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Families First: Impact on Parent Knowledge, and Association between Program Quality and Child Symptom Severity

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FAMILIES FIRST: IMPACT ON PARENT KNOWLEDGE, AND ASSOCIATION BETWEEN PROGRAM QUALITY AND CHILD SYMPTOM SEVERITY

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Master of Arts

By
Cibrian Johnson

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FAMILIES FIRST: IMPACT ON PARENT KNOWLEDGE, AND ASSOCIATION BETWEEN PROGRAM QUALITY AND CHILD SYMPTOM SEVERITY

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Associate Provost for Research and Graduate Education

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Cibrian Johnson May 2020 70 Pages

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The Families First parenting workshops were developed for caregivers of children recently diagnosed with autism spectrum disorder (ASD). The primary site hosts in-person workshops, but webcasts the workshops to remote sites in different areas of the United States. The purpose of this study was to assess whether parents have an increase in knowledge after participating in Families First workshops at a remote site, and to assess whether program quality ratings and child symptom severity are associated with parent knowledge. The current study addressed the following research questions:

1. Do parents participating in the Families First workshops at a remote site experience an increase of knowledge from beginning to end of the workshops?
2. Are quality ratings of comfort, satisfaction, and facilitators associated with measures of knowledge and child symptom severity?
3. Is child symptom severity associated with measures of knowledge?

Participants were primarily parents and caregivers of children diagnosed with ASD (*N* = 54) from rural and semi-rural Kentucky. A pre- and post-test design was used to assess content knowledge. Surveys for program quality and child symptom severity were also collected. Results indicated that caregivers consistently increased their content knowledge by the end of workshops. Further, the quality of perceived benefits was negatively associated with child symptom severity, whereas the quality of facilitators was positively associated with quality of satisfaction. In addition, the caregivers' content knowledge was unrelated to child symptom severity. The current study provides some preliminary evidence of Families First benefits, as well as implications for caregivers of children recently diagnosed with ASD seeking preventative services.

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental disorder that impacts an individual's social, communicative, and behavioral functioning (Zand et al., 2018). Children with ASD experience a range of difficulties that affect the interactions between them and their caregivers (Postorino, et al., 2019). For instance, ASD symptom severity is positively associated with parental stress related to child activities of daily living (Shepherd, Landon, & Goedeke, 2018). One way to address these issues is through evidence-based parenting programs and workshops for caregivers (Matson, Mahan, & Matson, 2009). Evidence-based parenting programs for children with ASD aim to teach parents research-supported strategies for decreasing problem behaviors and skill deficits that might be related to developmental delays (Patterson, Smith, & Mirenda, 2012). Effective parenting programs should increase knowledge and skills of participating parents. It is also important that parenting programs be delivered with high quality, which is typically defined as fidelity to treatment protocol. Treatment fidelity tends to indicate successful program implementation, which is characterized by positive parent and child outcomes, as well as program satisfaction (Suhrheinrich et al., 2019).

Autism Spectrum Disorder

The prevalence of children in the United States with an ASD diagnosis is about 1 in 59 (Centers for Disease Control, 2019). Symptoms of ASD vary in presentation across children and the symptoms can be recognized as early as 12 to 24 months of age. Children with ASD experience ongoing deficits in social communication and interaction, as well as display restrictive or repetitive behaviors or interests (American Psychiatric Association, 2013).

Social communication and interaction deficits include difficulties with social-emotional reciprocity, verbal and nonverbal communication, and difficulties with adjusting to various social contexts. An individual might have difficulty drawing others' attention to objects or events with the purpose of sharing the experience. Instead of engaging in joint attention, they might point, reach, or shift their eye gaze (Charman & Baird, 2002; Pecukonis, Skwerer, Eggleston, Meyer, & Tager-Flusberg, 2019). Children with ASD experience difficulty with using and understanding purposeful and relevant non-verbal behaviors, such as making eye contact (Pecukonis, Skwerer, Eggleston, Meyer & Tager-Flusberg, 2019). These communicative difficulties could make it hard for children with ASD to communicate their needs and wants with their parents and caregivers, as well as understand their caregivers' expectations.

Another core set of ASD characteristics includes restricted, repetitive behaviors, interests and activities (American Psychiatric Association, 2013). It is common for individuals with ASD to experience departures from routines as exceptionally stressful, because these children tend to highly prefer the same pattern of daily events. Rigidity to routines could present problems with creating new routines and for handling changes in the environment needed to promote the achievement of developmental milestones (Lord, Elsabbagh, Baird, & Veenstra-Vanderweele, 2018). Children with ASD might also engage in atypical and repetitive behaviors called stereotypies. Stereotypic behaviors are generally benign, but can be problematic if the behaviors prevent the child from learning new skills (Johnson & Myers, 2007). Examples of stereotypies include hand flapping when expressing excitement or frustration, or self-injurious behaviors (Johnson & Myers, 2007). They might also engage in rocking, twirling, or fixated interests toward inanimate objects, e.g., a specific cartoon character or animal.

Children with ASD frequently experience problems with fine and gross motor skills, too. It has been found that development of motor skills has been positively associated with health outcomes and social functioning (Colombo-Dougovito, & Block, 2019). For example, deficits in fine motor skills could add to issues with handwriting or grasping objects (Choi, Leech, Tager-Flusberg, & Nelson, 2018). Another example is that parents of children with developmental disabilities, including ASD, have reported an 82% rate of children experiencing toileting problems compared to their neurotypical counterparts (Francis, Mannion, & Leader, 2017). Fine and gross motor difficulties in children with ASD could affect their ability to follow multi-stepped tasks, such as those involved with toilet training like independently undressing. Additionally, sensory sensitivities could involve adverse responses toward sounds, textures, smells, or temperature (Feldman, et al., 2019). These could lead to challenging behaviors across different settings. This could make outings or errands difficult for parents when bringing their children with ASD along, as the children might have to cope with different or unexpected sensory stimulation. Difficulties in these core areas can present many challenges for parenting, especially without effective strategies to help their children cope with these changes.

