutes of Health (NIH) published guidelines to include women and members of racial and ethnic minorities as subjects in clinical research. Since then, research examining substance abuse treatment for women have been conducted (NIDA, 1999). Residential rehabilitation programs for women focus on treating women's specific needs. These needs include prenatal care, pregnancy, parenting classes, pediatric/well-baby care, childcare, transportation. Addressing also multiple roles of women (mother, partner, friend), while creating a nurturing and supportive group therapy environment (Ashley, Marsden, & Brady, 2003). Los Angeles County programs have also offered psychosocial services, such as job training, life-skills training, client advocacy, peer support group, and assistance with housing (Greenfield et al., 2007).

The residential rehabilitation programs provide long-term treatment, usually 6-18 months (Rosack, 2001; Stevens & Arbiter, 1995). Women who have their infant/children during treatment tend to remain in treatment longer and have improved outcomes (Ashley, Marsden & Brady, 2003; Hughes et al., 1995; Szuster, Rich, Chung & Bisconer 1996; Wobie, Eyler, Conlon, Clarke & Behnke, 1997). Providing parenting skills improves the ID/SA mothers' parenting attitude and knowledge, self-esteem that affects maternal-child interaction and yield healthier infants/children (Camp & Finkelstein, 1997; Christensen, Brayden, Dietrich, McLaughlin, Sherrod & Altimer, 1994). Providing the ID/SA mothers with infant massage techniques is not only physically beneficial to the infant, but also improves the mothers' knowledge of infant's cues, creates a sense of calmness and confidence in parenting, etc. (McClure, 2000).

Statement of the Problem

Associated with frequent use of ID/SA, especially marijuana, there is an increase in violent behavior, depression and negative coping skills (White, Loeber, Stouthamer-Loeber, Farrington, 1999). In the United States, 675,000 children are seriously mistreated by substance abusing caretakers and 10 million children are being raised by addicted parents (Belew & Morrison-Rodriguez, 2005). In 2003, the United States Department of Health and Human Services (USDHHS) reported that at least 70% of child abuse fatalities involved substance abuse. Although there are statistics on ID/SA and abuse, there is a gap in the research regarding self-efficacy and maternal infant attachment. Also, not enough research has been done on linking self-efficacy and maternal infant attachment on one hand to peer teaching of infant massage on the other hand, creating a limitation in the field.

Having a strong sense of efficacy enhances human accomplishment and personal well-being, reduces stress, and lowers vulnerability to depression (Bandura, 1994). Self-efficacy is the expectation a caregiver holds about his or her ability to perform successfully (Jones & Prinz, 2005). Higher levels of self-efficacy may reflect greater success in parenting competencies and parental psychological functioning (Coleman & Karraker, 1998). Parents reflecting high self-efficacy are more likely to exercise parenting strategies, which increase children's successes in both academic and social-psychological domains (Ardelt & Eccles, 2001).

Increasing the social-psychological domain in later life is also a product of maternal-infant bonding. Sixty-five percent of infants within the first year of life are securely bonded to their mothers, contributing to toddlers, preschoolers and kindergartners being more persistent and enthusiastic in pursuing a task. These children are more sociable, cooperative, competent and more ego-resilient (Colin, Low & Associates, 1991).

Purpose of the Study

The purpose of this experimental study was to investigate if there was an increase in self-efficacy and maternal infant bonding/attachment during peer teaching of infant massage among ID/SA mothers in a residential rehabilitation program.

Hypotheses

The hypotheses were:

H_1: ID/SA mothers who have participated in peer teaching of infant massage will report higher levels of self-efficacy, than those mothers who have not participated.

H_2: ID/SA mothers who have participated in peer teaching of infant massage will report higher levels of bonding/attachment, than those mothers who have not participated.

Conceptual Framework

Self-efficacy is a more consistent predictor of behavioral outcomes than have other motivational constructs (Graham & Weiner, 1996). Self-efficacy beliefs are based on the interpretation of one's previous performance or past experiences and observations and modeling of others. (Bandura, 1977a).

Self-efficacy influences the thought patterns and emotional reactions of a person. High levels of self-efficacy create feelings of serenity in approaching difficult activities (Pajares, 2005). Self-efficacy beliefs are created by four sources that include credibility, empowerment, role modeling and reinforcement (Pajares, 2005).

Bandura observed that for role modeling, also known as observational learning to occur, the following four steps need to take place. The first step is paying attention, if there are distracters learning is going to be decreased. The second is retention, using a language that is familiar to the learner is important to enhance learning because it is easier to remember the lesson. The third is reproduction, being in close proximity allows the learner to participate in a return demonstration immediately after the illustrated technique, increasing the learning. And fourth is motivation, if the learner understands the benefits of doing the technique, there is an increase in his or her willingness to learn (Boeree, 2006). Therefore, individuals need an opportunity to practice modeled behavior and continuous positive reinforcement to achieve success. In sufficient time, individuals apply the socially learned behavior and believe themselves empowered (Bandura, 1977b).

Having a strong sense of efficacy enhances human accomplishment and personal well-being (Bandura, 1994). Having high assurance in individuals' capabilities also changes their view of difficult tasks as threats to avoid and views them as challenges to be mastered. Individuals with strong self-efficacy maintain a strong commitment to challenging goals and they persevere in the face of failure. Their sense of efficacy recovers quickly after failures or setbacks and there is a sense of assurance that they can exercise control over any threatening situation. Promoting an efficacious outlook produces personal accomplishments, reduces stress and lowers vulnerability to depression (Bandura, 1994).

Definition of Terms

Illicit drug use is an over indulgence in and dependence on a stimulant, depressant, chemical substance, herb (plant) or fungus leading to effects that are detrimental to an individual's physical or mental health, or the welfare of others. (Mosby, 2005).

Infant massage is made up of Swedish strokes, reflexology, and Indian massage strokes, performed on a child under the age of one (McClure, 2000). There will be between two to seven strokes learned, depending on the body section being taught that session.

Maternal infant bonding (attachment) is the establishment of a close emotional relationship between a mother and her newly born infant (Bloomsbury Publishing Plc., 2007). Participant bonding to infant will be assessed by having them fill out a four point Likert scale with statements about their thoughts, feelings, and experienced situations towards their infant.

Peer teaching involves students learning from and with each other in ways that are mutually beneficial and involve sharing knowledge, ideas, and experience between participants (Longaretti, Godinho, Parr, & Wilson, 2004). ID/SA mother teaching another ID/SA mother in the same residential drug rehabilitation center.

Rehabilitation program is a substance abuse treatment and halfway house consisting of residential long-term treatment, outpatient programs and partial hospitalization/day treatment for persons with co-occurring mental and substance abuse disorders. Programs for pregnant/postpartum women have residential beds for clients' children (US Drug Rehab Centers, 2006).

Self-efficacy is the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations (Bandura, 1995). Participant's self-efficacy will be assessed using the General Self-Efficacy scale by Schwarzer and Jerusalem (1995).

Substance abuse is a pattern of harmful use of any substance for mood-altering purposes, such as alcohol, inhalants, solvents, anabolic steroids, etc. (Buddy, 2007). Although alcohol is legal it is considered an abused substance if used on six or more days in the past year, criteria established by the American Psychiatric Association (APA) in its Diagnostic and Statistical Manual of Mental Disorders (DSM)] in 2000. Participant substance abuse will be self-described on the demographic questionnaire indicating the type and frequency of use.

Significance of the Study

This study contributed to understanding the effect of peer teaching of infant massage on the self-efficacy and maternal infant bonding/attachment of residential

rehabilitating illicit drug use/substance abuse (ID/SA) mothers. The participants of this study noticed a shift in their confidence when performing a task and resilience to obstacles they encounter. The mothers noticed a shift in their bonding/attachment to their infant. Residential rehabilitation programs found peer teaching programs useful in increasing a resident's sense of personal competence, increasing morale and decreasing depression, along with increasing their maternal infant bonding/attachment. This research yields information useful for other drug residential rehabilitation centers' adult education programs.

Summary

This study investigated how the self-efficacy and the maternal infant bonding/attachment of a recovering illicit drug use/substance abuse (ID/SA) mother was affected when peer teaching infant massage techniques. Using Bandura's Self-Efficacy conceptual framework, the study showed a less depressed, more competent recovering illicit drug use/substance abuse (ID/SA) mother. This chapter introduced the background of the study, the statement of the problem, purpose of the study, hypothesis, and conceptual framework**.** The chapter concludes with the definition of terms, significance of the study, and summary.

The next chapter will review the literature that supports the study. Chapter 3 will introduce and describe the research method and the design of the study. Chapter 4 will present the data and findings of the study and chapter 5 will finalize the study with a summary, conclusion and recommendations.

CHAPTER II

LITERATURE REVIEW

This chapter presents the literature review on illicit drug/substance abuse (ID/SA) history, statistics, implications for ID/SA mothers and child development, and the effects on mother and child attachment This chapter will also present the significant literature on peer teaching, self-efficacy, residential rehabilitation programs, and infant massage that frame variables in this study. The chapter will conclude with a summary.

Illicit Drug/Substance Abuse

To be able understand the illicit drug/substance abuse issue, it is necessary to discuss its history, and the severity of use can be measured by looking at statistics. Finally, it is important to look at ID/SA implications on the mothers, their child's development, and effects on the mother child attachment.

History

Marijuana/hashish, cocaine/crack, heroin, hallucinogens, inhalants, and/or any prescription medication used non-medically are considered illicit drugs (SAMHSA, 2007). Although alcohol and tobacco are legal, they can be considered abused substances, if used beyond the criteria set by the American Psychiatric Association. Criteria established by the American Psychiatric Association (APA) in the fourth edition *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) states that if alcohol is used on six or more days in the past year, it is an abuse (APA, 2000). To be more specific, it is more than three to four drinks for women on any occasion **(**University of North Carolina, 2006 **)**. The National Survey on Drug Use and Health NSDUH

(SAMHSA, 2005) includes a series of questions about the use of tobacco products. Cigarette use is considered by the survey, as smoking a part or the whole cigarette. When tobacco leads to the failure of fulfilling daily functions, it is considered a maladaptive pattern of substance use (APA, 2000).

Illicit drug use/substance abuse is not new. The description of a brewery made on Egyptian papyrus dated 3500 BC is the earliest historical recording of alcohol production (Szasz, 2003). The use of opium was recorded at least 3,400 years BC (Hill, 2004). Wine is noted throughout the Bible in the Old Testament. For example, in 350 BC Proverbs 31: 6-7 and later in 250 BC Psalms104: 14-15 (Szasz, 2003). During bootlegging in 1929, 40 Americans per every million died each year from methyl alcohol poisoning (Szasz, 2003).

Columbus introduced tobacco to Europe in 1493, and the husband of Pocahontas sent the first shipment of tobacco from Jamestown, Virginia to England in 1613. When Napoleon's army returned from Egypt in 1800, hashish and marijuana were introduced to France. In 1841, hashish was used by Dr. J. J. Moreau to treat mental patients at Bicêtre (Szasz, 2003).

Morphine was isolated and described in 1805 by a German chemist Friedrich Sertürner (Szasz, 2003). During the American Civil War, morphine became the drug of choice for pain relief, resulting in over 400,000 soldiers suffering from morphine addiction (Narconon, 2008). Years later, in 1844 the pure form of cocaine was isolated. In 1884, Sigmund Freud used cocaine to treat his depression. Synthesizing of heroin began in 1898 by the Germans, and it was not until 1903 that Coca-Cola changed its composition from cocaine to caffeine (Szasz, 2003).

When American missionaries in China saw how British opium was ruining Chinese people, the Americans thought that they could find other things to trade. Several international conventions were called by President Theodore Roosevelt. It was the second convention of 1912, where solving the opium problems of the Far East, especially, China, took place. It was not until the Harrison Narcotics Act of 1914 that drugs became illegal (Brecher, 1972).

Illicit Drug Substance Abuse Statistics

Today approximately 200 million people globally are considered illicit drug or substance abusers. Approximately 5% of these people are between the ages of 15-64, and half of this age group use drugs regularly, such as once a week (United Nations Office on Drugs and Crime, 2000;UNODC, 2006).

The general consensus from the United Nations (2004) case studies is that men use more ID/SA than women; that does not apply across the different age groups. In Australia the age group between 14 to 19 year olds, reported that 37.9 percent of females and 37.4 percent of men have used an ID/SA (Australian Institute of Health and Welfare, 2003; Hall, Teesson, Lynskey & Degenhardt, 1999). Another global observation is that each country had its unique type of ID/SA being dominant. In Afghanistan a daily use of a combination of opium and pharmaceuticals is common. The Brazilian population uses cannabis, cocaine and benzodiazepines (Zilberman, Hochgraf, Brasiliano & Milharcic, 2001). Cocaine and cocaine base paste dependency are higher among women in Chile and alcohol use increased in adolescent women (Lara, 2003).

Taking a look at Europe, in Germany it is estimated that approximately 15 to 20 percent of the illicit drug abusers are women using poly-substance with a preference for

heroin (Vogt, 2004; Vogt, 2003). In European Union countries gender difference is almost non existent among 15 and 16 year olds using cannabis. The difference is girls are initiating the use of experimental substances before boys (European Monitoring Centre for Drugs and Drug Addiction, 2000). In the Russian Federation during 1993 to 1999, the annual number of first time female drug addicts increased 10 times and 16 times in Moscow (Mokhnatchev, 2002).

Similar ID/SA issues exist in other countries such as, India, Iran, and Kenya (Beckerleg, 2004; Beckerleg & Hundt, 2004; Murthy, 2002; Razzaghi, Rahimi, Hosseni & Madani, 1999). In China, the rate of injecting ID/SA ranges from 50 % to as high as 90 %, depending on the provinces (Hao, Xiao, Liu, Young, Chen, Zhang, Li, Shi, Chen & Yang, 2002).

An estimated 20.4 million people in the United States over the age of 12 have reported using an illicit drug at least once in their lifetime (SAMHSA, 2007). In Florida, over eight percent of people 12 years and older used illicit drugs in the month prior to the National Survey on Drug Use & Health, between 2004 & 2005 (SAMHSA, 2007). During the combined years of 2002 to 2005, an average of 8.2% of 12 year olds and older used illicit drugs in the month prior to the survey in the Miami, Miami Beach and Fort Lauderdale metropolitan areas (SAMHSA, 2005). The 2005 and 2006 rate of current illicit drug use among people12 years and older were very similar, depicting no dramatic increase (SAMHSA, 2007).

The National Survey on Drug Use and Health is an annual questionnaire conducted face to face. This is sponsored by the Federal Government's leading agency, Substance Abuse and Mental Health Services Administration (SAMHSA). It collected

data in 2005 and 2006, on over 67,802 persons 12 years old and older, including over 2,000 pregnant women aged 15 to 44. The results revealed that 8 percent of pregnant women aged 15 to 25 were more likely to have used illicit drugs during pregnancy, and women aged 26 to 44 were at 1.6 percent. Alcohol use reported among pregnant women dropped from 10.6% in 2004 to 4.6% in 2006. Cigarette use was 23 percent for women aged 15 to 44 and no significant difference on women between the ages of 15 to 25 (SAMHSA, 2007).

Implications for ID/SA Mothers and Child Development

In general, having an infant is considered a crisis event due to all the biological, psychological, and family changes that take place (Brazelton & Cramer, 1990). In addition to emotionally adjusting through those changes; the ID/SA mother has to handle the fears she is experiencing wondering what effects her substance abuse is having on her fetus and/or newborn infant (Boyd, 2004).

Over one million babies each year are born into a substance abusing home (Chasnoff, 2007). Yearly 120,000 (1 in 33) babies born in the United States have birth defects (CDC, 2007), and a quarter or more of these birth defects are attributed to the exposure of drugs or substance abuse in utero (General Accounting Office, 1991).

Fetal anomalies from the use of cocaine during pregnancy include abnormal perinatal complications for the infants, premature births, upper extremity deformities, organ necrosis, neonatal growth, paramental delays, low birth weight, developmental delays, and neurobehavioral disorders. Later on these children exhibit language deficits, emotional problems, motor skill challenges, and school underachievement (Bandstra, et al., 2002; Lopez, Taeusch, Findlay, & Walther, 1995; Singer, et al., 1997). Infants born

to heroin abusing mothers in Israel had lower birth weights and smaller head circumferences. Later these children displayed hyperactivity, inattention, and behavioural problems (Michailevskaya, Lukashov, Bar-HamBurger, & Harel, 1996).

In 1993, 75% of 223 children exposed to intrauterine drugs and alcohol exhibited motor delays (Budden, 1996). Alcohol consumption during pregnancy typically produces a smaller infant, making caring for that infant more difficult for the ID/SA mother (Royal College of Physicians, 1995). Tobacco use during pregnancy causes increased incidents of spontaneous abortions, stillbirths, sudden infant death syndrome (SIDS), and a later onset of childhood diabetes (Dempsey & Benowitz, 2001; Montgomery & Ekbom, 2002). Infants exposed in utero to tobacco, alcohol, methamphetamines, and marijuana have smaller head circumference, shorter birth length, and lower birth weight (Covington, Nordstrom, Ager, Sokol & Delancy-Black, 2002). Children exposed to alcohol and tobaccos intrauterine have shown decreased intelligence test scores (Richardson, Ryan, Willford, Day & Golschmidt, 2002). Marijuana exposed babies undergo withdrawal-like symptoms, exhibiting excessive crying and trembling (NIDA, 2005). The fetus exposed to marijuana and opiates may become an infant less likely to respond and habituate to repeated visual stimuli, have more tremors, and startle easily (Zuckerman, 1985).

Infants exposed to opiates in utero have motor immaturity, decreased alertness, and decreased auditory and visual orientation (Zuckerman, 1985). In addition, infants suffer withdrawal symptoms as neonates, sleeping problems and display continuous crying that may last up to the first year of life (Soepatmi, 1994).

In 1993, the Birth Defects Monitoring Program reported 126 cases of fetal alcohol syndrome (FAS) out of 188,905 newborns (Centers for Disease Control and Prevention CDC, 2007). The major symptom of FAS is the failure of the infant to thrive, and if left untreated, death can occur. An additional finding of the FAS infant is a decrease in total amount of sleep time and an increase in fragmentation of sleep periods (Zuckerman, 1985). A decreased ability for an infant to habituate creates a more irritable infant. Excessive crying is reported to be the reason 80% of battering occurs in infants less than 1 year old by the ID/SA parent (Zuckerman, 1985).

Besides a myriad of physical challenges facing the infant from intrauterine drug exposure, there is the psychological effect of not being able to achieve the quiet alert state. This is the state in which the infant is most responsive to his mother's face voice and touch (Kronstadt, 1991). During infant massage the levels of melatonin increases and stress levels are lowered (Mainous, 2002). Teaching the ID/SA rehabilitating mother massage is an effective intervention to help her drug exposed infant.

Effects on Mother and Child Attachment

Forming and maintaining relationships are at the core of humanity (Perry, 2001). In healthy child development, bonding is considered a cornerstone because it establishes the basis for a child's emotional and social development and later influences relationships with family, friends, and peers (U.S. Department of Health and Human Services, 1991). In addition to bonding, a parent's role includes providing basic care, emotional warmth, stimulation, guidance and boundaries, stability, and ensuring safety (Advisory Council on the Misuse of Drugs, ACMD, 2003). Bonding and all of these responsibilities are jeopardized when the mother suffers from feelings of abandonment, isolation, a loss of

child custody, powerlessness, and impatience and anger when siblings are involved (Coyer, 2003; Wallace, 1992).

Illicit drug and substance abusing mothers report a history of low self esteem, more parenting stress, and higher levels of depression than mothers not using drugs (Smith, Dent, Coles, & Falek, 1992; Suchman & Luthar, 2000). Dysfunctional families, poor coping skills, inadequate social support networks, and negative affective states are also found in the history of the ID/SA mother (Davis, 1997). Over the past 30 years, child maltreatment has been consistently linked to substance abusing families (National Research Council, 1993).