Parenting Young Children with ASD

Children undergo many developmental transitions during the first five years of life. Parents typically expect to see changes in cognitive ability, language, fine and gross motor skills, social-emotional skills, and adaptive skills (Edwards & Denham, 2018). It is crucial to child development that parents create opportunities for early learning by allowing child-directed interactions and engaging in positive parenting practices (Britto et al., 2017). This helps facilitate learning to verbally express needs and wants, responding to requests, problem-solving, and interacting with others in meaningful ways, such as sharing. Parents teach their children these skills by modeling and providing practice for the steps involved (Sanders & Mazzucchelli, 2018). This might include self-help skills like dressing and toileting, or social-emotional behaviors like asking for help.

Parenting a child with ASD might present challenges across expected developmental milestones. For instance, social attention and communication behavior challenges that are typically associated with ASD, include decreased response to one's name being called, reduced visual attention to socially meaningful cues, and low levels of joint attention and communicative gestures (Zwaigenbaum et. al, 2015). Deviations from typical language and communication, such as understanding simple gestures, can be observed as early as 9 months of age in children with ASD (Davidovitch, Stein, Koren, & Friedman 2018). Limited language skills are associated with increased ASD symptoms (Özyurt & Dinsever Eliküçük, 2018), which could contribute to reduced reciprocal communication behaviors and expression of emotions. Due to this, parents might believe that they do not have the tools for teaching their children how to communicate in order to connect with peers or take direction from other adults.

Contributing to the difficulties with communication and social interaction are motor skill deficits; these deficits can impede functional activities, which leads to disrupted social interaction and communication (Andy & Masters, 2019). Physical developmental milestones, such as dressing one's self or beginning toilet training are multi-stepped tasks that involve fine and gross motor skills, as well as effective strategies to communicate the steps. Further, skills needed for sitting are difficult for caregivers to teach due to the interaction between communication and motor skill deficits (Bhat, Landa, & Galloway, 2011). Attempts to increase motor skills for functional activities in children with ASD could result in caregivers dedicating more time, effort, and support than expected.

Parents are expected to contribute to the social-emotional development of their children. Social-emotional difficulties for children with ASD are characterized by reduced positive affect, low levels of emotional regulation, and increased levels of negative affect and distress (Raza et al., 2019). Fenning et al. (2018), found that ASD symptom severity was the strongest predictor of emotional regulation (i.e., controlling emotions to achieve a goal) when compared to IQ level and age. However, younger age and lower quality of scaffolding support during challenging activities by the parent were all associated with higher levels of emotional dysregulation. Specifically, findings emphasize the importance of scaffolding tasks aimed to reduce behavioral problems associated with emotion regulation difficulties, such as ineffective coping skills use (Fenning et al., 2018). This means that parents play a critical role in the social-emotional regulatory process for their children to learn how to interact adaptively with others, and parents are heavily relied upon to provide consistent support.

The difficulties with social-emotional development and co-occurring problems could become a source of stress for caregivers (Raza et al., 2019). Parenting stress can be defined as difficulties with completing tasks associated with caregiving, such as advocating on behalf of the child, attending their medical/therapy appointments, cleaning up after them, helping with toileting, dressing, and bath time (Shepherd et al., 2018). Parents of children with ASD have been found to experience higher levels of stress and depressive symptoms compared to parents of children without ASD. Child delays and social skills deficits were shown to be the most consistent predictors of parenting stress for both mothers and fathers, specifically impacting the parent-child relationship as well as parents' perception of the child as difficult (Davis & Carter, 2008). However, increased deficits in cognitive and communication abilities, adaptive behavior, externalizing and internalizing problem behavior, and restricted and repetitive behaviors also contribute to parental stress (Zaidman-Zait et al., 2017). ASD symptom severity and behavior problems appear to be associated with parenting stress. Results from Reed, Howse, Ho, & Osbourne (2017) suggested that higher parent reported parenting stress was negatively associated with parents' perceptions their limit-setting abilities.

Managing demanding behaviors and discipline in public places were found to be high sources of overall parenting stress (Phetrasuwan & Miles, 2006). Parental stress related to child interaction and communication skills could also impact parental behaviors toward children. It is indicated that increased parenting stress directly and indirectly reduces parents' ability to stimulate child development and use effective discipline strategies (Ku, Stinson, & MacDonald, 2019). Lack of social support, including familial and informal support, are associated with higher levels of psychological distress for mothers of children with ASD. Social support has been linked to positive effects such as feeling understood, having support with daily schedules and help with managing difficult behaviors (Shepherd, Csako, Landon, Goedeke, & Ty, 2018). In sum, these findings suggest that early interventions for parents to gain social support and learn effective strategies for teaching communication, social-emotional, and adaptive skills would improve outcomes for children with ASD and decrease parenting stress.

Evidence-Based Early Intervention

General parenting program. Evidence-based parenting programs often aim to reduce child behavior problems. These programs might also help parents develop more effective parenting skills to manage their children's behavior, and improve the overall emotional and behavioral adjustment of children. Evidence-based parenting programs are associated with increased positive parenting practices, decreased ineffective use of discipline, and improved parental mental health (Gray, Totsika, & Lindsay, 2018). One way that parenting programs could support parental mental health is to provide a source of social support. Parenting programs often focus on the social context of parenthood, and on techniques to enhance a family's social network, social support, and community linkages as buffers against stress and isolation (Ponzetti, 2015).