In the United States, 675,000 children are seriously mistreated by substance abusing caretakers and 10 million children are being raised by addicted parents (Belew & Morrison-Rodriguez, 2005). At least 70% of child abuse fatalities involve substance abuse (USDHHS, 2003). By the age of 2, children who have been exposed to cocaine inutero are at higher risk for maltreatment (Levental, Forsyth, Qi, Johnson, Schroeder & Votto, 1997).

Their ID/SA secret alienates women from mainstream culture and creates isolation from a potentially supportive environment (Boyd, 2004). Illicit drug and substance abusing women also have an interference with ego development that results in greater immaturity, self-centeredness, low self-discipline, and problems with impulsivity, thus, limiting parenting effectiveness (Fineman, Beckwith, Howard, & Espinosa, 1997; Porter & Porter, 2004).

Mothers with low self esteem provide less quantity and quality of stimulation for their infants resulting in less responsiveness to their infant's needs (Patel et al., 2004).

Depressed mothers are more likely to have negative views of themselves as parents. They see themselves as having less personal control over their children's development, being less able to influence their children positively, and tend to be more critical and more rejecting of their child (Lyons-Ruth, Wolfe, & Lyubchik, 2000).

The ID/SA mother experiences stress trying to be a good parent to her infant while juggling a chaotic life (Roberts, 1999) and being able to afford daily essentials because approximately half of these mothers have their children on welfare program (Dore, Doris, & Wright, 1995). Poverty and homelessness can create negative interactions between mother and child (Policy Research Associates, 1999).

Some ID/SA mother's thought processes can also affect the relationship between herself and her child. These may include inappropriate expectations of their child's behavior, engaging in role reversal (making the child fulfill the mother's needs), becoming self-absorbed and, therefore, not being empathetic towards their child or sensitive during interactions (Hans, 2002; Policy Research Associates, 1999). Suppressed guilt almost always will be misdirected toward the family or against self in the form of depression, low self-esteem, or destructive behavior (Policy Research Associates, 1999). Depression can lead to risk taking behaviors, such as illicit drug use/substance abuse (Patel et al., 2004), now creating a vicious cycle with ID/SA.

There is a relationship between intrauterine alcohol exposed infants and insecure maternal attachments (O'Connor, Kogan, & Findlay, 2002). In the U.S., alcohol abuse rates vary between 25-84% among the maltreating families (Blau, Whewell, Gullotta, & Bloom, 1994). Intrauterine cocaine exposed infants demonstrate less crying when separating from their mother compared to non-exposed infants (Beeghly, Frank, Rose-

Jacobs, Cabral & Tronick, 2003). At 18 months of age, children exposed to cocaine and opiates have lower rates of attachment compared to non-exposed children (Seifer et al., 2004). Associated with frequent use of ID/SA, especially marijuana, the ID/SA mothers have an increase in violent behavior, depression, and negative coping skills (White, Loeber, Stouthamer-Loeber, & Farrington, 1999).

If the maternal infant attachment is not developed, the child later on in life will have an increased risk for behavioral difficulties at home as well as in school; increasing the risk for physical abuse and creating low self-esteem. Sometimes it is difficult to detect immediate effects of intrauterine drug exposure, because depending on the drug the influence may not show up until elementary school (Kronstadt, 1991).

Significant motor skill deficit and cognitive delay noted in infants exposed to intrauterine drugs require attention that ID/SA mothers often cannot provide. Performing school activities such as writing, drawing or painting, can be very trying for both mother and child. Playing with toys or engaging in other activities may also be frustrating due to hyperactivity and attention deficit that becomes more noticeable as the child ages (Arendt, Angelopoulous, Salvator, & Singer, 1999; Miller –Loncar, Lester,Seifer, Lagasse, Bauer, Shankaran, Bada, Wright, Smeriglio, Bigsby and Liu, 2005). Much patience is needed when a 7 year old child with a history of intrauterine ID/SA scores a significantly lower IQ, tests deficient on visuospatial memory, and has slower visuomotor speed than a non-exposed child (Arendt, Short, Singer, Minnes, Hewitt, Flynn, Carlson, Min, Klein, Flannery, 2004; Schroder, Snyder, Sielski & Mayers, 2004).

All those physical, psychological and emotional challenges may be present, for the ID/SA mother and infant, placing them at a disadvantage at an early start in their

relationship. Through the development of a supportive environment, such as, a loving family, a good house, available resources in school and scheduled healthcare visits, those negative impacts can be decreased (Shonkoff & Marshall, 1990).

If the ID/SA mother becomes overwhelmed with all the infant's challenges, she'll doubt her capabilities as a competent mother and her self-efficacy is diminished. Low self-efficacy will lead to having low aspirations and unwillingness to commit to the goals they chose to pursue. They tend to give up easily when faced with challenges, falling easily into depression and feeling stressed. Then the ID/SA mother's patience has decreased and physical abuse becomes an option.

One way of decreasing maltreatment and child abuse is by increasing the ID/SA mother's self-efficacy. According to Bandura (1994), each success achieved, increases self-efficacy, along with vicarious experiences. Because peer modeling increases self efficacy (Schunk & Hanson, 1985), teaching the ID/SA mother infant massage so they in turn can teach someone who is in a similar situation, increased their self-efficacy. With high levels of self-efficacy, feelings of serenity are created, which is important when approaching difficult activities (Pajares, 2005).

Peer Teaching

The concept of peer teaching dates back to Aristotle (Wagner, 1982). In the early 1800s Joseph Lancaster of London, England, started the "monitorial system", where teachers taught "monitors" who then passed on the learned information to other children (Gerber & Kauffman, 1981, p155). Peer teaching is a social behavior that occurs between people and in different venues of teaching (Bandura, 1986). The social influence of

various theoretical models such as Bandura's (1977) social learning, McGuire's (1964) social psychology, and Baric's (1977) social norms all relate to peer teaching. These theories espouse similar beliefs that observe friends asking advice from friends and are also influenced by the expectations, attitudes, and behaviors of the groups to which they associate (Mellanby, Rees, & Tripp, 2000). Peer teaching is referred to by many names including peer tutoring, peer education, and partner learning (Kalkowski, 2001). Simply stated, people learn from observing peers' behavior/habits or valuing peers' knowledge (Bandura, 1977a).

There are various methods of peer teaching such as formal tutoring (whole classes in school) and group discussions (youth centers). Another method, informal tutoring, takes place in settings that are not structured, for example one to one (adult to adult, adult to child and child to adult), buddy system, and counseling (Turner & Shepard, 1999). The method selected is based on the intended outcome of the project, for example, to pass on information, change behavior, develop skills, or develop community. The flow of content at hand or the culture being targeted is also a consideration in peer teaching (Kalkowski, 2001; Turner & Shepherd, 1999). Peer teaching recently has been utilized in health projects, such as trying to reduce smoking among young people (Abernathy & Bertrand, 1992). The World Health Organization (WHO) commissioned a global review of peer teaching HIV prevention initiatives in 1991 as a means of preventing the spread of HIV among youth (Peers, Ledwith & Johnston, 1993).

Communities that are surrounded by strong cultural taboos tend to benefit more from having their own peers disseminating information. For example, how to reduce

risky behaviors, how to protect themselves, what resources are out there for their needs, treatment places and other health and social services (Needle et al., 2005).

A nationwide study looked at 20,000 out of treatment drug abusers in the United States, half of which had never been in a treatment program. Some were assigned to a peer taught group. There they learned the risks of drug use and STDs, correct use of condoms, and proper cleaning of injection equipment. The peer led group reduced the crack cocaine use by 83 percent. The men did better than the women, suggesting that in future studies, interventions should be tailored differently for women. (Cottler et al., 1998).

There is an international study that looks at five female and two male former injecting drug users employed in a drop in center in Kermanshah, Islamic Republic of Iran, that peer teaches men and women from the neighborhood. They educate them on basic knowledge of disease transmission and safe disposal of used needles and syringes. They participate in group therapy as both facilitators and as clients. They also provide care during a client's detoxification phase, and have developed a therapeutic network for former users. The former users, who have their own business, will also provide employment for other peers (Needle et al., 2005).

It has been posited that peer teaching is valued by both the teacher and the learner. In this study, second year medical students were peer teaching groups of five to ten first year medical students, the subjects were divided into different blocks. The first block was anatomy, the second block was physiology, pathology, medicine and pharmacology. Qualitative and quantitative pre and post data was collected. Each audio-recorded group lasted 60 minutes.

The first year medical student's comments were that because the peer teachers were not experts, they were able to understand what the basics are. They were able to dumb things down and make silly mnemonics, thus creating an easier way to remember things. The peer teachers were able to alleviate the fears and anxiety about medical school. They were able to provide more accurately what to expect in the upcoming year. The first year students felt that the second year students were on their side.

The peer teachers promoted collaboration, camaraderie among the learners. They provided different teaching styles than the faculty. They quiz the learners during the peer teaching session. The peer teachers felt a sense of fulfillment from helping others. By teaching they were more motivated to learn at a deeper level. Some peer teacher's felt they connected better with the first year students than the faculty. Teacher and learner experience proves to be cognitively and socially congruent during peer teaching. (Lockspeiser, O'Sullivan, Teherani, & Muller, 2008**). A** trained instructor will conduct the training sessions and do the data collection.

Learning led by peers can be as effective as when lead by an instructor; sometimes those tutored by peers can learn as well if not better than when taught by a teacher (Greenwood, Dinwiddie, Terry, Wade, Stanley, Thibadeau & Delquardi, 1984). A more conducive learning environment is created when the element of power, domination, or authority does not exist in peer teaching situations (Boud, Cohen, & Sampson, 2001). Current examples of peer teaching are noted in programs at university settings, schools, the Peace Corps, community settings, informal networks, and fraternal groups like Big Brother & Big Sister (Vorrath & Brendtro, 1985). The population being targeted is what determines the setting. Community settings are the best way to reach risky groups, such

as a gay pub to educate on HIV. Other places where people tend to congregate are appropriate for informal peer teaching (Turner & Shepherd, 1999). Therefore, using peer teaching in a residential rehabilitation center is appropriate.

Peer teaching is a useful approach for conveying information when conventional teacher-student approach is not successful or feasible. There are other advantages for implementing peer teaching. Financially, it is more cost-effective and utilizes a means of sharing information and advice already established. Psychologically it is beneficial to those providing the teaching because people identify with their peers. Peer educators perceive themselves as positive role models and may be more accepted when information is presented by a peer. Intellectually peers are a credible source of information and peers reinforce learning through daily contact (Clements & Buczkiewicz, 1993; HEA, 1993; Kelly et al., 1991; Phelps, Mellanby, Crichton, & Tripp, 1994; Rhodes, 1994). An example where peer led teaching has greater impact than teacher led teaching is in the use and attitudes toward drugs (Linsey, 1997).

"Espirit de corps" (morale) in peer tutors is built through peer teaching (Guy, 2002) and is considered to be empowering for those involved in the process (Bandura, 1977a). Peer teaching is also effective because participants have faced the same challenges in the same context; they speak the same language (Boud, Cohen, & Sampson 2001; Kelly et al., 1991; Peers, Ledwith, & Johnston, 1993). In support group environments there are opportunities for peer teaching to occur spontaneously, learning takes place through listening to how others resolved similar incidents. The ID/SA mother experiences a dramatic increase in self-esteem along with a greater sense of knowledge of parenting and parenting skills when attending a group of women sharing parenting

experiences (Policy Research Associates, 1999). Peer modeling is more effective in increasing self-efficacy and gaining achievement than when the modeling is from a teacher (Schunk & Hanson, 1985).

Self-Efficacy

Self-efficacy is the belief that relates to how well people think they can execute an action to achieve life tasks based on the interpretations of their previous performances, past experiences, observations, and modeling of others (Bandura, 1997). Of all the motivational constructs, i.e., self-regulated learning, achievement goal orientation, computer-mediated communications, etcetera; self-efficacy has proven to be the most consistent predictor of behavioral outcomes (Graham & Weiner, 1996; Miltiadou, 1999). Human functioning is a product of a dynamic interplay of personal, behavioral, and environmental influences (Bandura, 1986). The choices people make and the course of action they follow is dependent upon their self-efficacy (Pajares, 2005). Reality is that humans are faced with a multitude of different situations, sometimes on a daily basis. This causes one to take various courses of action.

Self efficacy is more situational. Depending on how you perceive the situation, is what determines what motivation, if any will take place. An increase in self-efficacy will facilitate cognitive processes and performance in different settings. General self-efficacy aims at a more global and stable sense of personal competence to act effectively in a wide range of stressful or new situations (Scholz, Guitierrez-Doña, Sud, & Schwarzer, 2002).

Because life tasks are constantly changing, levels in self-efficacy vary depending on the complexity of the task (Bandura, 1982). Efficacy expectation is what determines how much effort is expended and/or how long the effort will be sustained. Self-efficacy

increases as people put into practice socially learned behaviors they think will be effective (Bandura, 1977b). The stronger the self-efficacy, the stronger is the commitment to persevering when faced with challenging goals (Bandura, 1977a).

Using the information sources in Bandura's social learning analysis is the best way to measure the self-efficacy level. One of the key information sources is performance accomplishments. It uses the modeling approach where participants learn how to deal with specific situations, therefore decreasing fear and stress with future similar events (Bandura, Jeffery, & Gajdos, 1975). Another information source, emotional arousal, is triggered by stressful and taxing situations. High arousal usually debilitates performance and fear of failure elevates levels of anxiety which further decrease the perception of executing an action (Bandura, 1977a). Promoting an efficacious outlook produces personal accomplishments, reduces stress and lowers vulnerability to depression (Bandura, 1994). Increased serenity leads to less harsh parenting practices that might escalate into abuse (Jones & Prinz, 2005).

The following are empirical studies regarding: self-efficacy and maternal parenting, self-efficacy and maternal child attachment, self-efficacy and peer teaching, and self-efficacy and drug rehabilitation.

Self-Efficacy and Maternal Parenting

A longitudinal study (Gross, Conrad, Fogg & Wothke, 1994) conducted over a year's time, looked at self-efficacy and the mother's perception of a difficult child. There were two groups consisting of 126 mothers with one year olds and another group of 126 mothers with 2 year olds. The results showed that the lower the mother's self-efficacy, the higher she rated the child's temperament as being difficult, causing her to have lower

parental self-efficacy. If the mother feels unfit with her parenting skills, the more likely she will feel depressed.

Another longitudinal study by Teti and Gelfand (1991), reported that a significant and positive correlation exists between a mother's self-efficacy and the mother's perception of infant difficulty. The study consisted of 86 mothers and their infants within the first year of life. During recruitment, 48 of the mothers were in therapy for a DSM-III-R diagnosis of depression. The other 38 mothers were from the same areas of the city, but not in any type of therapy. The research consisted of two female research assistants visiting the mothers three times in their home. The research assistants were not aware of the mother's depressive state. During all three visits questionnaire measures were obtained and during the second visit a behavioral observation was done. The observation consisted of two 10-minute session of mother interacting with her infant during feeding and free play with an "Infant Soft Play Set" provided by the assistant. The important finding in this study is that what affected the mother's behavior was her self-efficacy, not her depressive state. The mother's competence level is independent of her emotional state.

The mother's self efficacy not only affects the perception of the degree of infant difficulty, but also what measures the mother will take to handle her infant. Two experiments were conducted on 123 mothers in a laboratory. The first experiment was to measure the mothers' perception of various simulated child cries (frequency and duration). The second experiment was to measure the ability to soothe a crying infant. The results of the soothing ability varied depending on the mothers' self efficacy (Donovan, Leavitt & Taylor, 2005).

Self-Efficacy and Maternal Child Attachment

There is limited research on maternal self efficacy and maternal child attachment. The literature combines maternal child attachment with parenting, since the mother's perceived self efficacy is an important component of whether or not she responds appropriately to her infant's cues (Donovan, Leavitt & Walsh, 1987). A study conducted by Donovan & Leavitt (1989), evaluated the self efficacy of 48 mothers. The mean age was 29.5 years and all had at least graduated from high school. These mothers had to do two visits to the laboratory. On the first visit, after filling out the questionnaires they participated in a simulated child-care task in order to assess their perception of an objective control over the termination of an infant cry. Physiological evaluation was also obtained, cardiac rate was monitored by electrocardiogram. The second visit was done approximately year later, where two questionnaires were administered to asses security of mother-infant attachment. The research concluded that mothers with low self efficacy had insecurely attached infants.

Self-Efficacy and Peer Teaching

Peer teaching can not take place unless there is proximity between the peer teacher and the learner. According to Vygotsky's theory 1962 (which complements Bandura's social learning), peer teaching is more psychologically acceptable and easier to accomplish among the learners because they are in each other's zone of proximal development. Watters & Ginns (1997) found that 124 first year students who were peer taught by third year students, increased their self efficacy and confidence, improved attitudes toward learning and science, and achieved higher grades.

Bandura (1997) suggests that efficacy increases when one sees or visualizes people similar to oneself performing a task successfully. This creates in the observers a sense that they possess the capabilities to master similar activities. Murphey and Arao (2001) conducted a study in Nanzan University in Japan in the late 1990s with 115 first year students watching a video of second through fourth year students talking about learning English. These students completed a pre and post test evaluating their positive beliefs on learning English. All the students entertained the idea that they too could become English speakers. Also these beliefs and motivations seemed lasting, which may further intensify the student's investment in learning.

. However, Bandura (1977) highlights that what increases efficacy more is performance accomplishment not vicarious experience, because they are based on one's own personal experiences. Research on peer teaching in higher education consistently indicates that both the teacher and the learner experience significant gains in learning due to collaborative interaction (Whitman, 1988). Vygotsky (1962) beliefs that much of what fuels our beliefs in our abilities to do things begin intermentally (between minds in an activity), then becomes intramental as one steps metaphorically in to the place of others.

Self-Efficacy and Drug Rehabilitation

Drug rehabilitation centers can increase one's self efficacy through group therapy sessions. A study conducted through Wayne State University (Washington, 2004), showed significant differences between the control group and the treatment group. The treatment groups had higher general self efficacy scores. Increasing the general self efficacy of the chemically dependent women allows her to deal effectively with a variety of tasks and situations; making them more productive and able to accomplish their goals.

Drug rehabilitation centers worldwide can influence self efficacy. Lirtmunlikaporn (2004), conducted a study in Thailand where 438 adolescents in a boot camp were administered a pre and post test. There was a significant increase in the participants' self efficacy, treatment and motivation. When there is low self efficacy, there is high drug use. McKay et al's 1997 study reveled that low self efficacy predicted more cocaine and alcohol use.

A study done in Australia (Sitharthan & Kavanagh, 1991) revealed that by measuring self efficacy, predictions of alcohol drinking over a 6 month follow up can be made. In California, a study conducted by Brown, Carrello, Vik and Porter (1998), looked at 101 men and women in a treatment program to see if there was a correlation between self efficacy and alcohol effect expectancies. They concluded that both self efficacy and expectancies would be useful factors to focus on in an alcohol treatment center.

Residential Rehabilitation Programs

Residential rehabilitation programs that are designed for the ID/SA mother, that include her children and family are perceived to be more positive by the participants (Kunkel, 2002;Tanner, 1996). Residential rehabilitation programs, also known as therapeutic communities, have existed for 40 years. In the United States, there are 315 residential facilities that have beds for pregnant/postpartum women and their children per email received from Mr. Bob Mason (2006).

At a more local level, here in south Florida there is a residential drug rehabilitation center that was founded in 1995 in Fort Lauderdale. It opened its doors

with five mothers and six children. Approximately 4 years ago the center moved to Pembroke Pines and in the fiscal year of 2006-2007 it served 148 families. Since the center opened its doors it has served over 500 families. The programs' goal is for mothers and children to live a responsible drug-free life. The ID/SA mother can enter treatment voluntary or court appointed. She and her children can stay up to 18 months. The programs are composed of licensed clinical psychologists, therapists with special licensures, social workers, and other related personnel. The center incorporates services to include not only 12 step meetings, but also spiritual groups, exercise classes and transportation services (Susan B Anthony, 2006).