Teaching caregivers specific skills has been correlated with more positive outcomes than providing them with general information (Kaminski, Valle, Filene, & Boyle, 2008). When parent-training programs change parenting behavior to address child needs, child behavior problems could be prevented. Specifically, increasing the frequency of positive parent-child interactions, emphasizing importance of parenting consistency, and requiring parents to practice new skills with their children were found to be useful elements (Kaminski et al., 2008). While quality parenting programs should meet specific recipient needs, they should also incorporate assessment procedures before, during, and after the intervention to ensure that the program is making the anticipated changes and that the program is being delivered as expected (Sanders, & Kirby, 2015).

Evidence-based interventions for parents have common elements related to instruction, skill practices with feedback, and interactions with facilitating staff and potentially other caregivers. For example, Incredible Years (IY) is an evidence-based parent-training program that teaches parents emotional communication skills, positive parent-child interaction skills, discipline consistency, and time-out. IY relies heavily on modeling and practicing parenting skills through role-playing, in which caregivers are required to practice at home (Marcynyszyn, Maher, & Corwin, 2011). When IY is delivered in groups, parents break into small groups and exchange their ideas and experiences during brainstorming sessions. Group leaders help parents come up with alternative strategies for approaching scenarios presented in video vignettes (Weeland et al., 2017). However, these sessions might require a greater time and resource commitment from parents who could benefit from a low-intensity program. Low-intensity programs are interventions that are time-limited and provide general skills over a specific topic area to either solve or prevent difficulties with functioning.

In the area of parenting low-intensity programs, the Triple P-Positive Parenting Training Program (Triple P) is an example of a program that has multiple levels that are low intensity and related to preventing and treating social, emotional, and behavioral problems in children (Sanders, Kirby, & Tellegen, 2014). Low-intensity levels of Triple P are targeted for parents with specific concerns for their child's behavior and development. The Selective Triple P (i.e., prevention level two) emphasizes high quality, brief parenting advice for specific concerns through 90-minute seminars. The seminars can be administered face-to-face, via telephone, or through group sessions (Sanders et al., 2003). The Group Triple-P program has shown medium effects regarding improvement in child and parenting outcomes on parent rating scales of child and parent behaviors. Parent knowledge of intervention content has not assessed (Thomas et al., 2007). This might be a missed opportunity because measures of parent knowledge could be a low-intensity assessment of prevention program gains.

ASD parenting programs. Similarly, evidence-based programs for parents of children with ASD provide parents with early intervention skills that target behaviors specifically related to ASD. According to Shepherd et al. (2018), research has shown that parents commonly choose interventions that target specific ASD-related deficits, such as communication or toileting skills, especially when those deficits are the more severe. The severity of deficits is typically due to the child being older and already missing specific developmental milestones. Further, interventions that target child-specific needs (e.g., remediating behavioral deficits) have been shown to decrease parenting stress at follow-up of treatment (Golfenshtein, Srulovici, & Deatrick, 2016).

Parenting programs that are designed around applied behavior analysis (ABA) principles are designed to consistently provide instructions, skill practices with feedback, and parent-child interactions (Grigorenko, Torres, Lebedeva, & Bondar, 2018). That is, they are consistent with parts of other evidence-based parenting programs. ASD-focused ABA parent training programs and workshops that are group-based can reach several parents simultaneously and help parents gain skills. Indeed, group-based programs have been found to be just as effective in delivering positive outcomes as one-on-one sessions (Schultz, Schmidt, & Stichter, 2011). Further, these programs have been shown to improve parenting competency, discipline practices, and child social and communication skills (Brookman-Frazee, Stahmer, Baker-Ericzén, & Tsai, 2006).

There are multiple examples of behaviorally based and ASD-focused parenting programs. An example would be Family Implemented TEACHH (Training and Education of Autistic and other Communication Handicapped Children) for Toddlers (FITT). FITT aims to teach parents about ASD and how symptoms could present in their toddler; provide tips for enhanced daily engagement; and instruct how to implement TEACHH behavioral strategies to improve communication, play, joint engagement and understanding (Turner-Brown, Hume, Boyd, & Kainz, 2019). FITT implementation was found to decrease parental stress and increase physical well-being (Hume & Turner-Brown, 2018). This program includes weekly in-home visits that cover topics like daily structure, communication, play, transitions, advocacy, and community functioning. TEACHH instructors initially lead sessions and parents gradually take over in final sessions (Hume & Turner-Brown, 2018).

Another program is Collaborative Model for Competence and Success (COMPASS) for Hope (C-HOPE), which tailors interventions to parents of children with ASD and has activities to facilitate parent-to-parent interaction, and parent knowledge and skills (Kuravackel, Ruble, Reese, Ables, Rodgers, & Toland, 2018). C-HOPE sessions focus on educating parents about common ASD symptoms and behaviors that can interfere with learning and communication. Sessions also involve teaching parents how to manipulate the environment to encourage positive behaviors in children. Parents are encouraged to create behavior plans based on their child’s behavioral functioning, learn replacement behaviors that will give their children the same results, and learn how to deliver rewards for adaptive behaviors. C-HOPE can be delivered through face-to-face and telehealth platforms to individuals or groups. Parent outcomes from C-HOPE showed pretest to posttest decreases in parental stress and increases in parent self-reported competency. Moreover, the telehealth modality was associated with decreased child problem behaviors, and high levels of parental satisfaction with services and facilitators through group delivery (Kuravackel et al., 2018).

Programs like FITT and C-HOPE may be effective, but they can be time and resource intensive. This might be helpful for parents to improve existing severe problems, but not necessary for low-intensity needs or to prevent future difficulties. If a parent requires basic strategies to aid in child development and socialization, then an intensive training program might be too intrusive or costly for the help needed. One alternative is to use low-intensity programs, which provide aid to reduce the onset and severity of problems, and are targeted for current developmental needs (Sanders, Markie-Dadds, & Turner, 2003)

In regard to low-intensity caregiver training programs for children with ASD, there is a gap in the literature for assessing parent knowledge of parenting practices before and after receiving the program. Assessing knowledge of program content is important because increased knowledge of parenting practices corresponds to decreased child problem behaviors, increased parental competency, and decreased parenting stress (Kuravackel et al., 2018). Furthermore, parenting competency is often measured through parent self-report in low-intensity programming, rather than objective measures related to information directly addressed in the programs. It is also established that parent-reported quality ratings of parenting programs correspond to improvements in parent and child outcomes (Gross et al., 2015). However, this correspondence has not been looked at for ASD focused parenting programs. While there are consistent positive associations between child symptom severity and parent stress, there are limited data regarding how child symptom severity corresponds to program parenting outcomes for level of knowledge or perceived program quality.

Families First

Families First is a free low-intensity program for caregivers of children newly diagnosed with ASD that is delivered by Vanderbilt University's Treatment and Research Institute for Autism Spectrum Disorders (TRIAD). The program is designed as a series of workshops, which are developed for parents of children ages 2-7 years with the goal of providing caregivers with resources and strategies to help make teaching daily activities, routines, and child independence simpler and easier. Families First is structured similarly as other evidence-based parenting programs for parents of children with ASD. It is based on ABA principles, and parents have the opportunity to interact with other parents to share experiences and strategies using program content. The workshops include handouts, video vignettes, and facilitated group discussion. Examples of the parenting workshop themes include: beginning toilet training, communication, and addressing challenging behavior. While the workshops are stand alone, they have overlapping core strategies and resources that can be used for other areas of need, e.g., laminated picture exchange communication system (PECS) pictures. The workshops are hosted in-person at the home site and they are webcasted to remote sites. The remote sites receive all the materials that are available at the home site; however, they are facilitated by remote site staff.

Purpose of Study

The purpose of this study is to assess whether parents have an increase in knowledge after participating in Families First workshops at a remote site, and to assess if program quality ratings and child symptom severity are associated with parent knowledge. The current study will assess the following research questions:

1. Do parents participating in the Families First workshop at the remote site experience an increase of knowledge from beginning to end of the workshops?
2. Are quality ratings of comfort, satisfaction, and facilitators associated with measures of knowledge and child symptom severity?
3. Is child symptom severity associated with measures of knowledge?

In regard to the first research question, the null hypothesis is that parents will show no changes in knowledge from beginning to end of workshops. The alternative hypothesis is that parents will have an increase in knowledge from beginning to end of workshops. In regard to the second research question, the null hypothesis is that quality ratings will be unassociated with measures of knowledge and child symptom severity. The alternative hypothesis is that quality ratings will be associated with measures of knowledge and child symptom severity. In regard to the third research question, the null hypothesis is that child symptom severity will be unassociated with measures of knowledge. The alternative hypothesis is that child symptom severity will be associated with measures of knowledge.

Methods

Setting and Participants

Workshops were held in a building on campus at a Southern university that is a Families First remote site and free childcare was provided. Data collection began in August 2018 and ended in February 2020, and covered seven total workshops. The workshops had on average 7.71 study participants (*SD* = 5.50; *range* = 2 to 18). Participants included parents and caregivers of (*N* = 54) from rural and semi-rural Kentucky who attended the workshops. The caregivers self-selected if they wanted to participate in the study. The mean caregiver age was 37.67 years (*SD* = 12.14). The majority of caregivers were women (64% female, 14% male, 22% unreported, and identified as White/Caucasian (65.6% White/Caucasian, 4.7% Black/African American, 4.7% Asian/Pacific Islander, 1.6% Other, and 23.4% unreported).

Based on caregiver report of child demographics, the mean child age was 4.56 years (*SD* = 2.60). The majority of children (*N* = 43) were male (74% male, 11% female, 15% unreported), identified as White/Caucasian (86% White/Caucasian, 5% Other, 2% Black/African American, and 7% unreported), and had an ASD diagnosis (77% ASD diagnosis, 23% No ASD diagnosis) per parental report. Some attendees were seeking parenting help related to specific topic areas, but their children that did not have a known ASD diagnosis. Approximately 23% of the children had a co-occurring psychological or behavioral disorder per parental report. Parents also reported that several of the children received special services at home (37%) and school (58%).

Measures

Participants received assessment packets at pre- and post-test for each workshop. The pretest packet included a demographic survey, items related to parent-perception of child problems, and an assessment of workshop content knowledge (see Appendix A as an example). The posttest packet included an assessment of workshop content knowledge and surveys of program quality (see Appendix B as an example).

Content knowledge. The assessments of knowledge were quizzes with 10 multiple-choice items that were developed from workshop content. The quiz items are directly linked to presentation components or materials for respective workshop activities. Two of the workshop facilitators were university faculty, who were knowledgeable of content, and collaborated to create the quiz questions. One workshop facilitator wrote the questions, while the other workshop facilitator reviewed the quiz questions and provided feedback. Both facilitators have expertise in ASD and parenting. The quizzes were administered before and after the workshop to assess knowledge of workshop content. The possible scores ranged from 0 to 10 correct with higher scores indicating more knowledge of content.

Parent perceptions of child symptom severity. There were three items related to parent's perception of child symptom severity. These items asked parents to rate their child's problem severity, manageability, and tolerability on a 6-point scale. The scale ranged from 1 to 6, with 1 being the least severe to 6 being most problematic. The problem area was changed to reflect the focus of each workshop. Scores from each item were summed and could range from 3 to 18, and higher score totals indicated greater symptom severity.

Quality assessment. The post-workshop service questionnaire contained 33 Likert-type items. All items could be rated on a 6-point scale (*strongly disagree* = 1, *disagree* = 2, *slightly disagree* = 3, *slightly agree* = 4, *agree* = 5, or *strongly agree* = 6), which meant rescaling some measures. Caregivers completed the quality survey, which has measures for comfort, satisfaction, and facilitation quality. All measures and related subscales will be used as summed scales.