There is a significantly better outcome in long term residential programs than in ones with a shorter length of stay (Simpson, Brown & Joe, 1997). With time these mothers are able to handle more and more responsibilities, while contributing to the community they are living in (Narconon of Southern California, 2008). Participants who were in the program three or more months reported better self-respect, consistency in performance, ability to convey feelings and cope with responsibilities (Meredith, 1981).

While the ID/SA mother is in the long-term program bestowing knowledge of parenting skills on her not only benefits the child, but also improves the mother's sense of competence by giving her alternative ways of raising her child (Zuckerman & Bersnahan, 1991). Rehabilitation programs that nurture choice and autonomy promote responsibility and self-empowerment (Robitschek & Kashubeck, 1999). Parenting practices influence a child's development, environment, and well being; which can lead to lifelong effects on the child (Landry, Smith & Swank, 2003). Providing parenting knowledge to ID/SA mothers will improve the maternal-child dyad (Kumpfer & Alvarado, 2003; Nixon,

Sweeney, Erickson & Touyz, 2003). Parental involvement in the children's education is important in helping promote positive attitudes and behaviors. Later it enables the children to have better grades and seek postsecondary education (Garcia, 2004). Teaching the ID/SA mother infant massage techniques as one of the parental skills can improve infant development and mother-infant interaction (Onozawa, Glover, Adams, Modi & Kumar, 2001; Underdown, Barlow, Chung, & Stewart-Brown, 2006). In the rehabilitation program peer teaching of infant massage techniques can easily take place among the residents, since the ID/SA mothers are in contact with each other all the time.

Infant Massage

Because of the premature birth complications, the intrauterine drug exposed infant is usually admitted to the neonatal intensive care unit of a hospital. Throughout their first weeks or months of life these infants are placed in incubators with minimal environmental stimuli and human touch. The only touch they receive daily is to be assessed with gloves and hard equipment, e.g., stethoscopes machines, and needle sticks. Even the infant's feedings are done through a tube that is in the infant's mouth or nose (Nemours Foundation, 2007).

Infant massage not only benefits the premature infant, but all infants. Garmy (2007) provides an overview of infant massage studies involving randomized and clinical controlled trials that were done between 1995 and 2005. The major physical findings showed that through infant massage the preterm and full term infants had increased protection against infections and they gained weight. Behaviorally, the infants' sleep patterns improved, the analgesic effect sometimes soothed the colicky infant. Infant massage research has encouraged a movement towards complementary and alternative

medical therapies (CAM) on special needs, well children and adolescents with ADHD, eating disorders, and other conditions (Rosen & Breuner, 2007).

Through massage the cocaine-exposed infants can gain 47% more weight, perform better on the Brazelton Neonatal Behavior Assessment Scale, and have more organized motor behavior. Also 8 months later the massaged infants performed better on the Bayley Mental and Motor Scales (Field, 2002). Another study conducted at George Washington University Hospital and Children's National Medical Center in Washington, D.C. showed length and head circumference growth and an increase in bone mineral density. All results were associated with the use of massage therapy (Field, 2002).

Infant massage has been practiced in many countries for centuries. Infant massage differs from adult massage, since the intention is to communicate warmth and gentleness to the infant. The strokes are slow, gentle, and rhythmic with just enough pressure to stimulate circulation, while conveying love and confidence (McClure, 2000). The infant massage techniques are made up of various cultural practices. For example, there is an adaptation from gentle yoga movements and Swedish and East Indian massage. The strokes vary from relaxing to light kneading and gentle squeezing (Kelly, 2008).

Infant massage does not only have physical and emotional benefits to the infant but also to the person providing the massage techniques. Bonding through touch is a biological response. When the mother touches her infant a hormone called oxytocin is released in both the mother and the infant. This hormone facilitates recognition and trust, which are key elements in building bonding/attachment between mother and infant (Reese & Storm, 2008).

A study was conducted with 34 primiparous depressed mothers who were randomly assigned to a support group or an infant massage class for five week sessions. A pre and post Edinburgh Postnatal Depression Scale was administered. After comparing the scores a significant improvement in the mother-infant interaction was noted in the group that participated in the infant massage classes. These results suggest that learning infant massage techniques by mothers with postpartum depression will facilitate the mother infant interaction (Onozawa, Glover, Adams, Modi & Kumar, 2001).

McClure (2000) stated the following:

"The art of baby massage teaches parents how to give and receive nurturing."

Summary

Chapter 2 reveals that even though ID/SA has existed since before the time of Christ, it is only in the 20th century that studies have shown the negative effects of illicit drugs and substance abuse on infants. Neonatal intensive care units have been assisting ID/SA infants for the past 30 years (Charsha, 2004). There has been an increase in ID/SA use by persons over the age of 12 leading to a global concern for the younger generation and their offspring. Even though ID/SA is lower in women than men, it is still a worldwide concern. Countries like Afghanistan, Chile, India, Iran, Kenya, are all reporting ID/SA among its people. The type of ID/SA that is dominant may vary depending on the country, some countries have more of a problem with heroin, others with poly substance, etcetera (United Nations, 2004). This in turn creates a financial burden to society when infants are born with physical and cognitive complications that require lengthy hospitalization and extensive physical rehabilitation.

Education is needed for ID/SA mothers caring for their infant with special needs. The ID/SA mother struggles with wanting to be a good parent for her infant/child and parenting enhancement education through peer teaching can provide this opportunity. Empowering ID/SA mothers will increase their self-efficacy that in turn will allow the mothers to tackle any challenges encountered along the way and feel they are a fit mother to their infant (Bandura, 1994). The increased self-efficacy will encourage the mother to interact more with her infant, hopefully encouraging an increase in mother-infant attachment.

In chapter 3, the research methods, the research design, population, sample, instruments, procedures, data analysis, data management and limitations will be discussed. Chapter 4 presents the findings of the study and chapter 5 concludes the study with a summary, implications and recommendations for future studies.

CHAPTER III

METHOD

This chapter presents the purpose of the study and the research hypotheses again, followed by a description of the research design, research population and sample, and research instruments. The chapter concludes by presenting the data collection procedures, data analysis and data management, limitations, and summary.

Purpose of the Study

The purpose of this experimental study was to investigate if there was an increase in self-efficacy and maternal infant bonding/attachment during peer teaching of infant massage among illicit drug/substance abuse (ID/SA) mothers in a residential rehabilitation program.

Hypotheses

H_1. ID/SA mothers who have participated in peer teaching of infant massage will report higher levels of self-efficacy than those mothers who have not participated.

H_2. ID/SA mothers who have participated in peer teaching of infant massage will report higher levels of bonding/attachment with their infant than those mothers who have not participated.

Research Design

The purpose of an experimental design is to determine the cause of events and to predict similar events in the future (Merriam & Simpson, 2000). This research design employed a control group and an experimental group that established cause and effect between the independent and dependent variables. The key to experimental design is that

the participants are *randomly* assigned into groups. Giving one group an intervention and withholding intervention from another group facilitates assessment of the impact of that intervention (Creswell, 2005; Merriam & Simpson, 2000). Experimental design can be very cost effective and time efficient because groups are treated or controlled at one time. ID/SA mothers in this study were selected because it was a convenience sample where the researcher had easy and quick access (Creswell, 2005). An experimental design was used in this study to determine peer teaching of infant massage effect on rehabilitating ID/SA mothers' self efficacy and maternal infant bonding/attachment.

The participants were assigned randomly to treatment groups. Random assignment evenly distributes the personal characteristics of the participants, creating equality in the groups and eliminating extraneous characteristics of the participants that might affect the outcomes (Creswell, 2005). The best quantitative design to establish probable cause and effect is experimental because it controls for possible extraneous factors (Creswell, 2005); at the same time, making it possible to predict events in similar situations, without physically observing those events (Merriam & Simpson, 2000).

Human Participant Protections Education for Research Completion Certificate was obtained from the National Institute of Health (NIH) on August 1, 2005. This information, along with the required application and documentation, was submitted and approved by Florida International University's Institutional Review Board.

Research Population

The population of interest was ID/SA mothers living with their infants/children in a rehabilitation center. As recent as 2 years ago there were only 315 residential drug

rehabilitating facilities in the United States that have beds for the pregnant/postpartum women and their children (Mason, 2006).

Sample

A convenience sample was used due to a limited number of rehabilitation centers that house ID/SA mothers with their infants, in Broward County, Florida. Currently in Florida, there are only 12 residential drug rehabilitation centers with residential beds for the clients' children, but only two centers are located in Broward County (US Drug Rehab Centers, 2009).

In general, a convenience sample was selected because the participants were pre-existing and were willing and available to be studied (Creswell, 2005). The sample size was based on various factors. For example, if there is a limited number of participants who are conveniently accessible or if there are funding limitations (Creswell, 2005). An overall sample size of at least 30 participants was obtained, with 15 randomly assigned members in both the control and experimental groups. For statistical analysis purposes, Creswell (2005) recommends at least 15 participants per group. The sample consisted of women who resided in a drug rehabilitation center, were caring for an infant less than one-year old, and were medically stable. The mothers were ambulatory and capable of performing activities of daily living. The type of ID/SA was not a factor in determining participation in this study.

Instruments

The two standardized instruments used for the study were additive scales: the General Self-Efficacy Scale (GSE**;** Schwarzer & Jerusalem, 1995), and the Revised Maternal Attachment Inventory (R-MAI**;** Muller, 1994). All instruments were chosen for

their ease of administration, comprehension, and use; theoretical base development, and high reliability and validity estimates.

General Self-Efficacy Scale

The General Self-Efficacy scale (GSE) was used to measure the ID/SA mother's self-efficacy (Appendix B). The General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995) measures a broad and stable sense of personal competence to deal efficiently with a variety of stressful situations. This scale was designed to assess self-efficacy in adults and adolescents to predict ability to cope with daily challenges, as well as adaptive behavior after experiencing stressful life events. Because GSE is geared for daily challenges, the scale was administered immediately on day one and day four of the teachings to assess the general feeling.

This self-administered 20-item scale was originally developed in 1979 by Mathias Jerusalem and Ralf Schwarzer; in 1981, they reduced their scale10 items. Responses are based on a 4-point Likert scale. The scale anchors range from 1 = *Not at all true* to 4 = *Exactly true*. Final scores range from 10 to 40, with no item recoding required.

The GSE (Schwarzer & Jerusalem, 1995) has been used in several studies in many different countries and in 27 different languages. Cronbach's alphas ranging from .75 to .94. The criterion-related validity has positive coefficients for social support (r=0.67), optimism (r=0.56) and negative coefficients with anxiety (r=0.77-0.83) and depression (r=0.70-0.86) (Luszczynska, Gutierrez-Doña & Schwarzer, 2005; Scholz, Gutierrez-Doña, Sud & Schwarzer, 2002). Schwarzer and Scholz conducted a multicultural study in 2002, where the variables had similar psychometric properties as other previous studies, thereby supporting the reliability and validity estimates of the

instrument (Luszczynska, Scholz & Schwarzer, 2005). In this study, the Cronbach's alpha of the GSE was .98 on the Pre-test and .82 on the Post-test, respectively. The reliability coefficients, then, are consistent with previously reported research with the measure (e.g., Jerusalem & Schwarzer, 1992).

Revised Maternal Attachment Inventory

The Maternal Attachment Inventory was used to measure bonding between the ID/SA mother and her infant (Appendix C). A mother's affectionate attachment to her newborn is considered a major contributor to developing a healthy child with subsequent healthy attachments**.** Thus**,** the Maternal Attachment Inventory-Revised (MAI-R) was an appropriate scale to administer during this study (Bowlby, 1988; Koniak-Griffin, 1993). The MAI-R is used to provide a practical measure of maternal affectionate attachment. Instruments like the MAI that measure maternal attitudes and feelings may provide more information than merely observing an interaction between mother and infant in the days following delivery [$r=.65$, $p<.01$] (Muller, 1994). Originally, it was a 31-item measurement tool, revised to a 26 items. The 4-point Likert scale's anchors range from a = *Almost Always* to d = *Almost Never* (Muller, 1994). Muller reports that the MAI has a Cronbach's alpha of .85 and claims that its validity is indicated by the strength of its scores' predicted correlations to scores from other instruments. For instance, Postnatal Maternal Attitudes and Maternal Adjustment Scale (PPMAMA) scores correlated positively with MAI scores. MAI scores also correlated positively with How I Feel About the Baby Now (HIFBN) and negatively with Maternal Separation Anxiety Scale (MSAS) scores. Evidence of test-retest reliability is hard to obtain, because it is expected to change with time (Muller, 1994). A correlation between Prenatal Attachment Inventory

(PAI) and MAI scores was found [r=0.41, p< 0.001] (Muller, 1996).). For the current study, the Cronbach's alphas for the MAI scale were as follows: .91 Pre-test; .98 Post-test. Thus, the reliability coefficients are consistent with previously reported research with the measure (e.g., Muller, 1994).

Demographic Questionnaire

The demographic questionnaire was used to measure the ages of the ID/SA mothers (Appendix A). The demographic questionnaire is a set of questions used to assess personal background and behavioral characteristics. People who have the same demographic characteristics tend to have similar opinions on social issues. Frequently, some of the questions could have been sensitive, for example, inquiring about alcohol abuse, prostitution, etcetera. Most of the time the questions were easy to answer, but there were other questions that could have been difficult for some participants to answer comfortably, for example annual income (Creswell, 2005).

Data Collection Procedures

This section presents the data collection, data analysis, data management procedures, and limitations.

Data Collection

The data collection consisted of three parts: site selection, pilot study, and administration of the instruments.

Site selection. A telephone conversation transpired with the Director of a residential drug rehabilitating center in Broward County, Florida. To be clear, this was a convenience sample (Creswell, 2005) where the researcher had accessibility and a rapport with the staff at the rehabilitation center. The purpose of the study, an outline of the

process, and time allocated for obtaining the data was explained. A face-to-face appointment with the Director of the rehabilitating center was arranged to further explain the purpose of the study, benefits to the center and to the participants. To begin the data collection, appointments were scheduled at a convenient time for mothers, their infants and the organization. The data collection pre and post-intervention took place in the facility by the researcher.

The residential rehabilitation center requires that the ID/SA woman be detoxed from drugs and alcohol and must be pregnant or have at least one child up to the age of 9 years. Mothers are allowed to have up to three children living with them. Urine drug screening is performed upon admission into the program. These ID/SA mothers can have a drug felony and be court ordered to the center, or they can come in voluntarily. Other ID/SA mothers come as a transfer from another rehabilitation unit. Voluntary mothers can stay up to 6 months, whereas court ordered mothers can remain up to 9 months.

Once admitted to this rehabilitation program, there are levels that the mothers need to navigate through. There are two entry levels, Orientation or Omega. The mother is placed in Omega if she tests positive for drug/alcohol. This level provides extra supportive classes concerning the use of drugs/alcohol. Level I allow family and friends to visit on weekends. Level II the mothers are allowed to use a cell phone, watch television, have private visitation and are granted a maximum of 5 hours off campus, but facility must know where the mothers are going and what they are doing. Level III mothers may have their own car and can have a pass off campus for up to 7 hours. Finally level IV the mothers are allowed to have an overnight pass.

There are criteria to achieve for moving from one level to the next. The mother must fill out a level movement application, must attend approximately 90 group classes, for a total of 1200 points. Points can also be given for following the dress code, wearing a name tag and doing chores. A commitment paper must be written by the mother on any of the following subjects: responsibility, cooperation, gratitude or citizenship. These mothers must also pay a $55 money order. The money is placed in a savings account and given to them upon completion of the program. If the mothers do not have money to pay, they can apply for cash assistance. Movement between levels should not take any longer than 30 days with the exception of Level III, which requires a 2 month stay. When going off campus on a pass the mother must provide a urine sample for drug screening and do a breathalyzer test to check for consumption of alcohol when she returns to the rehabilitation center.

The center's funding comes from various sources: Department of Corrections, self-pay, Department of Children and Family (DCF), Seminole Tribe, Broward Alcohol Rehab Center (BARC) and Hart (a homeless program). The rehabilitation center was founded in 1995, as a non-profit organization and has the capacity to house 64 families simultaneously.

Program protocol. Initially three questionnaires, the General Self-Efficacy Scale (GSE), Maternal Attachment Inventory-Revised (MAI), and a demographic survey were administered to all participants in the intervention and control groups on day one of the sessions. At the completion of the peer-teaching sessions, two of the same questionnaires (GSE and MAI-R) were administered again. A pretest and posttest allows the researcher

the ability to measure some characteristic in the participants before and after they receive the intervention (Creswell, 2005).

Weekly 1 hour infant massage sessions were scheduled consecutively. A certified infant massage instructor facilitated specific infant massage routines on a doll and return demonstrations on an infant were obtained from the mothers. The strokes were practiced by the participants until the instructor deemed they had returned demonstration successfully. This was assessed by the mothers being able to perform the strokes with fluidity, not having to look down at the sheet with the sequence of the strokes or asking the instructor for clarification. The group size consisted of four to six mothers with their infants. All participants had 100% attendance. This protocol was based on Porter and Porter's (2004) infant massage-parenting enhancement program for recovering substance abusing mothers.

After each weekly session, the ID/SA mother then taught the learned massage strokes for 30 minutes to her roommate in the rehabilitation residence. The researcher oversaw that the half-hour peer teaching part of the intervention took place by a weekly report from the "house mother" in the residence. The "house mother" is an employee of the rehabilitation center, who supervises the ID/SA mothers when they are in their residence. The house mother was trained using the same protocol as the participants. This was done in a separate session that did not include the ID/SA mothers. At the end of the training session a return demonstration from the house mother was observed. A performance checklist was also administered to ascertain the house mother's readiness to observe the ID/SA mother peer teaching the infant massage strokes (Appendix D).

Table 1.

Peer-Tutoring Program for Infant Massage among Rehabilitating Mothers

Session	Intervention
One	Research battery administered (pre-tests)
	Definition & benefits of infant massage
	Preparing the environment
	Deep breathing for relaxation
	Asking permission
	Removal of infant's clothing
	Use of oil
	Beginning hand placement
	Massage of lower extremities (7 components)
Two	Abdominal and chest strokes (6 components)
	Face (2 components)
Three	Head and upper extremity strokes (7 components)
	Back strokes (4 components)
Four	Completion of Research battery (post-tests)
	Give certificate of completion

Finally, all participants were given a certificate of completion, as per Porter and Porter's (2004) protocol. Finally, at the conclusion of the study since there was evidence of increased general self-efficacy and maternal bonding/attachment, the control group was offered the opportunity to participate in the peer teaching of infant massage program.

Expert reviewers. To establish expert judge validity, three experts reviewed the test questions for issues of content related to study. The demographic information form was based on Porter & Porter 2004. Feedback was taken and integrated into the study as appropriate. To make changes based on feedback at least two of the three reviewers had to agree. There was an overall agreement of 98%.

Pilot study. A pilot study was done by a separate group of five colleagues. They determined how long it takes to complete the questionnaires and if that time was reasonable. Grammar was checked, questions were assessed for complexity or ambiguity and clarity of directions (Creswell, 2005; Peat, Mellis,Williams, & Xuan, 2002; Tejlingen, Rennie, Hundley & Graham, 2001). It was estimated that the questionnaires would take between 10 to 20 minutes for participants to complete.

Data collection protocol. Due to the limited number of residents in the center, the study had one experimental group (n=15) and one control group (n=15). The participants were randomly assigned to the groups. Random assignment distributes any bias in personal characteristics of individuals equally among the groups (Creswell, 2005). Each participant was assigned a number; a random number generator was used to randomize the participants. The first 15 were assigned to the control group and the remaining 15 numbers were assigned to the experimental group. Both instruments and a demographic questionnaire were administered to each participant in each group in the rehabilitating center. This data collection protocol was derived from Porter and Porter's (2004) study. All participants were informed about the purpose and nature of the research. They were told that confidentiality would be maintained (e.g., participants were identified by a code number; responses of the individuals were not known to anyone who evaluated them). A written consent was obtained (consent letter see Appendix E). Withdrawal from the study without penalty, should they so choose, was also explained in the consent form.

Data Analysis

All quantitative data were entered into a Statistical Package for the Social Sciences (SPSS) 15.0 database. Characteristics of the groups was analyzed using

descriptive statistics. These included participant's age, education, race, socioeconomic, status, first time in program vs. readmission to program, number of children, number of years and frequency of ID/SA. These demographic characteristics were examined for the purposes of comparing this study's findings with prior research. The data were analyzed using frequency counts as well as measures of central tendency. To test hypotheses one and two, the researcher employed an analysis of covariance analytic procedure (ANCOVA). An ANCOVA analyzes and quantifies statistical differences between one or more variables while holding one or more variable constant (Cone & Foster, 1993). An ANCOVA statistically controls for a variable that might introduce bias into a study. In this study, for instance, age was used as a covariate to statistically control for its possible effects on general self-efficacy and attachment/bonding scores (Porter & Porter, 2004).

Data Management

All completed instruments are kept in a locked file cabinet in the researcher's home office. As per university policy, all instruments will be kept for 3 years from the completion of the study (Florida International University Regulations for Thesis and Dissertation Preparation Manual, 2007).

Limitations

Data assumption are, because both measures are closed questionnaires, there is limited opportunity for in-depth response from the participants; thus, making the questions seem inflexible. Surveys may not capture the context of social life or what the participants may be doing at that moment (Babbie, 2004; Merriam & Simpson, 2000). If it is not a well constructed instrument, measurement error increases (Salant & Dillman, 1994). Doing a pilot test first will enhance the probability that the survey questions are

clear to the participants; reassuring the participants that there are no wrong or right answers and allowing the participants ample time to answer the questions are a few ways to reduce the bias in self-reports.

There is some question regarding the validity of self-reporting surveys because participants may respond as they think they should respond (social desirability) rather than providing an accurate answer. This especially occurs when reporting on something illegal such as, ID/SA. (Harrell, 1985). Another example reported by Dobbins, Farh and Werbel (1993) revealed that students with low GPA scores tend to report inflated scores, in the attempt to maintain social desirability.

Babor and DelBoca (1992) identified other limitations such as personal characteristics of the participant (are they sober) and the time relevance of the reporting event (last month vs. childhood). However in spite of these possible limitations, Freier, Bell, and Ellickson (1991) and other researchers suggest that self-report data can be quite accurate. A study conducted by Aitken et al's 2004, demonstrated that among 2,704 participants, there was a 93.7% concordance between self-report and medical record data.

Other limitations may include there not being a large number of residential drug rehabilitating centers in Broward County, Florida, therefore affecting sample size, and that participants must be in an inpatient program. Future studies should be conducted in non-residential centers and with outpatient programs.

Summary

Chapter 3 detailed the research processes including the research design including, sampling and population, instruments used, and procedures for data collection and analysis. Using ANCOVA statistical procedures reduces bias when comparing intact

groups, such as a classroom. It is a very powerful test when conducting an experimental study (Stevens, 1999). Chapter 4 presents the findings of the study, and chapter 5 concludes the study with a summary, implications, and recommendations.

CHAPTER IV

DATA ANALYSIS

This chapter presents four sections on the interpretation of the findings. The first section includes descriptive statistics, such as using frequency (*f*) counts to indicate general tendencies in the data (Babbie, 2004; Creswell, 2005; Merriam & Simpson, 2000). Following is a section on inferential statistics using chi square (χ^2) to determine any significant differences among the groups and enabling the researcher to draw conclusions about the unknown population (Babbie, 2004). The next section discusses hypotheses 1 and 2. This section includes a description of one-way analysis of covariance analytic procedure (ANCOVA) used to test both hypotheses. The ANCOVA analyzes and quantifies statistical differences between one or more variables and statistically controls for a variable that might introduce bias into a study (Cone & Foster, 1993). The chapter concludes with a summary of the results.

All quantitative data was entered in Statistical Package for the Social Sciences (SPSS) 15.0 database from Excel. The participants were *randomly* assigned into two groups. Fifteen participants were given an intervention (group 2) and another 15 participants were part of the control group (group 1). Each participant was then provided with an equal probability for selection and equal distribution of any variability that existed between or among the groups (Babbie, 2004; Creswell, 2005; Merriam & Simpson, 2000). Giving one group an intervention and withholding intervention from another group facilitates assessment of the impact of that intervention (Creswell, 2005; Merriam & Simpson, 2000).

Descriptive Statistics

This section provides general descriptions of both experimental and control groups. General description of the data was collected from a demographic survey containing 18 questions. Some of the questions required multiple answers. The participant's characteristics were reported in two categories background and sensitive issues.

Background Questions

The participant's background, i.e., age, marital status, number of children, education, income, race/ethnicity, religion, living arrangements, etc. will be assessed in these first 10 questions.

Age

Thirty women responded to the survey. Two (6.67%) participants were between 15 to 19 years of age and seven (23.33%), were aged 20 to 24. Twelve (40%) participants were aged 25 to 29. Six of the women (20%) were aged 30 to 34 and three (10%), were between the ages of 35-39. Table 2 provides complete information of participants' ages. See Figure 1, Appendix F for the age breakdown for both groups combined.

Marital Status

Of the 30 participants, three (10%) of the women are married, twenty-five (83.33%) are single and two (6.67%) are divorced. Table 3 provides complete information on marital status. See Figure 2, Appendix F for the marital status of both groups combined.

Number of Children

Nine (33%) of the participants had a single child, eleven (36.67%) had two children and four (13.33%) had three children. Six (19.99%) of the participants had four or more children. Table 4 provides complete information of the participant's number of children. See Figure 3, Appendix F for the number of children for both groups combined.

Table 2

Age of Participants (*N = 30*)

Age	Group 1	Group 2
	f	*f*
19	1	1
20	0	2
21	1	1
22	1	0
24	1	1
25	1	0
26	2	1
27	2	2
28	3	1
30	1	1
31	1	1
32	1	0
34	0	1
38	0	2
39	0	1

Table 3

Marital Status (N=30)

Marital Status	Group 1	Group 2
	f	*f*
Single	12	13
Married	2	1
Divorced	1	1

Table 4

Number of Children (N=30)

Children	Group 1	Group 2
	f	*f*
1	2	7
2	9	2
3	2	2
4	1	3
5	0	1
6	1	0

Education

One (33.33%) of the participants had 6 or less years of education and eighteen (60%) had 7 to 12 years of education. Four (13.33%) attended a technical/vocational school and seven (23.34%) attended college or graduate school. Table 5 provides complete information regarding the participants' education. See Figure 5, Appendix F for the educational level of both groups combined.

Table 5

Education (N=30)

Education	Group 1	Group 2
	f	*f*
0-6 years	1	0
7-12 years	9	9
Technical/Vocational	3	1
College	2	3
Graduate Degree	0	2

Income

Twenty-five (83.33%) of the participants had an income that did not exceed $10,000. Two (6.67%) had an income between $11 and 20,000 and two (6.67%) had an income between $21 and 30,000. The remaining participant (33.3%) reported an income above $60,000. Table 6 provides complete information about income. See Figure 6, Appendix F for the income of both groups combined.

Table 6

Income (N=30)

Income	Group 1	Group 2
	f	*f*
$10,000	12	13
$11,000-$20,000	1	1
$21,000-$30,000	2	0
Above $60,000	0	1

Race/Ethnicity

Twelve (40%) of the participants reported their race/ethnicity as White, eleven (36.67%) reported Black, four (13.33%) were Hispanic, and two (6.67%) were Native American. The one (3.33%) reporting "Other" stated she was Jamaican. Table 7 provides complete information on race/ethnicity. See Figure 7, Appendix F for the race/ethnicity of both groups combined.

Table 7

Race/Ethnicity (N=30)

Race/Ethnicity	Group 1	Group 2
	f	*f*
Black	7	4
Hispanic	2	2
Native American	1	1
White	4	8
Other	1	0

Category "Other" = Jamaican

Religious Practice

Half of the participants reported practicing some form of formal religion and the remainder did not engage in any type of formal religion. Table 8 provides complete information on religious practice.

Table 8

Religion (N=30)

Religion	Group 1	Group 2
	f	*f*
Yes	9	6
No	6	9

Living Arrangement

Before entering the residential treatment center, fourteen (46.67%) of the women lived alone with their infant/child. Two (6.67%) lived with a spouse and one (3.33%) resided with her parent. One (3.33%) lived with other relatives and the remainder of the women, twelve (40%) reported being homeless. Table 9 provides complete information on previous living arrangements. See Figure 8, Appendix F for the living arrangements of both groups combined.

Table 9

Living Arrangement (N=30)

Residence	Group 1	Group 2
	f	*f*
Living alone with infant	9	5
Living with spouse	0	2
Living with parent	1	0
Homeless	4	8
Living with other relatives	1	0

Medical Care

The majority of participants, seventeen (56.67%) visited a private doctor for medical care. Seven (23.33%) used a clinic setting for medical care and six (20%) went to the hospital/ER for treatment. Table 10 provides complete information on medical care. See Figure 9, Appendix F for the types of medical care for both groups combined.

Table 10

Medical Care (N=30)

Medical Care	Group 1	Group 2
	f	*f*
Clinic	3	4
Private Doctor	10	7
Hospital/ER	2	4

Government Assistance

Several forms of government assistance were available and used by the participants. Three (10%) participants used no assistance and two (6.67%) only used food stamps. The remainder, twenty-five (83.33%), used a combination of several government programs. Table 11 provides complete information on Government Assistance. See Figure 10, Appendix F for the number of government assistance programs for both groups combined.

Table 11

Government Assistance (N=30)

Government Assistance	Group 1	Group 2
	f	*f*
Food Stamps	2	0
No	1	2
2 types of assistance selected	3	1
3 types of assistance selected	7	10
4 types of assistance selected	2	2

Other government assistance programs available:
Medicaid
Women Infant and Children (WIC)
Cash Assist
Temporary Assistance for Needy Families (TANF)

Sensitive Questions

The more sensitive questions included illicit drug and substance abuse, abortions/miscarriages, delivery of infant, and breastfeeding,

Use of Street Drugs

All participants but one (96.67%) in the study used street drugs. Table 12 provides complete information. See Figure 11, Appendix F for the use of street drugs of both groups combined.

Table 12

Use Street Drugs (N=30)

Use Street Drugs	Group 1 *f*	Group 2 *f*
Yes	15	14
No	0	1

Age Began Use of Street Drugs

One (3.45%) participant reported the earliest use of street drugs beginning between the ages of 5 to 9 years old. Fourteen (48.28%) of the women began using street drugs between the ages of 10 to 14 and eleven (37.93%) participants were between 15 to 19 years of age. Two (6.90%) participants started using between the ages of 20 to 24 and one (3.45%) began between the ages of 25 to 29. Table 13 provides complete information about the age the women first used street drugs. See Figure 12, Appendix F for the age when both groups combined, first used street drugs.

Use of Prescription Drugs for Non-Medical Purposes

Eighteen (60%) of the participants took prescriptions for non-medical purposes and twelve (40%) denied use. Table 14 provides complete information. See Figure 13, Appendix F for the use of prescription drugs for non-medical purposes of both groups combined.

Age Began Use of Prescription Drugs for Non-Medical Purposes

Five (27.78%) participants began the use of prescription drugs for non-medical purposes between the ages of 10 to 14. Seven (38.89%) were between the ages of 15 to 19. Four (22.22%) were between the ages of 20 to 24 and two (11.11%) participants were aged 25 to 29 years of age. Table 15 provides complete information. See Figure 14, Appendix F for the age when both groups combined, first used prescription drugs for non-medical purposes.

Use of Alcohol

Twenty-eight (93.33%) of the participants used alcohol and two (6.67%) denied its use. Table 16 provides complete information. See Figure 15, Appendix F for the use of alcohol of both groups combined.

Age First Use of Alcohol

Two (7.14%) participants began the use of alcohol between the ages of 5 to 9. Sixteen (57.14%) used alcohol between the ages of 10 to 14. Nine (32.14%) started between ages 15 to 19 and one (3.57) began between ages 20 to 24. Table 17 provides detailed information. See Figure 16, Appendix F for the age when both groups combined, first used alcohol.

Table 13

Age First Use Street Drugs (N=29)

Age	Group 1	Group 2
	f	*f*
6	0	1
10	1	0
11	0	1
12	5	1
13	2	3
14	1	0
15	1	2
16	0	1
17	1	1
18	1	1
19	1	2
21	1	0
22	1	0
26	0	1

Table 14

Use Prescription Drugs Non-Medical (N=30)

Use Prescription Drugs Non-Medical	Group 1	Group 2
	f	*f*
Yes	9	9
No	6	6

Table 15

Age First Use Prescription Drugs Non-Medical (N=18)

Age	Group 1	Group 2
	f	*f*
11	0	1
12	0	2
14	1	1
15	1	2
16	0	1
17	1	1
19	1	0
21	1	0
22	2	0
23	1	0
25	0	1
28	1	0

Use of Tobacco Products

Twenty-five (83.33%) of the 30 participants used tobacco products. Five (16.67%) denied ever using tobacco. Table 18 provides detailed information. See Figure 17, Appendix F for the use of tobacco products of both groups combined.

Table 16

Use of Alcohol (N=30)

Use of Alcohol	Group 1	Group 2
	f	*f*
Yes	15	13
No	0	2

Table 17

Age First Use of Alcohol (N=28)

Age	Group 1	Group 2
	f	*f*
6	0	1
8	1	0
10	1	1
11	0	1
12	3	1
13	4	2
14	0	3
16	0	1
17	3	2
18	1	0
19	2	0
21	0	1

Table 18

Tobacco Use (N=30)

Tobacco Use	Group 1	Group 2
	f	*f*
Yes	12	13
No	3	2

Age Began Tobacco Use

One (4%) participant began using tobacco between the ages 5 to 9. Fourteen (56%) started the use of tobacco between the ages 10 to 14 and nine (36%) were between the ages 15 to 19. One participant (4%) began between the ages of 20 to 24. Table 19

provides detailed information. See Figure 18, Appendix F for the age when both groups combined, first used tobacco.

Number of Abortions/Miscarriages

Twelve (40%) of the participants had one to two abortions/miscarriages. Eight (26.67%) had three to four and two (6.67%) reported five or more. Eight denied ever having an abortion or miscarriage (26.67%). Table 20 provides detailed information. See Figure 4, Appendix F for the number of abortions/miscarriages for both groups combined.

Table 19

Age First Use Tobacco (N=25)

Age	Group 1	Group 2
	f	*f*
8	1	0
10	2	0
11	1	2
12	1	2
13	2	3
14	1	0
15	1	1
16	1	2
17	1	1
18	1	1
20	0	1

Gestation

Twenty-six (86.67%) of the infants/children were full term and four (13.33%) were premature. Table 21 provides detailed information. See Figure 19, Appendix F for the number of full term/premature births for both groups combined.

Table 20

Number of Abortions/Miscarriages (N=25)

Number of Abortions/ Miscarriages	Group 1 *f*	Group 2 *f*
None	4	4
1-2	5	7
3-4	5	3
5 or more	1	1

Table 21

Gestation (N=30)

Term	Group 1 *f*	Group 2 *f*
Full	14	12
Premature	1	3

The tables above present descriptive statistics for demographic questions in the survey of this study. The information was reported by each of the participants in both groups. Group 1 represents the frequency (*f)* in the control group and group 2 represents the frequency (*f*) in the experimental group. The tables determine overall trends and distribution of the data (Creswell, 2005).

Inferential Statistics

In this section the inferential statistics used was chi-square (χ^2) to test the null hypotheses (H_o). This determined if there were significant differences between the groups. Inferential statistical process is used in drawing conclusions about a population from a sample size (Creswell, 2005). Table 22 provides detailed information.

From the reported (χ^2) results, no statistical demographic differences exist between the experimental group and the control group that could effect the results. There is a failure to reject the null hypothesis (H_o) since all *p* values were greater than .05.

Table 22

Pearson Chi-Square Summary Table

Variable	χ^2 Value	*df*	*p*
Time in Facility (months)	1.974	3	.578
Level	4.291	5	.508
Program Before	.240	1	.624
Age	10.33	14	.737
Marital Status	.373	2	.830
Children	10.232	5	.069
Miscarriages/Abortion	.833	3	.841
Education	4.200	4	.380
Income	3.040	3	.385
Race	3.152	4	.533
Religion	1.200	1	.273
Residence	6.476	4	.166
Medical Care	1.339	2	.512
Government Assistance	3.863	4	.425
Street Drugs	1.034	1	.309
Frequency of Use	3.381	4	.496
Age First Used	12.533	14	.564
Last Used	1.422	3	.700
Prescription Non Medical Use	.000	1	1.000
Frequency of Use	3.060	4	.548
Age First Used	11.333	12	.501
Last Used	1.424	3	.700
Alcohol	2.143	1	.143
Frequency of Use	1.137	3	.768
Age First Used	13.849	12	.310
Last Used	5.048	4	.282
Tobacco	.533	2	.766
When stop smoking	.750	1	.386
Frequency of Use	3.255	2	.196
Age First Used	7.174	11	.785
Breastfeeding	.000	1	1.000
Frequency	1.333	2	.513
Baby Delivery	2.222	1	.136
Gestation	1.154	1	.283

α= .05

Hypotheses

H_1 stated that illicit drug/substance abuse (ID/SA) mothers who participated in peer teaching of infant massage would report higher levels of self-efficacy than those mothers who did not participate. Tables 24 provides detailed information using a one-way ANCOVA statistical analysis on the post-test scores for the GSE instrument and Table 23 provides detailed information using a one-way ANCOVA statistical analysis on the pre-test scores for the GSE instrument.

Table 23

One-Way ANCOVA Pre-Test GSE Scores

Source	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.
Corrected Model	8.983a	2	4.492	0.246	0.783
Intercept	1219.712	1	1219.712	66.870	0.000
Age	7.783	1	7.783	0.427	0.519
Group	0.351	1	0.351	0.019	0.891
Error	492.483	27	18.240		
Total	29084.000	30			
Corrected Total	501.467	29			

Table 24

One-Way ANCOVA Post-Test GSE Scores

Source	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.
Corrected Model	267.408a	2	133.704	6.525	0.005
Intercept	1484.746	1	1484.746	72.454	0.000
Age	26.575	1	26.575	1.297	0.265
Group	261.781	1	261.781	12.775	0.001
Error	553.292	27	20.492		
Total	31733.000	30			
Corrected Total	820.700	29			

Conducting a one-way analysis of covariance (ANCOVA) on the post test demonstrated a significant difference on GSE scores between the control group and the experimental group, F= 12.775, df =1, p = 0.001. Hypothesis 1 was supported such that the treatment group scored higher than the control group when age was used as a continuous covariant and the ANCOVA reported that age had no significant impact on the control group or experimental group, F = 1.297, df =1, p = 0.265.

H_2 stated that the ID/SA mothers who participated in peer teaching of infant massage would report higher levels of bonding/attachment with their infant than those mothers who did not participate. Tables 26 provides detailed information using a one-way ANCOVA statistical analysis on the post-test scores for the MAI instrument and Table 25 provides detailed information using the statistical analysis one-way ANCOVA on the pre-test for the MAI instrument.