Six items were adapted from the Service User Technology Acceptance Questionnaire (SUTAQ) *Perceived benefit* scale. The Perceived benefit scale measured beliefs about how the workshop might improve the care children received from their health care professionals, as well as beliefs indicating how the workshop aligns with the care received from health care professionals (Hirani et al., 2017). Wording of the items were changed from the original version that was based on in-home telehealth services to make them consistent with the workshop format.

Six items were adapted from the Telehealth Satisfaction Questionnaire to assess caregiver satisfaction with the workshop (TSQ; Morgan et al., 2011). The original version of the TSQ had patients rate service satisfaction items on a 5-point scale (*very dissatisfied* = 1 to *very satisfied* = 5) and its service convenience items on a 5-point scale (*very inconvenient* = 1 to *very convenient* = 5). Wording for the items were changed to make them consistent with workshop delivery.

The Facilitator Rating Profile (FRP) has eight items, and is an adaptation of the Consultant Rating Profile (CRP; Noell et al., 2005). The items adapted from the CRP were used to measure caregivers' perceptions of the facilitators. The original version consists of 10 items rated on a 7-point scale (*strongly disagree* = 1 to *strongly agree* = 7). The first seven items asked about the extent to which the facilitators were effective, and the last three items asked about the extent to which the workshop was effective. Five of the first seven items were used and all three of the last three items were used. Wording for the items were changed to make them consistent with workshop delivery.

Demographic survey. The demographic survey has 13 items. Caregivers were asked to identify their own gender, race/ethnicity, age, and primary language. Afterwards, caregivers were asked to identify their child’s gender, race/ethnicity, age, ASD diagnostic status, diagnostic status for other psychological or behavioral disorders, whether they receive special services at school and home, and if they have ever attended a Families First workshop before.

Procedures

For the current study, caregivers were recruited to attend the workshops through ASD support groups, health professionals, and contact with university faculty. Workshops were held in a building on campus at a Southern university that is a Families First remote site and free childcare was provided. When families arrived, caregivers were asked if they wanted to participate in the research study. Caregivers that chose not to participate still could participate in the workshop. Caregivers that chose to participate were given the informed consent document. After they reviewed and signed the informed consent, they were given the pretest packet to complete. Each caregiver was assigned a random numeric identifier to maintain their confidentiality throughout the data collection process.

The workshops were livestreamed from the primary university through web-based broadcasting service, and displayed on a projector screen at the front of a meeting room on the remote site campus. The workshops lasted three hours on average and parents were given a 10-minute break in the middle of each workshop. Content varied between each workshop. For example, the Developing Communication Skills workshop focused on identifying ways to help children communicate more effectively. The workshop based on Increasing Independence focused on teaching children strategies for completing self-help skills. There was a workshop in preparing for community routines, which promoted successful engagement in community outings. The beginning toilet training workshop focused on increasing motivation and identifying supports for the child during the toilet training process. The addressing challenging behavior workshop taught caregivers how to use reinforcement to teach more appropriate behaviors and strategies for responding to challenging behaviors.

At the end of the workshops, parents who consented to be in the study were asked to complete the posttest packet. Workshop facilitators and research assistants were available to clarify any questions caregivers had, while completing the quality assessment surveys. Lastly, research assistants collected the packets from participants individually. All procedures were approved through the university institutional review board.

Analysis Plan

Means and standard deviations were calculated for outcome measures of content knowledge, parent's perceptions of quality, and child problem severity. Cronbach's alpha was computed to assess the internal consistency for the outcome measures, with α =.60 representing acceptable reliability (Peterson, 1994). Pearson's *r* Correlations were conducted to assess associations between outcome measures, where the alpha-level was set to .05 for statistical significance.

Primary Analyses

Hypothesis One. In regard to the first research question, two-tailed repeated measures analysis of variance (ANOVA) was conducted to examine whether there were significant increases in content knowledge from the beginning to the end of the workshops. The *p*-value was set at .05. The effect size used was Cohen's *d* with *d* = 0.2

meaning a small effect size, $d = 0.5$ as medium, and $d = 0.8$ as large (Rice & Harris, 2005).

Hypothesis Two. Two-tailed Pearson's r correlations were calculated for the second research question to examine the associations between the SUTAQ, TSQ, and FRP scales (quality), quizzes (content knowledge), and the child symptom severity scale. The p-value was set at .05, and r^2 was used as the effect size.

Hypothesis Three. Two-tailed Pearson's r correlations were conducted to explore the third research question by examining the associations between measures of child symptom severity level and content knowledge from pre to post-workshop. The p-value was set at .05, and r^2 was used as the effect size.

Missing Data

Missing data was handled through listwise deletion. Participants with missing data for the pretest or post-test quiz ($n = 8$) were compared to those with all data for the quizzes ($n = 46$) on key demographic characteristics and study outcomes. Overall, there were 15 comparisons made, therefore a Bonferroni correction was made and the alpha level was set at .003 (.05/15 = .003). Chi-square was used for comparing categorical data and an Independent-Samples Mann-Whitney U Test was used for continuous outcomes. All results were statistically non-significant, which indicated equivalence between the samples. Therefore, listwise deletion was used. See Appendix C for specific results.

Results

Table 1 contains the descriptive statistics for all study measures, as well as their intercorrelations. The table also contains Cronbach's alpha for the quality measures and symptom severity scale.

Hypothesis One. A repeated measures ANOVA was conducted to examine whether there were significant increases in content knowledge from beginning to end of the workshops. The results indicated a statistically significant difference in content knowledge from beginning to end of the workshops with a large effect size, $F(1, 45) = 25.47$ $p < .001$, $d = 0.81$. Content knowledge scores consistently increased from beginning to end of the workshop ($M_{\text{difference}} = 1.44$, 95% CI [0.86, 2.01]). See Figure 1 for the means comparison from pretest ($M = 6.74$, $SD = 2.44$, 95% CI [6.01, 7.47]) to post-test ($M = 8.17$, $SD = 1.47$, 95% CI [7.74, 8.61]).

Hypothesis Two. Pearson's *r* correlations were calculated to examine the associations between the SUTAQ, TSQ, and FRP scales (quality), quizzes (content knowledge), and the child symptom severity scale. A Pearson's *r* analysis revealed a moderate negative correlation between symptom severity and SUTAQ ($r = -.33$, $p = .042$), and accounted for 11% of the variance. Results indicated that as child symptom severity scores increased, parent-reported quality ratings of perceived benefits decreased. Also, a large positive correlation was found between FRP and TSQ scales ($r = .62$, $p < .001$), and accounted for 38% of the variance. Results indicated that as ratings of facilitator satisfaction increased, caregivers' ratings of workshop satisfaction increased. All other correlations were non-significant.

Hypothesis Three. Pearson's *r* correlations were calculated to examine the associations between child symptom severity level and content knowledge from the beginning and end of the workshops. The results indicated non-significant associations between child symptom severity level and content knowledge from the beginning and end of the workshops.

Discussion

The purpose of this study was to assess whether caregivers have an increase in knowledge after participating in Families First workshops, and to assess the associations between parent knowledge of workshop content, program quality ratings, and child symptom severity. Concerning the first research question, caregivers consistently increased their knowledge by one or two items from the beginning to the end of the workshops. Results related to the second research question indicated a moderate negative correlation between child symptom severity and quality ratings of perceived benefits. That is, as caregivers' perceived child symptom severity increased, they perceived that the workshop would result in fewer benefits for their child's behavior. Results also indicated a large positive correlation between quality ratings of facilitators and telehealth satisfaction. That is, as caregivers' ratings of facilitator satisfaction increased, their satisfaction with the workshop overall increased. Outcomes for the third research question indicated that symptom severity and content knowledge were unrelated in this study.

Parent Knowledge

Data from this study suggest that participating caregivers learned new information from the Families First workshops. These workshops may be useful for teaching caregivers strategies for caring for children with ASD. However, there was only a 14%

increase in average quiz scores, which could mean that parents typically had a slight gain in knowledge related to the quiz content. This is in contrast with other studies, for example one by Heitzman-Powell and colleagues (2014), which found an increase of 39% on average for knowledge of ASD and ABA strategies. However, this was an individual family-focused, multiple module parent training, rather than a short-duration workshop. The current finding also relates to findings from Thomas et al.'s study (2007) in which Group Triple-P, similar to Families First, found medium effects for parent outcomes. However, their study did not assess parent knowledge of content and Families First found a large effect size for increased content knowledge. Some Families First attendees might have attended previous Families First workshops. Due to this, they might have entered workshops with greater prior knowledge as compared to other types of parenting programs.

Nevertheless, it is possible that a large proportion of caregivers already knew several strategies for caring for their children with ASD. For instance, the average pre-test score was 6.74 out of 10 points, with 45% of caregivers scoring 80% or greater. This could be an artifact of the convenience sample used for the current study. If most of the participating caregivers attending the workshops were from word of mouth advertising, then there is the potential that they are more likely to seek out other similar opportunities, as well. Another contributing factor could be that the content knowledge quizzes contained only 10-items, which could make the items more broad. This is in contrast to the 48-item knowledge assessment used by Heitzman-Powell et al. (2014) that allowed for several narrowly focused questions to be asked. However, it might provide better quality outcomes information than caregiver-report rating scales.

Quality Measure Associations

When considering the quality measures relation to study outcomes, a negative association was observed between perceived benefits and symptom severity. This might be related to caregivers perceiving that the benefits from the workshop were less apparent than other intensive and ongoing services they receive. This finding could be related to the prior research stating that services targeting the child's specific and most severe deficits are what lead to more parental engagement (Shepherd et al., 2018). For instance, if the child's deficits mostly involve communication, the parents are most likely to seek out services specific to communication, such as speech therapy. That finding suggests that participating caregivers might have perceived fewer benefits due to their desire for a more comprehensive and time intensive service to directly target deficits that are most severe for their child. Further, caregivers might also want services related to intensive intervention over low-intensity programs if there is elevated symptom severity.

Another finding was a large positive correlation between quality ratings of facilitators and satisfaction with the workshop. This finding might be attributed to the idea that helpful and engaging facilitators make it more likely that caregivers will be satisfied with the various parts of the workshop. Reviews have indicated that one of the key factors contributing to parents' perceived benefits and meaningfulness of a parenting program was their perception of facilitators. Parents specifically valued facilitators' encouragement, modeling of techniques, management of group dynamics, and flexibility that allowed parents to influence content while focusing on the program's content aims (e.g., Butler, Gregg, Calam, & Wittkowski, 2020). Our finding is aligned with prior research suggesting that creating a positive atmosphere, where caregivers are comfortable to ask questions and learn from the workshop, as well as their peers, could be critical for overall satisfaction of workshops.

Symptom Severity and Parent Knowledge

The non-significant correlations between symptom severity and parent knowledge suggest that the child's symptom severity and caregivers' knowledge of how to assist their child are unrelated. It is possible that the symptoms for the children in this study have not been present long enough to have highly detrimental effects. The mean age of the children (*M* = 4.56, *SD* = 2.60) could indicate that the caregivers still expect their children to have limited skills. That is, they could see their children as still developing communication, behavioral, and adaptive skills, rather than failing to meet developmental milestones. The non-significant correlation could also be attributed to the idea that once their child was given the diagnosis, caregivers were motivated to seek resources and knowledge regarding the diagnosis prior to going to the workshop. Following diagnosis, parents typically focus on the interventions that their child will need to address developmental concerns (Shepherd et al., 2018). Further, 58% of children received special services at school and 37% received services at home in the current study. Also, caregiver ratings of symptom severity were moderate. These caregivers could have learned about some of the ideas and practices from services prior to the workshop, which could have also contributed to lower symptom severity in general. Overall, caregivers might receive services independent of child symptom severity, which could serve to lower problems overall.