Table 25

One-Way ANCOVA Pre-Test MAI Scores

Source	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.
Corrected Model	456.654a	2	228.327	1.616	0.217
Intercept	10273.784	1	10273.784	72.716	0.000
Age	0.354	1	0.354	0.003	0.960
Group	438.094	1	438.094	3.101	0.090
Error	3814.715	27	141.286		
Total	291021	30			
Corrected Total	4271.367	29			

Table 26

One-Way ANCOVA Post-Test MAI Scores

Source	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.
Corrected Model	1020.848a	2	510.424	4.148	0.027
Intercept	10283.836	1	10283.836	83.580	0.000
Age	0.014	1	0.014	0.000	0.991
Group	988.526	1	988.526	8.034	0.009
Error	3322.119	27	123.041		
Total	288751.000	30			
Corrected Total	4342.967	29			

Conducting a one-way analysis of covariance (ANCOVA) on the post test scores demonstrated in a significant difference on the MAI scores between the control group and the experimental group, $F = 8.034$, $df = 1$, $p = 0.009$. Hypothesis 2 was supported such that the treatment group scored higher than the control group when age was used as a continuous covariant and the ANCOVA reported that age had no significant impact on the control group or experimental group, $F = 0.000$, $df = 1$, $p = 0.991$.

Summary

This chapter presented the results of a true experimental study using random assignment and homogeneity of variance. Results strongly support both hypotheses H_1 and H_2, with statistical findings indicating that the peer teaching intervention caused the general self-efficacy and the maternal bonding scores to increase. There was no significant difference on the demographic and background variables between the experimental and control groups. A one-way ANCOVA was performed to control for the continuous variable of age on the total post score. Findings revealed that age had no impact on the groups' scores. Chapter 5 will discuss the findings, present the summary,

purpose of the study, implications for practice, and the limitations of the study. The chapter concludes with recommendations for future research and practice.

CHAPTER 5

DISCUSSION

This chapter is divided into seven sections. The first section is a discussion of the importance of the study findings, followed by a summary, purpose of the study, implications for practice, and limitations of the study. The final section includes recommendations for future research and practice.

Discussion of the Importance of the Study Findings

The use of ID/SA during pregnancy can affect the un-born's chances at life. According to the 2006 March of Dimes report, some of the risks during pregnancy of an illicit drug or abusing substances may lead to a miscarriage, stillbirth, placental problems or premature rupture of membranes. If the fetus survives, the chances are then focused around interaction and relationship building.

Mothers who use illicit drug/substance abuse (ID/SA) have poor parenting attitudes and have low competency scores during mother-child interaction (Schuler, Nair, & Black, 2002). This is a concern when according to the 2008 National Survey on Drug Use and Health, 42.7% of ID/SA users were age 12 or older, and there was an increase in the rate of current use among the females of that age group from 5.8% in 2007 to 6.3% in 2008. The most abused drugs were marijuana and cocaine.

Marijuana was used by 57.3 % as the only illicit drug and 18.4 % used both marijuana and other drugs in the 2008 NSDUH report. When the ID/SA mother smokes marijuana during nursing, THC is passed in concentrated amounts to the baby during breastfeeding. THC affects the infant's motor and nervous system development, causing

behavioral problems during preschool and early school years (NIDA, 2009). The more challenges the ID/SA mother has with her infant, the more she needs to have an increase in general self-efficacy to prevent her from relapsing into drug use to escape the difficult events.

Summary

The demographic findings in this study are congruent with the review of the literature. Illicit drug users were more likely to be single, have less than a high school education and utilize public assistance as a source of income (Slutsker, Smith, Fleming, & Higginson, 1993). Over 83% of the ID/SA mothers that participated in the study had income below $10,000 a year. Recent research concluded that social factors, including social-economic status, are determinants of both risky drug-use behavior and the health consequences of drug use (Galea & Vlahov 2002). Most of the demographic findings in this study were comparable with the 2008 results reported in the national survey conducted by government agencies, for both ID and SA, like alcohol and tobacco use,

Other similarities between the findings in this study and the review of the literature are the abuse of prescription medications for non-medical use. In the study, 60% of the participants used prescription drugs for non-medical use. NSDUH reports that between 2007 to 2008, a 1% increase occurred in lifetime use of pain relievers for non-medical use from 11.8 to 12.7 %. Similarities have been mentioned, but it is important to acknowledge that there also were some differences.

Some of those differences were noted in race/ethnicity. This study reported that 40% of the sample was White, but the national percentage of race/ethnicity was highest among Blacks at 10.1%. Another difference that was noted was in the question about

religion. Half of the ID/SA mothers in the study reported practicing religion. In reviewing the literature, there was an indication that a significant independent variable of abstaining from ID/SA was having strong religious and spiritual support (Avants, Warburton, & Margolin, 2001).

Using the quantitative surveys, this true experimental study sought to determine if peer teaching affected the ID/SA mother's self-efficacy and her maternal-infant attachment. No differences were noted between the demographics of the experimental and the control group. This prevents bias from entering the study (Cone & Foster, 1993).

Purpose of the Study

The purpose of this experimental study was to investigate if there is an increase in self-efficacy and maternal infant bonding/attachment during peer teaching of infant massage among ID/SA mothers in a residential rehabilitation program.

The findings supported both hypotheses, which were based on the purpose of the study. This has importance to adult educators who are involved in rehabilitation programs because the review of the literature shows that bonding and the responsibilities of providing basic care, emotional warmth, stimulation, guidance and boundaries, stability, and ensuring safety are jeopardized when the mother suffers from feelings of abandonment, isolation, loss of child custody, and powerlessness due to ID/SA (Advisory Council on the Misuse of Drugs, ACMD, 2003; Coyer, 2003; Wallace, 1992).

In the first year of life, an infant goes through a stage of emotional development that Erikson identified as trust versus mistrust. This is a time where an infant is totally dependant on others to meet his/her basic needs such as food, cleanliness and comfort from pain or fear. If the maternal-infant attachment is not present during this stage, the

infant starts developing doubts about his or her caregiver and hence mistrust begins. As the maternal-infant attachment increases, the ID/SA mother feels more adequately fit as a parent. These initial effects have future repercussion.

Early maternal infant attachment development, will decrease the risk later on in the child's life for behavioral difficulties at home as well as in school; decrease the risk for physical abuse and create higher self-esteem (Kronstadt, 1991). Believing that one is able to fulfill the responsibilities of caring for an infant is a good indicator of self-efficacy. In Bandura's social learning analysis, one of the key information sources is performance accomplishments (Bandura, Jeffery, & Gajdos, 1975).

Hypothesis 1: ID/SA mothers who have participated in peer teaching of infant massage will report higher levels of self-efficacy, than those mothers who have not participated.

Results from the chi-square analyses showed there were no statistical demographic differences between the experimental and the control group that could affect the results. Because all *p* values were greater than .05, there was a failure to reject the null hypothesis (H_o). A one-way analysis of covariance (ANCOVA) procedure was conducted to help reduce possible bias, using the independent variable peer teaching of infant massage, the dependent variable GSE and the continuous outcome variable of age on the total post score. Evidence supported hypothesis 1 after statistically controlling for age as a covariant. It is important to control for covariates because they have potential influences that could affect the dependant variable. This allows the relationship between the treatment and the outcome to be accurately assessed (Creswell, 2005).

Age is a continuous variable that could have influenced the results. A younger mother may perceive the questions on the survey differently than a mother who is older. Tolerance for infant crying and being fussy can also vary in degree. Peer teaching of infant massage had a significant effect on the ID/SA mother's self-efficacy across the age groups. Bandura (1995) defines self-efficacy as the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations. Being able to support hypothesis one signifies that the ID/SA mother believes that she will be able to better take care of herself and her infant. The theory posits that as the ID/SA mother is able to face the daily challenges and achieve success her self-efficacy increases, giving her a sense of accomplishment. Following the theory the more self-efficacy, the less likely the ID/SA mother will regress to using drugs to escape from difficult tasks of parenting and daily life challenges.

Hypothesis 2: *ID/SA mothers who have participated in peer teaching of infant massage will report higher levels of bonding/attachment, than those mothers who have not participated.*

Results from the chi-square analyses again showed there were no statistical significance differences between the demographics of the experimental and the control group that could affect the results. Because all *p* values were greater than .05, there was a failure to reject the null hypothesis (H_o). A one-way analysis of covariance (ANCOVA) was conducted using the independent variable peer teaching of infant massage, the dependent variable maternal infant attachment and the continuous outcome variable of

age on the total post score. Evidence supported hypothesis 2 after statistically controlling for age as a covariant.

The importance of hypothesis 2 being supported is of great value for healthy child development. One way to break the cycle of addiction is to start life with strong maternal-infant bonding. This can be achieved by the mother having quality time with her infant. Communicating love through touch can fortify the verbal communication of that love. Bonding is a process that grows stronger daily through numerous ways: holding, hugging, bathing, feeding, reading and singing, changing diapers, and responding to various infant cries. Once a mother returns to work, time with her baby becomes about quality not quantity. Bonding is considered a cornerstone because it establishes the basis for a child's emotional and social development and later influences relationships with family, friends, and peers (US Department of Health and Human Services, 1991).

Implications for Practice

This section provides a discussion of implications for practice for (a) mothers, (b) infants, (c) ID/SA rehabilitation program, (d) policy maker, and (e) instructors.

Mothers

The hypothesis that peer teaching of infant massage can increase general self-efficacy was supported; therefore this study can have a positive impact on illicit drug/substance abuse (ID/SA) mothers residing in a drug rehabilitation center. The positive impact occurs by encouraging these mothers to teach each other skills they learned before entering the rehabilitation program. Sometimes it is tips on what their grandmother told them about treating diaper rash, cradle cap, etcetera, and share

experiences and knowledge while in the rehabilitation program. Peer teaching of infant massage can help the mothers increase their self-efficacy, giving them a sense of accomplishment. As the self-efficacy increases, so does the feeling of being able to face and work through future unpredicted situations that would have otherwise felt overbearing and hopeless. When faced in the future with challenging goals, the commitment to persevere is stronger if the self-efficacy is strong (Bandura, 1977a).

The second hypothesis stating that peer teaching of infant massage can increase maternal-infant bonding was also supported through this study. These results create a positive impact on the ID/SA mothers' ability to attach to their infants. This promotes a better relationship between mother and infant. In a previous study, a dramatic increase in self-efficacy along with a greater sense of knowledge of parenting and parenting skills was reported when mothers attended a group of women sharing parenting experiences (Policy Research Associates, 1999).

The findings suggest that in giving we receive. As these mothers felt confident in the skill of infant massage strokes, they were eager to share their knowledge with anyone who wanted to hear about what they had learned. The mothers' self-efficacy increased, empowering them to feel they could teach the healthcare practitioners in the rehabilitation center. There was a sense of camaraderie among the ID/SA mothers within the facility.

Infants

These findings will also have an impact on the babies. Mothers, who feel more nurturing, will likely be less aggressive, and more attentive to their infants. There is less quantity and quality of stimulation towards the infant if the mother has a low self-efficacy, resulting in her being less likely to be attentive to her infant's needs (Patel et al.,

2004). With the mother learning new parenting skills, the infant is less likely to be abused or neglected. This is because high levels of self-efficacy invoke feelings of serenity, which is important when approaching difficult activities, such as parenting (Pajares, 2005).

The children will grow in a more stable environment as the mother develops good coping skills. Every positive outcome will create higher levels of self-efficacy. These high levels of self-efficacy produce feelings of serenity in the ID/SA mother (Pajares, 2005). With a calm environment, it is possible to achieve the psychological effect of the quiet alert state. This is the state in which the infant is most responsive to his or her mother's face voice and touch (Kronstadt, 1991).

ID/SA Rehabilitation Program

With the findings from this study, any administrator of a residential ID/SA rehabilitation center for pregnant women or women who have a newborn, will feel comfortable to implement this simple and low cost program. On admission, the program can evaluate the knowledge base of each resident and offer an opportunity to peer teach the mother skills that she may be interested in learning. Adult educators can also create an environment that facilitates emancipatory learning whereby students engage in dialogue and critical reflection. This enables students to tap into their experiences and raise awareness that can ultimately transform the students' perspectives toward a wider, more contextualized understanding of things (Schreiber, & Banister, 2002). This provides positive re-enforcement for the ID/SA mother's intellectual strengths. This increases her self-efficacy and her mother-infant attachment.

Policy Makers

The study findings contribute to the existing database promoting evidence-based practice in drug rehabilitation centers. It also broadens the current scientific knowledge that nurturing through psychomotor activity, such as infant massage, as part of parenting classes, has an immediate positive effect on both the mother and the infant attachment/bonding. Adding weekly infant massage classes to the drug rehabilitation programs could maintain maternal-infant bonding, decreasing the likelihood of child abuse. Incorporating these findings into maternal-health as well as infant health policy development should be considered and merits attention.

Instructors

These results can help healthcare personnel, such as nurse educators and maternal-child health practitioners, to develop programs in the rehabilitation centers that cultivate an environment where the ID/SA rehabilitating mother can peer teach. Using infant massage as a therapeutic tool can teach these rehabilitating mothers how to create a support system, develop a healthy infant and nurture a more positive relationship with their infants.

Limitations of the Study

This section provides a discussion of limitations of the study for (a) size, and (b) cross-contamination.

Size

One of the limitations in this study was the relatively small sample size of 30 participants. Having at least 15 participants per group for statistical purposes, is considered adequate in an experimental study like this one. Future research should

incorporate procedures to increase sample size for the purpose of further generalization (Creswell, 2005).

The state of Florida has only 12 residential drug rehabilitations centers for mothers and their infants; two of those are in Broward County (U.S. Drug Rehab Centers, 2009). Several programs were contacted but they had closed or had no clients presently in the program. Closing of the facilities was mainly due to governmental cuts in the budget. Another facility, in a neighboring county, never responded to numerous voice mails and messages left with the receptionist.

Cross-Contamination

The two groups reside and attend group sessions in the same facility, creating a potential for the participants to discuss their activities with each other. Biased results could occur due to cross-contamination among the experimental and control groups. Some mothers developed friendships and even established a good support system with each other prior to participation in the study. Though the experimental group mothers were excited about learning infant massage to teach their peers, it was not likely that the second-hand conversations and verbal description of the techniques had a significant impact on the self-efficacy and maternal infant attachment. Rather, the actual peer teaching of the infant massage process makes this study consistent with the literature. Field (2002) has documented the benefits of infant massage on the infant's physical and cognitive development. Further research conducted by Field (2000) reports the significance of touch therapy concerning maternal infant bonding.

The investigator concluded that the experimental results of increased self-efficacy and maternal-infant bonding were due to following the program protocol of small group

teaching sessions. This allotted sufficient time for practice of the strokes and provided constant feedback during the return demonstrations. Some of the advantages of small group teaching is that it allows for participation of everyone, the participants often are more comfortable in smaller groups and they can reach consensus easier (ADPRIMA, 2010).

Longitudinal Measurement

Repeating the GSE and the MAI-R approximately 6 months after the last session of infant massage may result in increased data, as seen in Porter and Porter (2004). However, longitudinal measurement of this population may be difficult to obtain once they are no longer residing in the facility. Some of the ID/SA mothers will leave the program due to successful completion, but may not leave a forwarding address for contact. Others may relapse into drug use, be re-incarcerated or become victims of homicide or commit suicide.

Recommendations for Future Research

Replication of the study in various states with larger sample sizes is recommended to validate and establish generalizability of these findings in a larger global community. Modifying the demographic questionnaire to inquire about other rehabilitation centers attended prior to entering the current program, would be useful in understanding one possible source of differences within the groups.

Doing a longitudinal measurement could report findings of long term impact, if any, of the peer teaching of infant massage on the maternal-infant attachment. This would consist of repeating the GSE and the MAI-R surveys 4 to 6 months after the ID/SA mother had completed week 4.

Mixed methods are recommended for future replication and extension of this study. Observation data should be included in the experimental study in addition to the self-reporting surveys. This can be achieved as the researcher has a participant observer role by being both a participant and recorder of field notes on the behavior and activities between the rehabilitating mother and her infant on multiple visits (Creswell, 2003). Adding a descriptive summary of observations as part of the data collection process, can reveal a more in-depth perspective on the mother and infant relationship. Qualitative research deals with descriptions and in-depth interviewing. It includes data that can be observed but not measured, such as, video and audio recordings, photographs, personal letters, autobiographies and biographies, e-mails and texts, etc. (Creswell, 2003; Patton, 2002).

Several questions can be added to the demographic information form regarding how the ID/SA mother entered the current drug rehabilitation program, such as being voluntary or court ordered, if she has other children, how many of those children was she the primary caregiver for, and what was her support system outside the rehabilitation program. These added questions would provide more information on the participant and further assist the rehabilitation program in planning a more individual educational plan of action.

Another recommendation would be keeping track of how many hours the ID/SA mothers participated in the sessions. Looking at the number of hours the participants attended the sessions could be a variable that impacts the results of the groups. Research shows that the more involved the participant is in the teachings, the better the outcome of the results.

Recommendations for Practice

When teaching the ID/SA mother it is important to coordinate with the rehabilitation center to ensure that the participants do not have any court dates or important appointments (doctor's, government agency, etcetera) scheduled during the teaching session. This would increase the ID/SA mother's concentration. It would also be advisable to schedule two to four alternative dates to complete the teachings with the same format.

In the teaching sessions, the instructor needs to carefully monitor their body language as the ID/SA mothers are interacting with their infants and with other ID/SA mothers. Being perceived as non-threatening will encourage more class participation and attendance, whereby decreasing the attrition rate in the study. To create a more conducive learning environment, the elements of power, domination, and authority must not exist during the teaching session (Boud, Cohen, & Sampson, 2001). Because it is not possible to eliminate elements of power and authority they must be recognized and diminished as much as possible. Some possible ways to diminish power and authority are by using the evocative process whereby the teacher draws forth information from the participant, using the student-centered teaching, which helps the student gain personal, intellectual and interpersonal competencies (Buchanan, 1993) and by giving the participant freedom and autonomy during the educational experience. This will create a more mutual relationship between the teacher and student.

The findings in this study indicated that 50% of the participants participated in some form of religion. In reviewing the literature, religion and secular social capital were

also present (Bartkowski & Xu, 2008), whereby suggesting that religious avenues for the ID/SA rehabilitating mother might be pursued to enhance maternal-infant attachment.

There was a dramatic shift in the ID/SA mother's interaction with her infant that was observed by the drug rehabilitation facility staff. The staff reported seeing the mothers holding and playing more with their infants and yelling at them less. A way to continue maintenance of the infant massage skills, would be to teach the rehabilitation staff the infant massage routine. This way the classes can remain ongoing. Also teaching a group of ID/SA mothers would provide an additional opportunity for peer teaching the other mothers in residence. The ongoing classes in infant massage may encourage the ID/SA mothers to stay in the rehabilitation program longer. This could possibly result in a long term positive effect on their maternal-infant bonding.

As George Herbert once said "One *good mother* is worth a hundred schoolmasters" (Quotegarden, 2009)

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APPENDIX A

DEMOGRAPHIC INFORMATION FORM

DIRECTIONS:

Please answer the following questions for some background information.

Remember all information is confidential.

How long have you been in this facility? _____months

Which level you are currently at in the program?

1_____ 2_____ 3_____ 4_____

Have you ever been in this program before? Yes_____ No_____

1. Age? _____

2. Marital status?
   Single____ Married____ Divorced____ Widow____

3. How many children do you have? _____

4. How many miscarriages and/or abortions have you had?
   None____ 1-2____ 3-4____ 5 or more____

5. How many years of formal education have you had?
   0-6 years____ 7-12 years____ Technical/Vocational ____

   College _____ Graduate/ Degree____

6. What is your yearly income?

   $10,000 or less____ $31,000-$40000____

   $11.000-$20000____ $41,000- $50,000____

   $21,000-$30,000____ $51,000-$60,000____ $61,000 and above____

7. Racial or ethnic background:

   Asian____ Black____ Hispanic____ Native American____

   White/Caucasian____ Other (specify) _____

8. Do you practice a formal Religion?

   Yes____ No____

9. What is your living arrangement?

   Living alone with infant/child(children)_____

   Living with spouse/significant other_____

   Living with parents_____ Living with other relatives/friends_____

   Homeless_____ Other (explain) _____

10. Where do you go for medical care?

    Clinic____ Private Doctor____ Hospital/ER____ Other (explain) ____

11. Do you receive some type of help from the government?

    Food Stamps____ Medicaid____ WIC____ No____

    Other (specify) _____

12. In the past, did you use street drugs?

Yes____ (if no please go to question 13) No____

If yes, how often did you use street drugs?