Limitations

While the current study was informative about the outcomes of Families First, it has limitations. One limitation is that the sample was non-random and consisted of a small number of caregivers. In addition to the small sample size, data was aggregated across different types of workshops. A larger sample size will be needed across each type of workshop in the future to determine how much information caregivers are gaining, and to understand better the relationships between caregivers' knowledge, their children's symptom severity, and the quality for specific workshops. Workshops were facilitated by individuals with expertise in ASD and parenting. Future research would be needed to investigate whether the workshop could be delivered by non-expert professionals, given that they receive the proper training. If facilitator and program quality is not affected by having non-expert professionals, then there is a possibility that additional costs could be minimized as a result.

Another limitation was the lack of follow-up data from the workshop. Follow-up data would be needed to assess whether caregivers retain the information they learn from the workshop, and if the ratings of symptom severity changed. If symptom severity changes following the workshop, then it would be interesting to know if the change is significantly correlated with the retention of knowledge from the workshop. Lastly, there was a lack of psychometric data for the measures used. Further psychometrics of the measures with larger samples will be needed to provide evidence of the reliability and validity of them. Further investigations of the content knowledge quizzes could show how items could be modified the better reflect workshop specific content.

Conclusions

The purpose of the current study was to evaluate the immediate effects of Families First workshops across caregiver knowledge and program quality, as well as the associations between them and child symptom severity. Findings suggested that participating caregivers did have slight increases in their knowledge by the end of the workshops. However, association of program quality and other outcomes were non-significant or mixed. Programs, such as Families First, might consider how to adjust some program elements to relate to varying levels of symptom severity. However, high quality interactions with facilitators seem to be an important aspect of the workshops and should continue. In sum, the current study provided some evidence that Families First workshops are helpful for caregivers to gain knowledge of strategies for preventing problem behaviors and promoting independence in young children with ASD.

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Table 1

Pearson's r Correlations and Descriptive Statistics for Parent Knowledge, Quality Ratings, and Child Symptom Severity.

	1	2	3	4	5	6
1. Pre-test	--	.62**	-.26	-.09	.00	.06
2. Post-test		--	-.22	-.16	-.06	.15
3. SUTAQ			--	.26	.19	-.33*
4. TSQ				--	.62**	-.05
5. FRP					--	.14
6. Symptom Severity						--
N	47	49	48	49	37	40
M	6.70	8.14	29.77	33.55	46.32	8.73
SD	2.43	1.44	6.15	2.74	3.17	3.48
α	--	--	.69	.64	.97	.88

Notes. Pre-test is workshop quiz pretest scores. Post-test is workshop quiz post-test scores. SUTAQ = Service User Technology Acceptance Questionnaire. TSQ = Telehealth Satisfaction Questionnaire. FRP = Facilitator Rating Profile.
**p* < .05; ***p* < .01; ****p* < .001

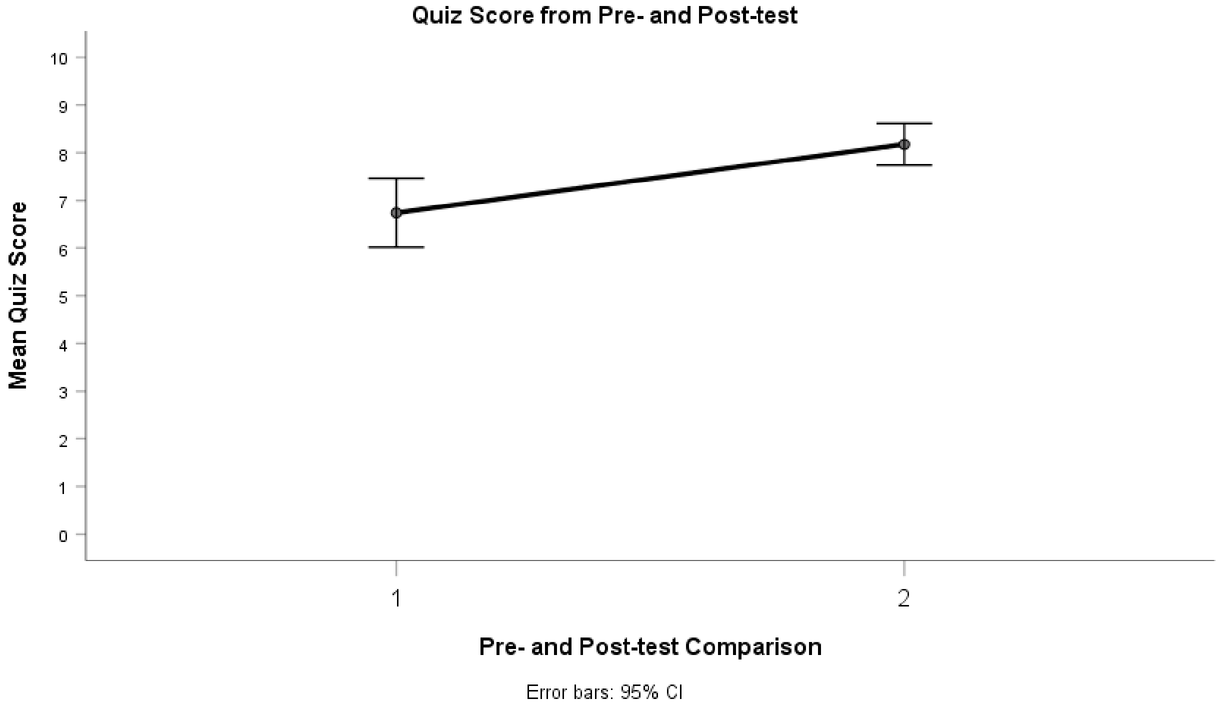

Figure 1. Comparison of means with 95% CIs from pre- to post-test on workshop knowledge quizzes.