Daily (every day)____ Weekly (minimum once a week)____

Monthly (minimum once a month)____ Occasionally (explain)_____

What type of street drugs did you use?

Marijuana____ Cocaine____ Crack____ Heroin____

Other (specify) _____

At what age did you first use street drugs? _____

When did you last use street drugs? Choose one answer.

Yesterday____ Last week____ 2 weeks ago____

Last month____ More than 6 months____

13. In the past, did you use prescription drugs for non medical purposes?

Yes____ (if no please go to question 14) No____

If yes, how often did use prescription drugs for non medical purposes?

Daily (every day)____ Weekly (minimum once a week) ____

Monthly (minimum once a month)____ Occasionally (explain)____

What type of prescription drugs did you use? Check all that apply.

OxyContin____ Vicodin____ Percocet____ Percodan____ Lortab____

Lorcet____ Tylox____ Dilaudid____ Librium____ Valium____

Xanax____ Adderall____ Concerta____ Ritalin____

At what age did you first use prescription drugs for non medical purposes? ____

When did you last use prescription drugs for non medical purposes? Choose one answer.

Yesterday____ Last week____ 2 weeks ago____

Last month____ More than 6 months____

14. In the past, did you drink alcoholic beverages?
Yes____ (if no please go to item15) No____

How would you describe your level of drinking?

Moderate (1 drink per day) ____

Heavy (more than 1 drink per day) ____

Occasional (explain) _____

What type of alcoholic beverage did you usually drink?

Beer____ Wine____ Whiskey____ Vodka____

Other (explain) _____

At what age did you first have an alcoholic beverage? ____

When did you last have an alcoholic drink? Choose one answer.

Yesterday____ Last week____ 2 weeks ago____

Last month____ More than 6 months____

15. Do/Did you smoke tobacco?

Never smoked____

I did smoke but I stopped ____(when did you stop) _____

Yes____ (if yes, please describe)

Cigarettes____ Cigars____ Pipe____ other (explain)

_____

How much do you smoke a day? _____

At what age did you first use tobacco products? ____

16. Are you breast feeding your baby?

Yes____ No____ (if yes, how often do you typically breast feed your baby each day?)

1 time____ 2 times____ 3 times____ 4 times____ as often as needed____

17. How was your baby delivered?

Natural childbirth/Vaginal____ Cesarean____ Forceps____

18. Was your baby:

Full term____ Premature____

Please add any comments you would like to share.

_____

_____

_____

_____

_____

_____

_____

_____

Thank you for participating in this study.

☺

All of the information will remain confidential.

Code Number _____ Date Collected_____ Date Completed _____

Adapted from Porter & Porter 2004

APPENDIX B

The General Self-Efficacy Scale (GSE)

INSTRUCTIONS: Please rate how strongly you agree or disagree with each of the following statements by placing a circle around your number response.

1. I can always manage to solve difficult problems if I try hard enough.

1=	**2 =**	**3 =**	**4 =**
Not at all true	Hardly true	Moderately true	Exactly true

2. If someone opposes me, I can find the means and ways to get what I want.

1=	**2 =**	**3 =**	**4 =**
Not at all true	Hardly true	Moderately true	Exactly true

3. It is easy for me to stick to my aims and accomplish my goals.

1=	**2 =**	**3 =**	**4 =**
Not at all true	Hardly true	Moderately true	Exactly true

4. I am confident that I could deal efficiently with unexpected events.

1=	**2 =**	**3 =**	**4 =**
Not at all true	Hardly true	Moderately true	Exactly true

5. Thanks to my resourcefulness, I know how to handle unforeseen situations.

1=	**2 =**	**3 =**	**4 =**
Not at all true	Hardly true	Moderately true	Exactly true

6. I can solve most problems if I invest the necessary effort.

1=	**2 =**	**3 =**	**4 =**
Not at all true	Hardly true	Moderately true	Exactly true

7. I can remain calm when facing difficulties because I can rely on my coping abilities.

1=	**2 =**	**3 =**	**4 =**
Not at all true	Hardly true	Moderately true	Exactly true

8. When I am confronted with a problem, I can usually find several solutions.

1=	**2 =**	**3 =**	**4 =**
Not at all true	Hardly true	Moderately true	Exactly true

9. If I am in trouble, I can usually think of a solution.

1=	**2 =**	**3 =**	**4 =**
Not at all true	Hardly true	Moderately true	Exactly true

10. I can usually handle whatever comes my way.

1=	**2 =**	**3 =**	**4 =**
Not at all true	Hardly true	Moderately true	Exactly true

Schwarzer, R. & Jerusalem, M. 1995

Code Number _____ Date Collected_____ Date Completed _____

APPENDIX C

MATERNAL ATTACHMENT INVENTORY (Revised)

DIRECTION: The following sentences describe thoughts, feelings, and situations mothers may experience. Place a check under each column opposite to the statement that applies to you.

	Almost Always 4	Often 3	Sometimes 2	Almost Never 1
1. I feel love for my baby.				
2. I feel warm and happy with my baby.				
3. I want to spend special time with my baby.				
4. I look forward to being with my baby.				
5. Just seeing my baby makes me feel good.				
6. I know my baby needs me.				
7. I think my baby is cute.				
8. I'm glad this baby is mine.				
9. I feel special when my baby smiles.				
10. I like to look into my baby's eyes.				
11. I enjoy holding my baby.				
12. I watch my baby sleep.				
13. I want my baby near me.				
14. I tell others about my baby.				

	Almost Always 4	Often 3	Sometimes 2	Almost Never 1
15. It's fun being with my baby.				
16. I enjoy having my baby cuddle with me.				
17. I'm proud of my baby.				
18. I like to see my baby do new things.				
19. My thoughts are full of my baby.				
20. I know my baby's personality.				
21. I want my baby to trust me.				
22. I know I am important to my baby.				
23. I understand my baby's signals.				
24. I give my baby special attention.				
25. I comfort my baby when he/she is crying.				
26. Loving my baby is easy.				

* All items are summed for a single score.

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APPENDIX D

INFANT MASSAGE STROKES PERFORMANCE CHECKLIST

STROKES	P F	STROKES	P F
INDIAN MILKING		OPEN BOOK ON FACE	
SQUEEZE & TWIST		SMALL CIRCLES ON CHEEKS	
THUMBS ON SOLE OF FOOT		CIRCLES AROUND HEAD	
SQUEEZE TOES		PIT STOP	
THUMBS ON DORSAL & ANKLE OF FOOT		INDIAN MILKING	
SWEDISH MASSAGE		SQUEEZE FINGERS	
FEATHER STROKES		THUMBS ON PALM & TOP OF HAND	
WATER WHEEL		SWEDISH MASSAGE	
THUMBS TO SIDES		FEATHER STROKES	
SUN MOON		BACK & FORTH	
I LOVE YOU		SWOOPING TO ANKLES	
OPEN BOOK		SMALL CIRCLES ON BACK	
BUTTERFLY		FEATHER STROKES	

APPENDIX E

Consent Form
Title: The effects of peer teaching of Infant Massage on general self-efficacy and mother infant attachment among mothers in a residential rehabilitation facility for drug Addiction and substance abuse.

You are being asked to participate in a research study. The investigator of this study is Vivian Bango-Sanchez, a student at Florida International University. The purpose of this study is to look at the effects peer teaching will have on general self-efficacy and mother infant attachment while you reside in a residential rehabilitation facility for drug addiction and substance abuse with your infant/child. Your participation will include being part of a one hour class for four weeks. A trained instructor will facilitate specific infant massage routines and return demonstration of the infant massage strokes applied to their own infants will be obtained from the mothers. After each weekly session, the mother will teach the learned massage strokes to her roommate in the rehabilitation residence. This program will provide the opportunity for mothers to gain effective skills for increasing parenting confidence and reinforcing mother infant attachment. Also, it will provide an opportunity to increase morale, personal competence and decrease depression. This form requests your permission to participate in these classes.

No ill effects or complications are expected for you or your infant. If you decide to be a part of the study, you will be asked some background information that will include the past use of illegal drugs or substances. You may refuse to provide information you choose. You will also be asked to fill out three surveys at the beginning of the study and two surveys at the end of the study.

There is no cost or payment to you as a participant. You may withdraw your participation at any time with no negative consequences. All information that pertains to this study will be numbered, locked in an office, and not identifiable to the investigator. The final reports will not use your name in any way. If you would like more information about this research study, you can contact Vivian Bango-Sanchez by email at vbango-sanchez@fiu.edu. If you would like to talk with someone about your rights as a participant of this study, you may contact Dr. Patricia Price, the Chairperson of the FIU Institutional Review Board at 305-348-2618 or 305-348-2494. Your signature below indicates that all of your questions have been answered and that you agree to help in the study.

_____ _____ _____

Participant's Signature Printed Name Date

I have explained the research procedure, subject rights and answered questions asked by the participant. I have offered him/her a copy of this informed consent form.

_____ _____

Witness Date

APPENDIX F

COMBINED FREQUENCIES OF GROUP 1 AND GROUP 2

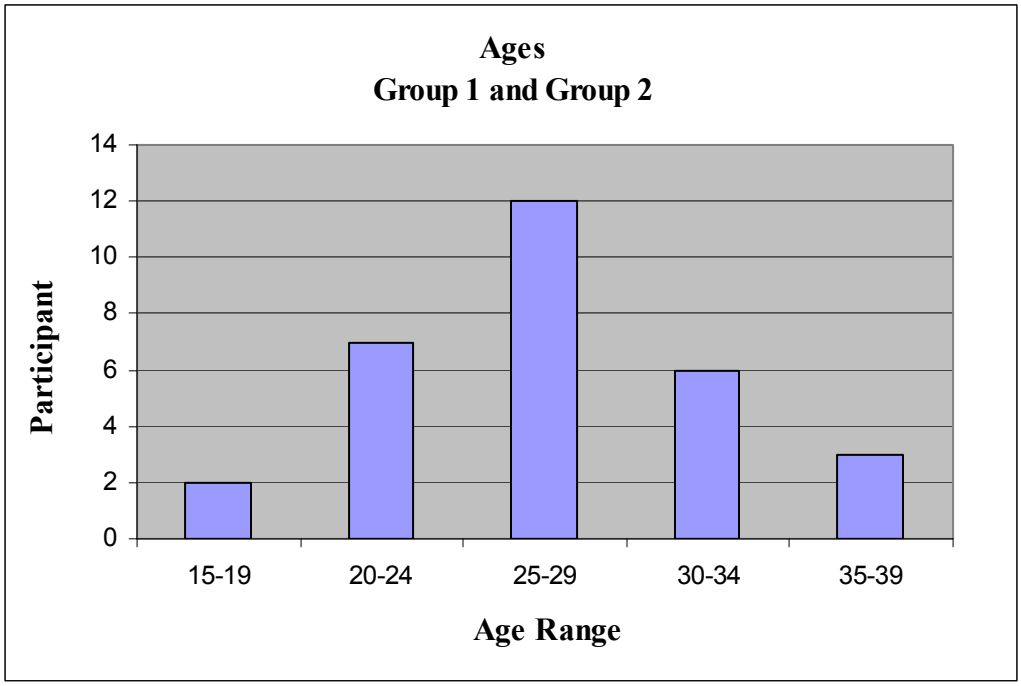

Figure 1. Age of participants from group 1 and group 2.

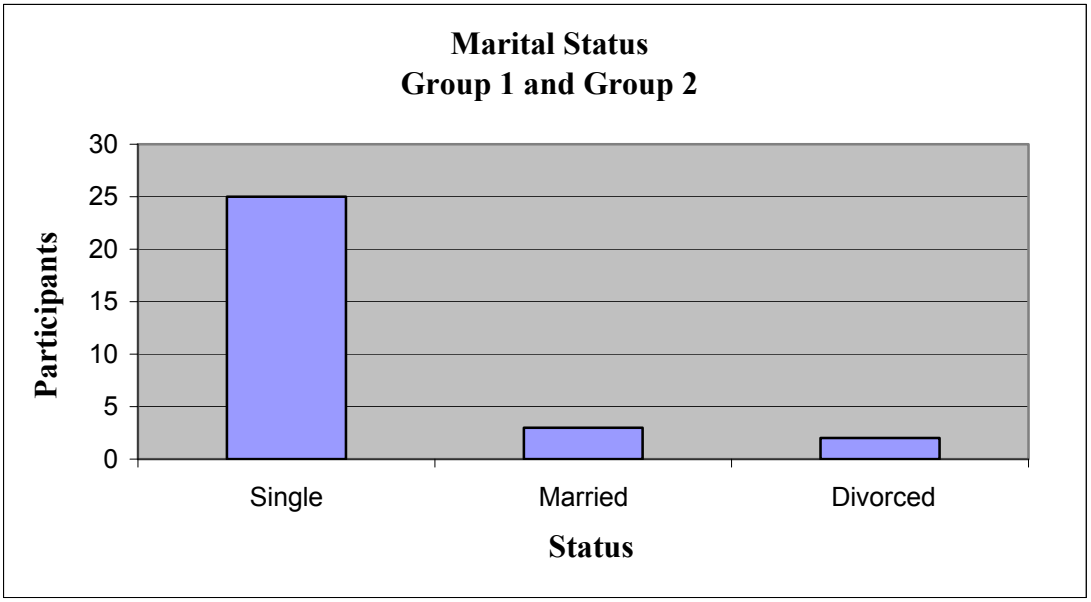

Figure 2. Marital status of participants from group 1 and group 2.

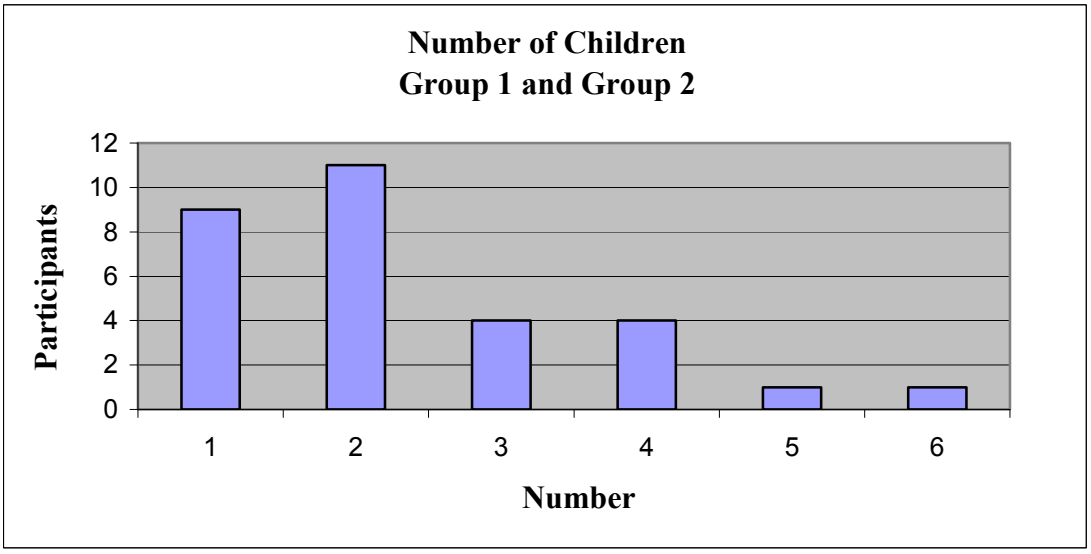

Figure 3. Number of children of participants from group 1 and group 2.

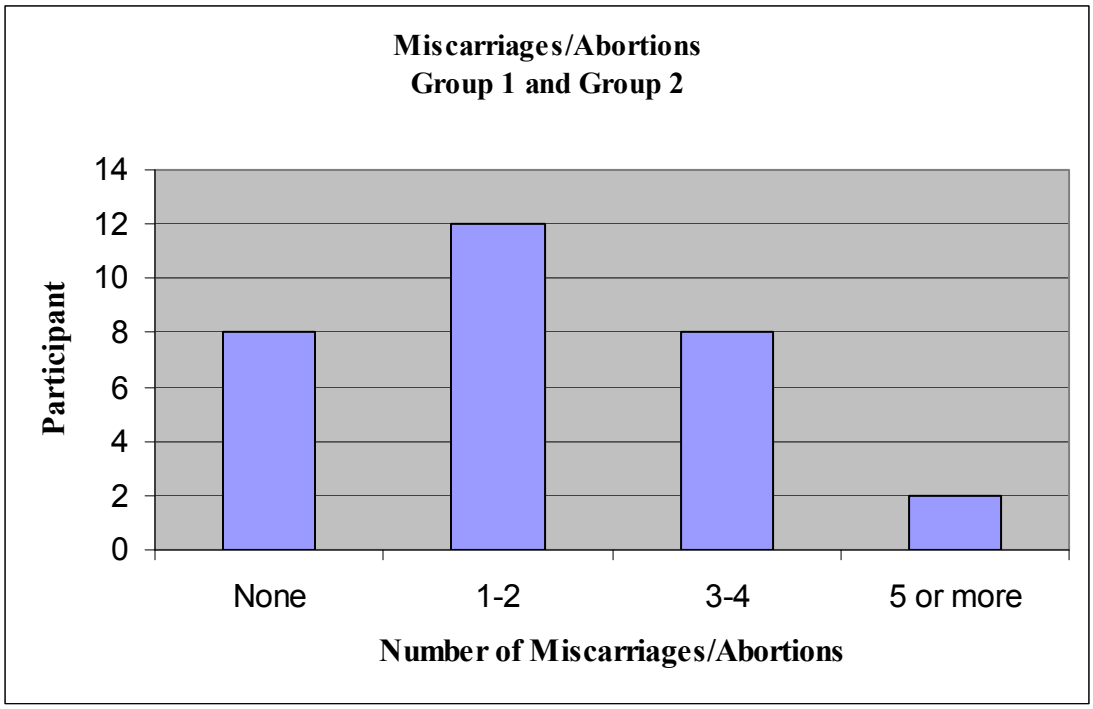

Figure 4. Number of miscarriages/abortions of participants from group 1 and group 2.

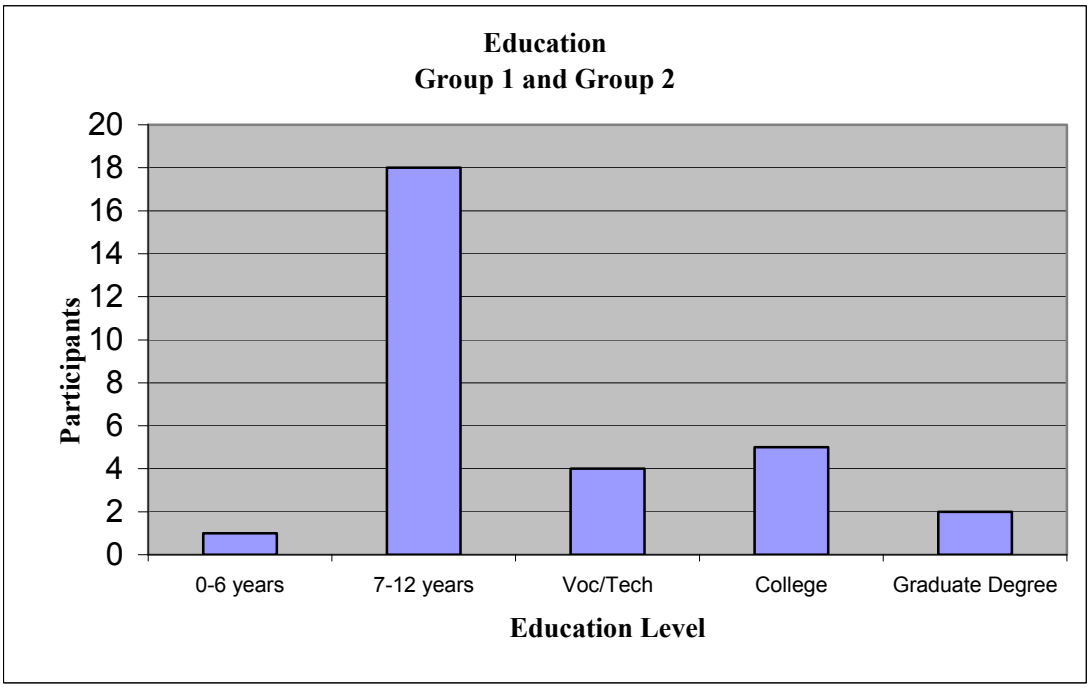

Figure 5. Educational Level of participants from group 1 and group 2.

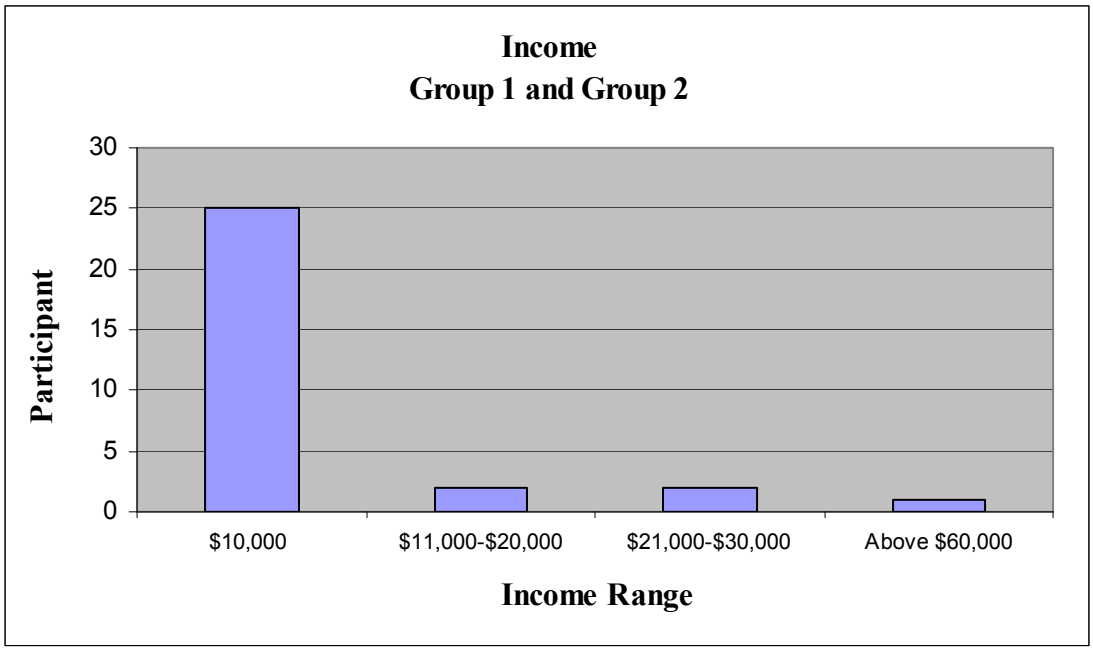

Figure 6. Yearly income of participants from group 1 and group 2.

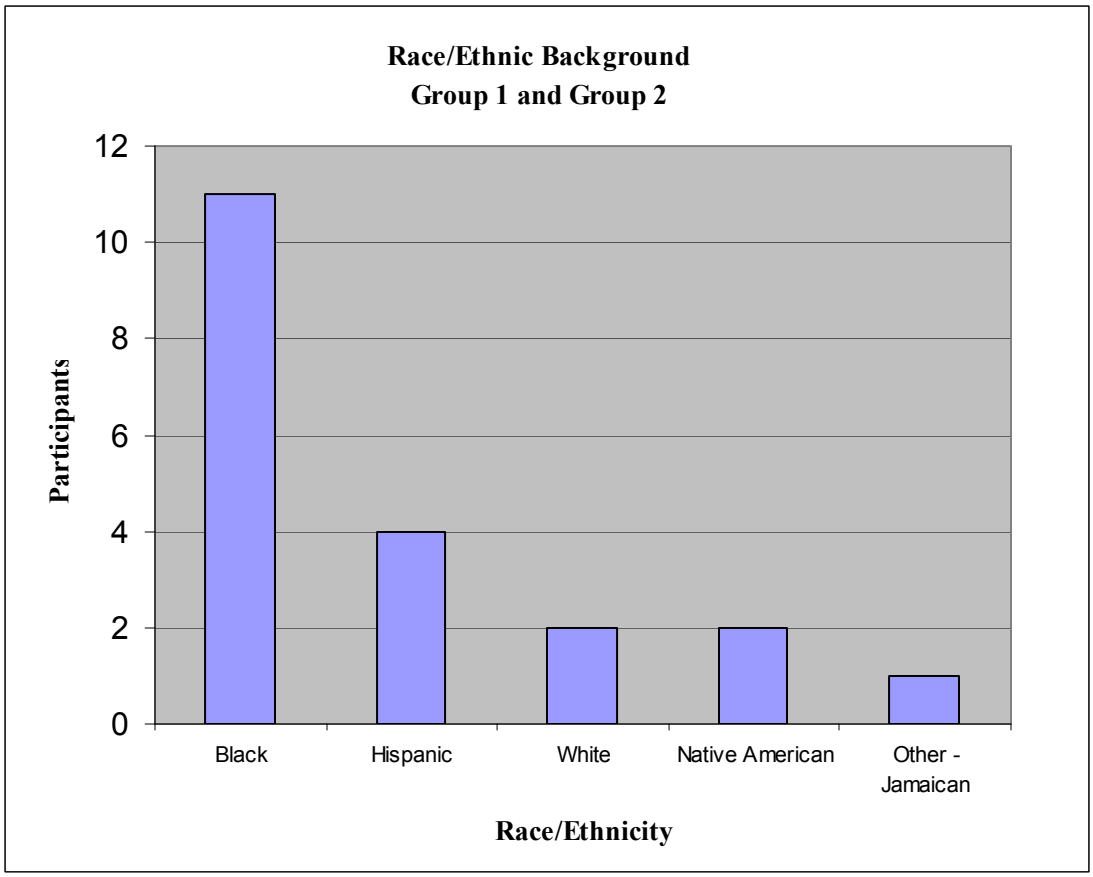

Figure 7. Race/ethnic background of participants from group 1 and group 2.

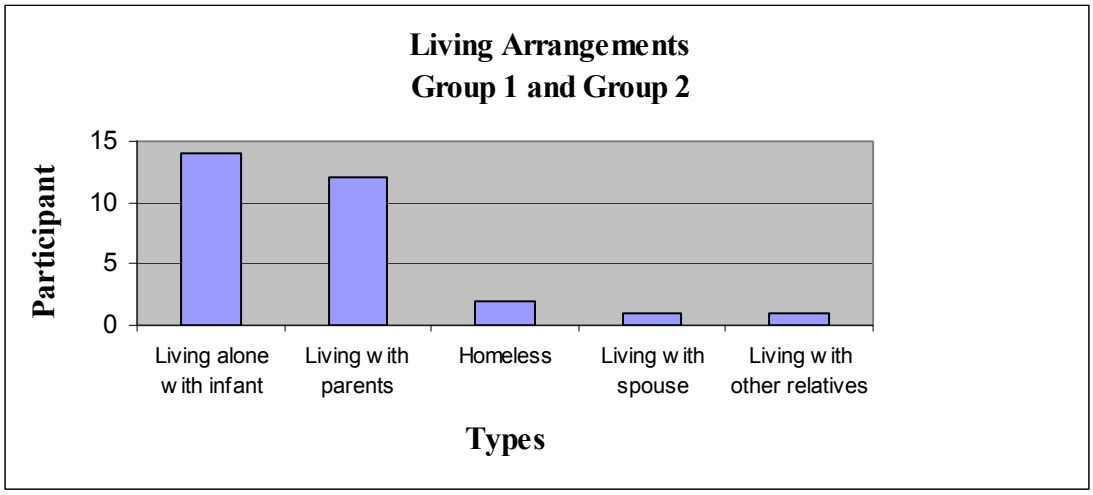

Figure 8. Living arrangements of participants from group 1 and group 2.

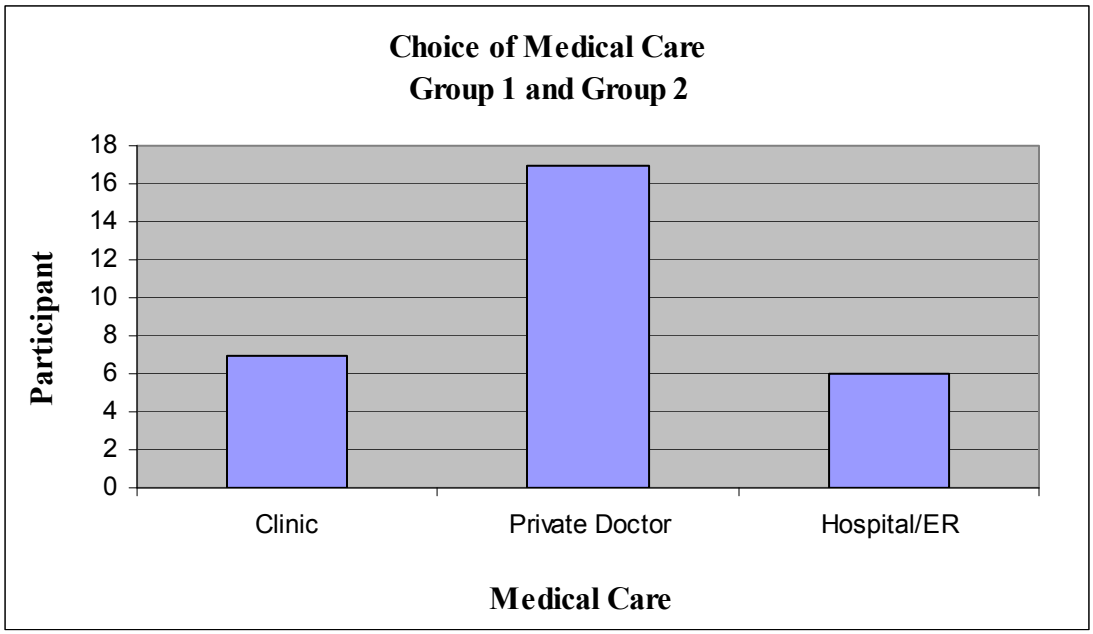

Figure 9. Medical care of participants from group 1 and group 2.

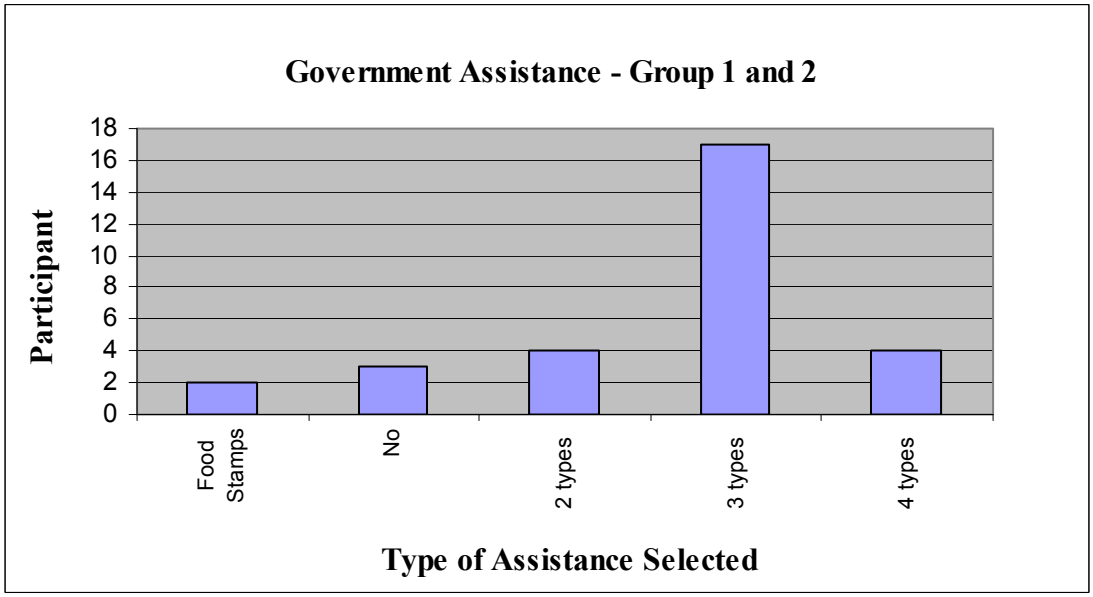

Figure 10. Government assistance received by participants from group 1 and group 2.

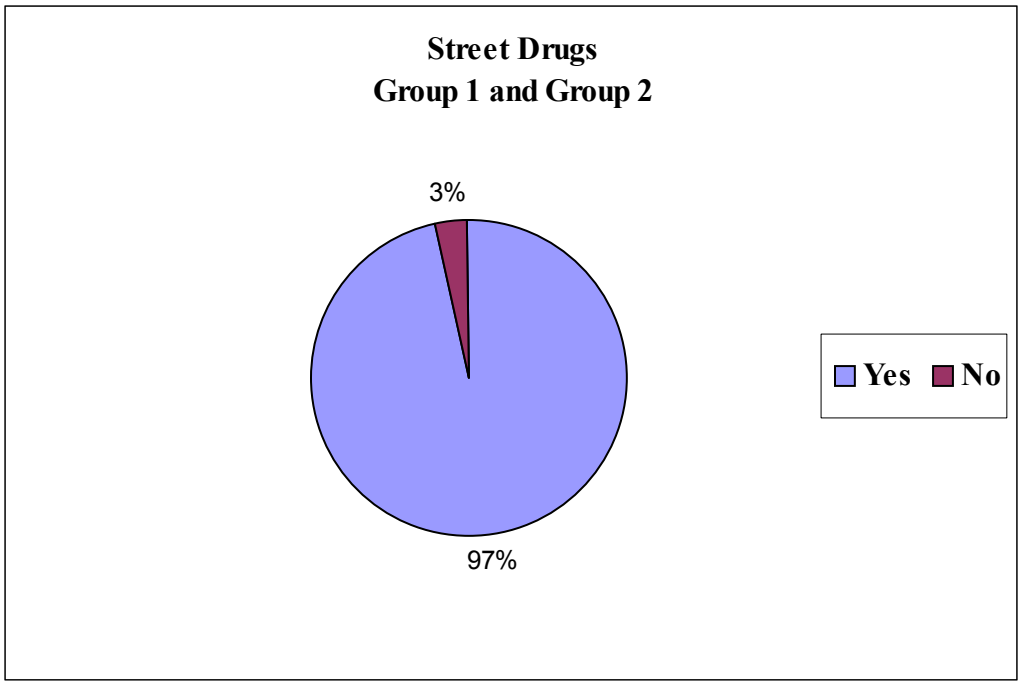

Figure 11. Use of street drugs by participants from group 1 and group 2.

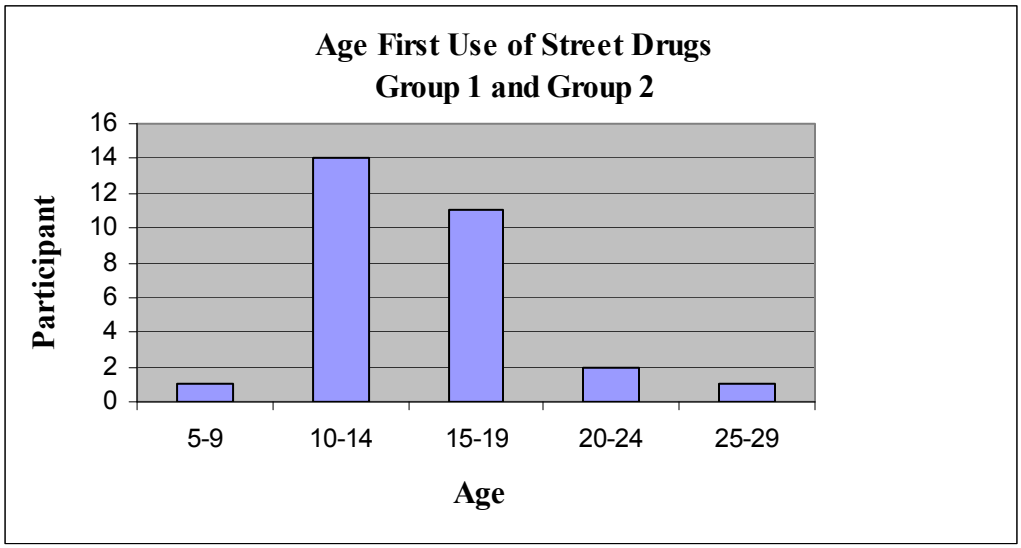

Figure 12. Age when participants from group 1 and group 2 began using street drugs.

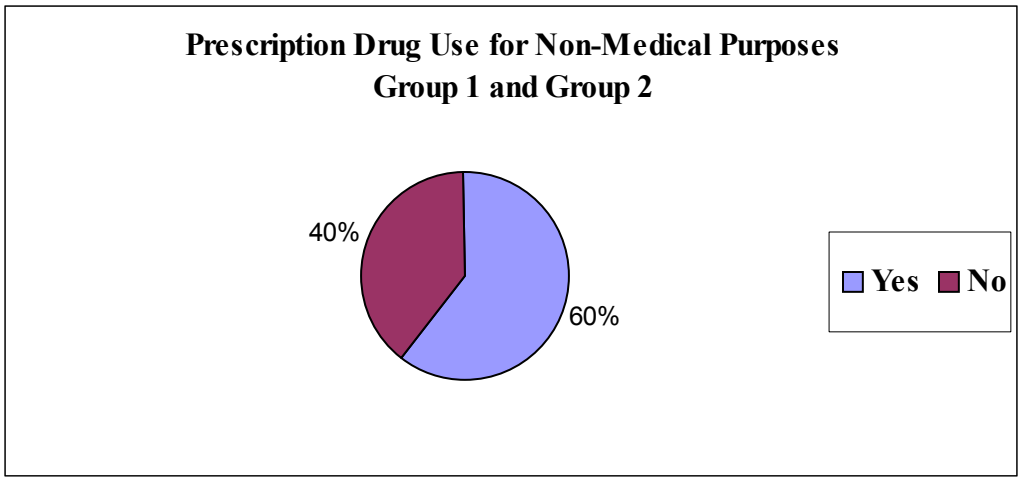

Figure 13. Prescription drug use for non-medical purposes by participants from group 1 and group 2.

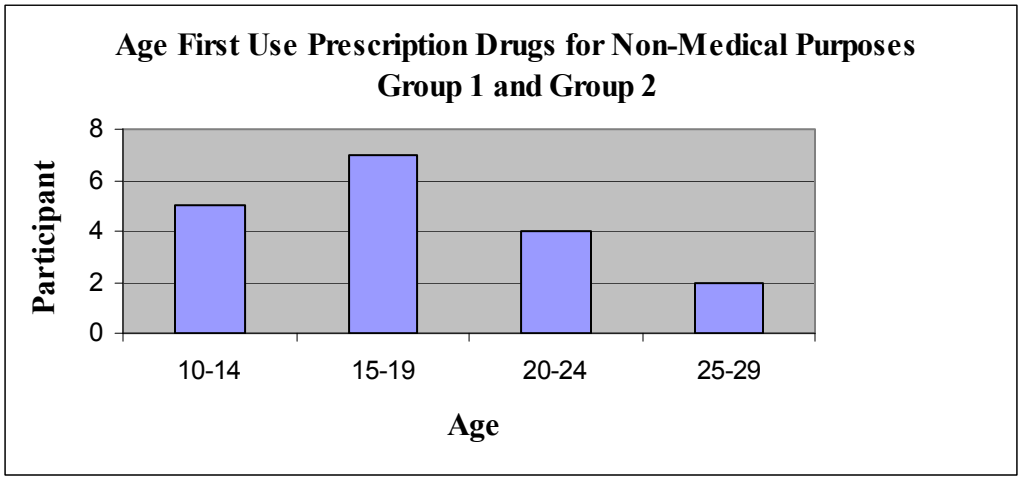

Figure 14. Age when participants from group 1 and group 2 began using prescription drugs for non-medical purposes.

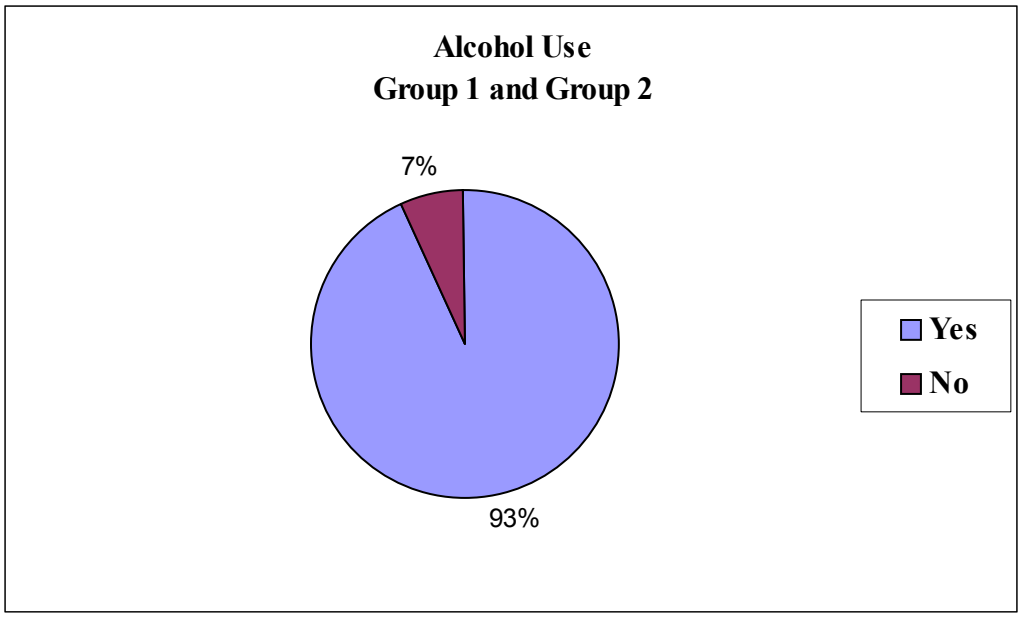

Figure 15. Alcohol use by participants from group 1 and group 2.

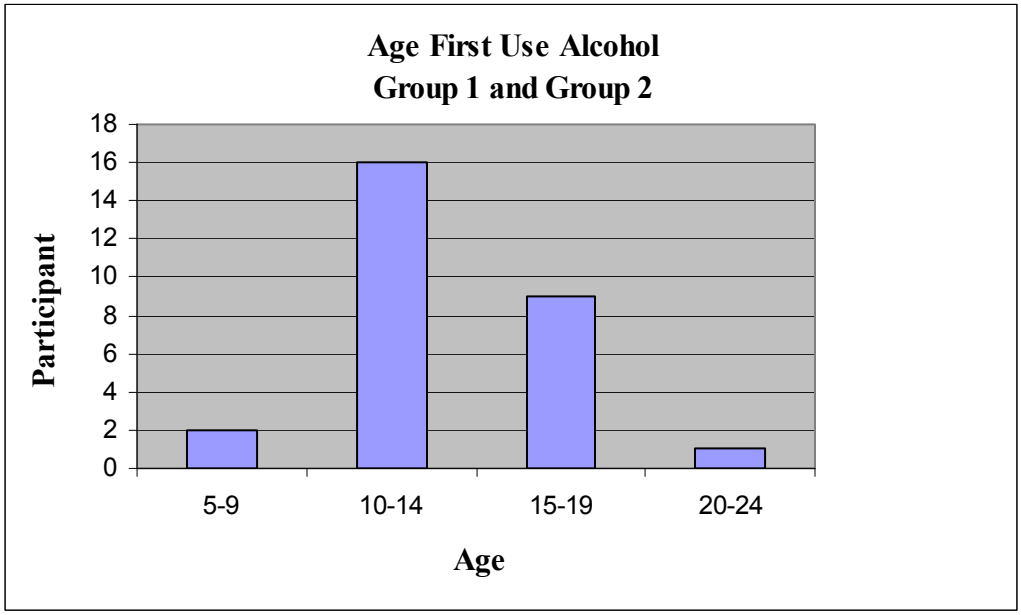

Figure 16. Age when participants from group 1 and group 2 began using alcohol.

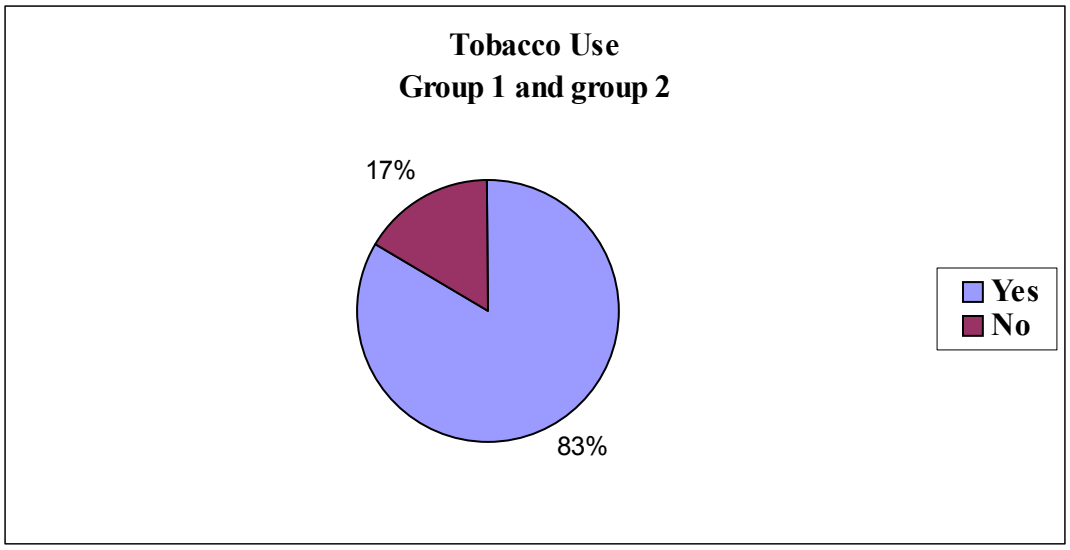

Figure 17. Tobacco use by participants from group 1 and group 2.

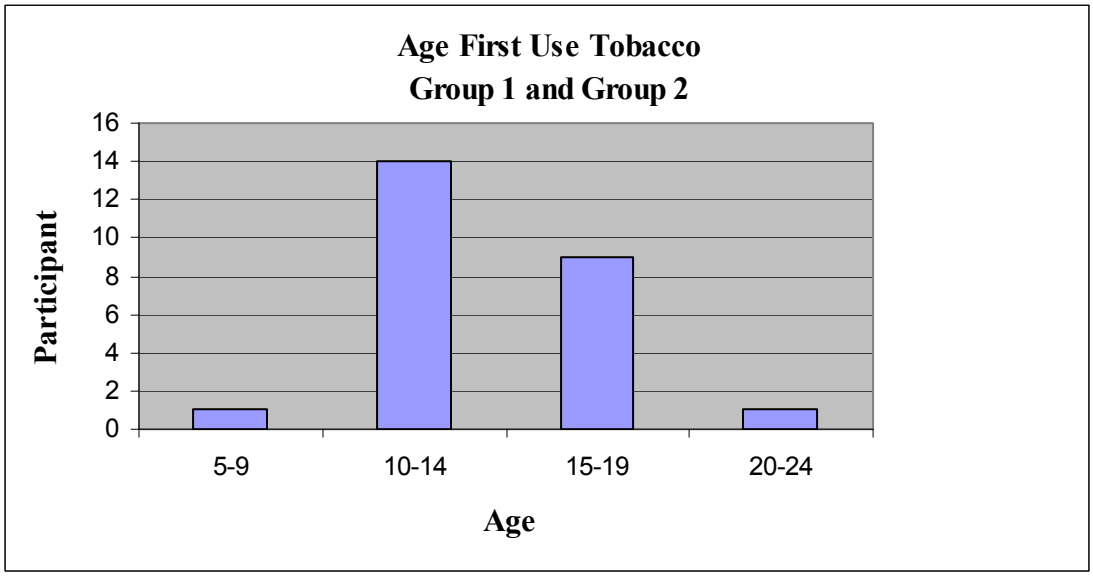

Figure 18. Age when participants from group 1 and group 2 began using tobacco.

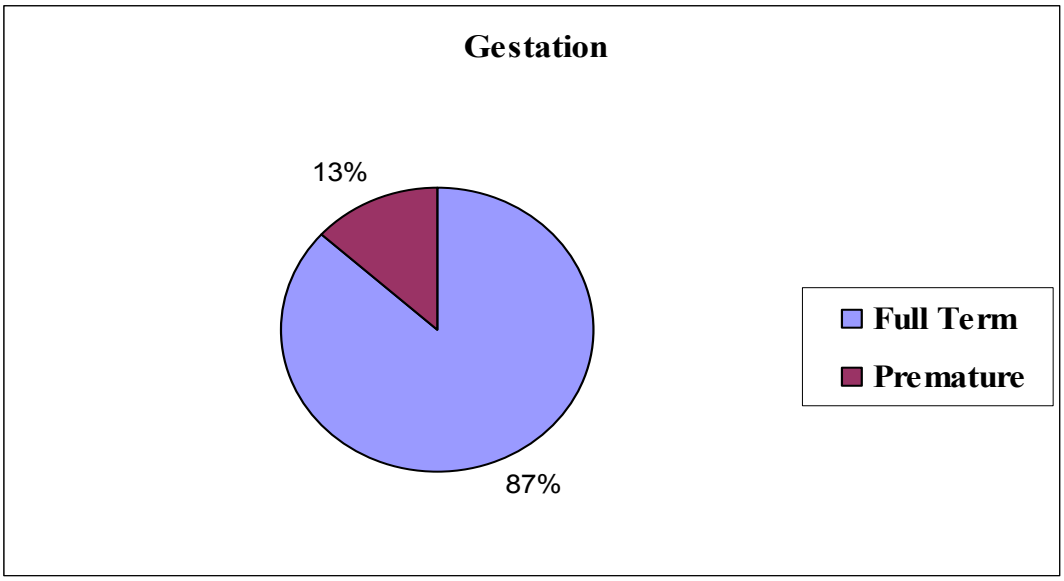

Figure 19. Length of gestation for participants from group 1 and group 2.

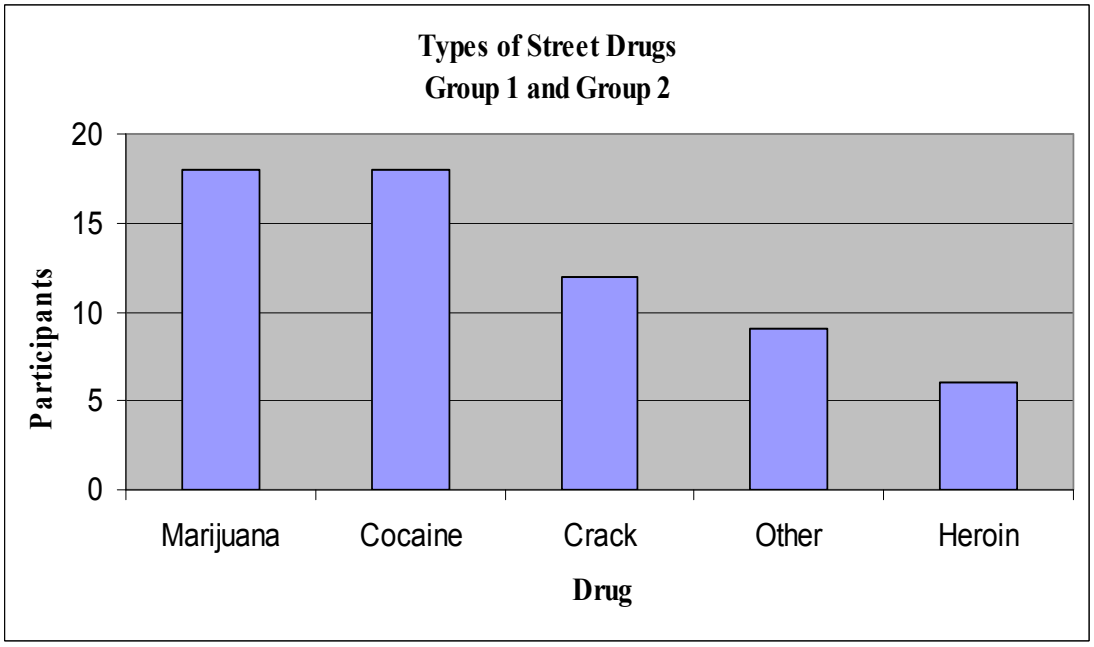

Figure 20. Types of street drugs used by participants from group 1 and group 2.

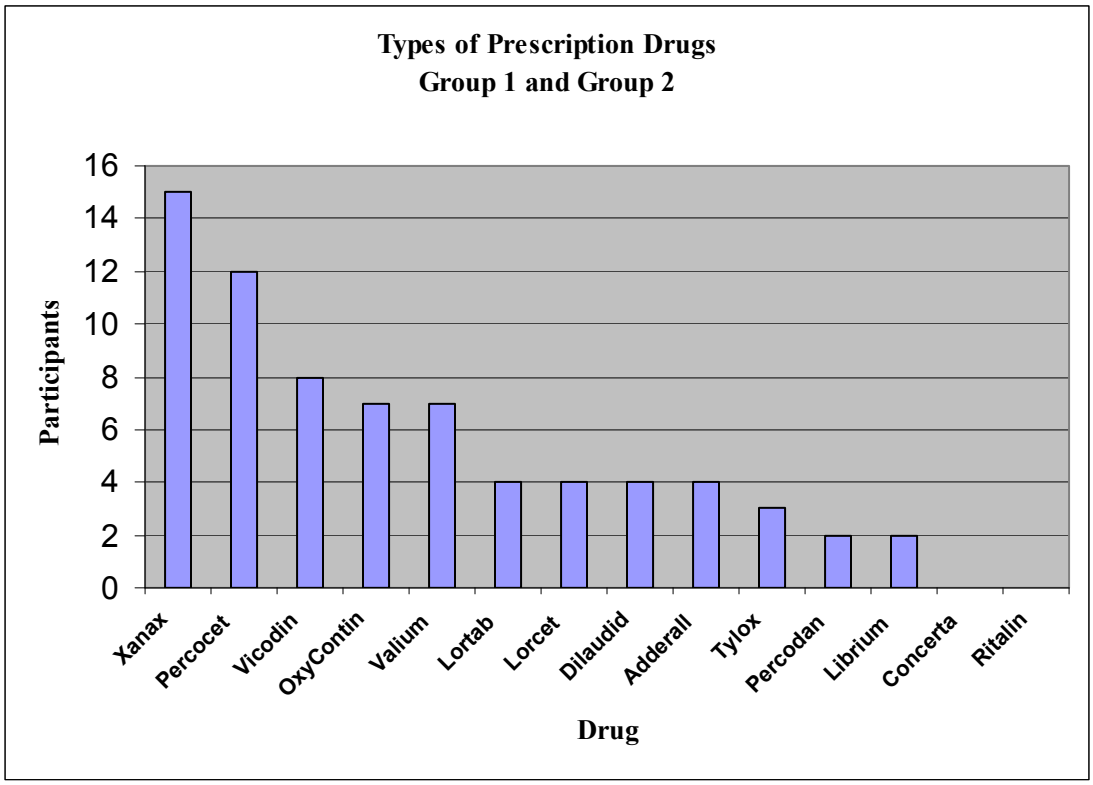

Figure 21. Types of prescription drugs used by participants from group 1 and group 2.

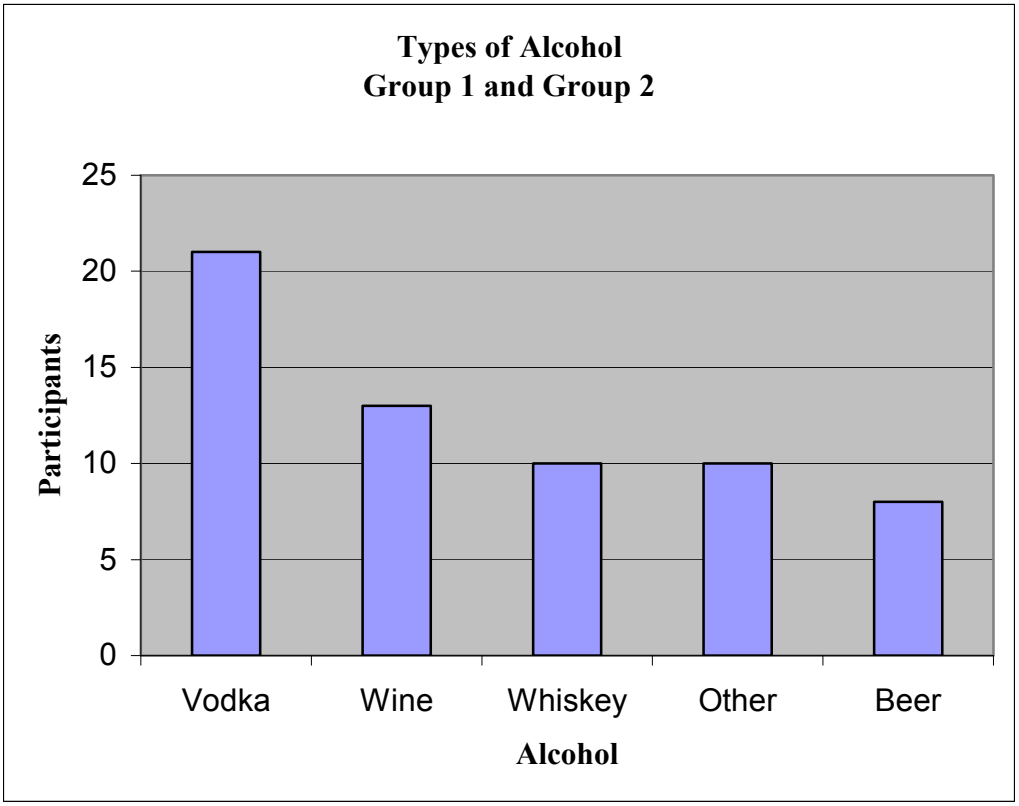

Figure 22. Types of alcohol used by participants from group 1 and group 2.

VITA

VIVIAN BANGO-SANCHEZ

Birthplace	Matanzas, Cuba
1985-1998	Emergency Room Nurse Memorial Regional Hospital, Hollywood, Florida
1988	Bachelor of Nursing Science Florida International University, Miami, Florida
1991	Advanced Registered Nurse Practitioner Florida International University, Miami, Florida
1991	Certified Infant Massage Instructor International Association of Infant Massage Instructors, Tampa, Florida
1994	Master of Nursing Science Florida International University, Miami, Florida
1989-2006	Licensed Massage Therapist Memorial Healthcare System, Hollywood, Florida Retention and Recruitment Program
2000-Present	American Heart Association Training Center Faculty Memorial Healthcare System, Hollywood, Florida
2005-2009	Educator Grant for Dr. Porter's Study Florida International University, Miami, Florida
2006-Present	Lead Licensed Massage Therapist, Memorial Healthcare System, Hollywood, Florida

PUBLICATIONS AND PRESENTATIONS

Bango-Sanchez, V., Kissel, B. and McDade, R. (2010). "Touchy Subjects": Dealing with Sensitive Populations In Research. *Symposium presentation at The Ninth Annual College of Education and Graduate Student Network Research Conference.* Miami, Florida: Florida International University.

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