Appendix A

Appendix A

ID#________________________

Dear Caregiver,

This study examines your experience of this Families First challenging behaviors workshop. We are asking you to answer some questions about

1. your and your child's background,
2. your child's behaviors,
3. your knowledge of child development routines related to the workshop, and
4. your thoughts and experiences about attending this workshop.

We will have some questions before and after the workshop, as well as about a month from now.

All of your answers will be confidential, and only viewed by members of the research team. We will not share your information or answers outside of the research team. Your participation is voluntary. There is no penalty for choosing not to participate or for quitting at any time.

When you are giving your answers:
1. Do not include your name unless you wish to; otherwise, your answers will be confidential.
2. Be honest; there are no right or wrong answers.
3. Please answer each question as best as you can; however, there is no penalty for skipping any questions.

If you have questions about your rights as a research participant, you may contact:

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ID#_________________________

DIRECTIONS: For the following items, please check boxes related to the best fitting answer and/or write in a short response where asked. Please complete every applicable item to your best knowledge.

(1) **Please, indicate how you identify your gender. Check the box next to the most applicable response:**

☐ 1. Female ☐ 2. Male ☐ 3. Other, please specify: ___________________

(2) **With what race/ethnicity do you most closely identify?**

☐ 1 American Indian or Alaskan Native
☐ 2 Asian or Pacific Islander
☐ 3 Black and/or African American
☐ 4 Middle Eastern and/or North African
☐ 5 Native Hawaiian and/or Other Pacific Islander
☐ 6 White and/or Caucasian
☐ 7 Other, please specify: ____

(3) **Please write in your age (in years)** _______ years.

(4) **Do you speak any language other than English as your primary language?**

☐ 1. No ☐ 2. Yes

(5) **If "Yes," please specify all other languages spoken:** ____

(6) **Please, indicate your child's gender. Check the box next to the most applicable response:**

☐ 1. Female ☐ 2. Male ☐ 3. Other, please specify: ___________________

(7) **With what race/ethnicity do your child most closely identify?**

☐ 1 American Indian or Alaskan Native
☐ 2 Asian or Pacific Islander
☐ 3 Black and/or African American
☐ 4 Middle Eastern and/or North African
☐ 5 Native Hawaiian and/or Other Pacific Islander
☐ 6 White and/or Caucasian
☐ 7 Other, please specify: ____

(8) **Please write in your child's age (in years)** __________ years.

(9) **Does your child have diagnosis of Autism?**

☐ 1. No ☐ 2. Yes

(10) **Does your child have any other psychological or behavioral diagnosis?**

☐ 1. No ☐ 2. Yes

Which: ____

(11) **Does your child receive special services in school?**

☐ 1. No ☐ 2. Yes

Which: ____

(12) **Does your child receive special services at home?**

☐ 1. No ☐ 2. Yes

Which: ____

(13) **Have you attended a Families First Workshop before?**

☐ 1. No ☐ 2. Yes

Which: ____

ID#________________________

DIRECTIONS: Rate the following items related to your child's behavior over the course of the last month.

	ROC						
1	How severe are your child's challenging behaviors	Mild 1	2	3	4	5	Most Severe 6
2	How manageable are your child's challenging behaviors	Easily Managed 1	2	3	4	5	Un-manageable 6
3	How tolerable are your child's challenging behaviors	Easily Tolerated 1	2	3	4	5	Intolerable 6

ID#________________________

DIRECTIONS: The following questions are related to different common aspects of challenging behaviors.
Please select the answer that **best** fits each question by circling the letter next to it.

1. Every time Chrissy kneels next to Thomas and says, “hi!” Thomas yells “no!” and spits at her. Chrissy then moves away. What is Thomas likely trying to do?
a. Make sure only Chrissy can get the toys.
b. Have Chrissy play with him.
c. Get attention from Chrissy.
d. Get away from interacting with Chrissy.

2. You can ensure the success of a replacement behavior if
a. You ask your child to do it after the challenging behavior happens.
b. The replacement behavior gets a different need met.
c. You ask your child to do it before a challenging behavior happens.
d. You assume your child already knows it and only needs to be motivated.

3. An example of an antecedent is
a. A bell ringing when Jill is done cleaning up.
b. A bell that lets Jill know **it is time to clean up.**
c. Jill getting to ring a bell if she cleans up.
d. Jill is cleaning up to get to listen to music.

4. To help your child learn how to follow your directions when he refuses, it could be helpful to
a. Repeating instructions over and over
b. Immediately prompting so your child does not have time to do it wrong
c. Telling your child all of the steps at once
d. Repeat the instruction a couple times, then use prompting

5. A consequence is most powerful when it occurs
a. right before a behavior.
b. after a child has 20-30 minutes to think about his behavior.
c. right after a behavior
d. it depends on the child.

6. When using prompting or redirection, you should
a. Modify the expectation for “follow through” as needed
b. Redirect back to an activity your child loves
c. Allow your child to stop doing an activity they do not like
d. Provide multiple, consecutive verbal cues

7. Peyton puts away all of her crayons in order to watch her favorite cartoon. This behavior likely occurs to
a. Escape from adult attention.
b. Access to an activity.
c. Escape from an activity.
d. Access to adult attention.

8. When you give your child a reward for completing a task you should
a. Always go for the biggest reward.
b. Avoid giving a verbal praise because it can cause confusion
c. Remain neutral
d. Give a verbal praise along with the reward.

9. Which of the following would be considered a behavior?
a. Being mad at mom because it is bath time.
b. Being anxious to take a bath.
c. Screaming to get out of taking a bath.
d. Feeling sad at mom because it is bath time.

10. A First-Then Board is most likely to be successful when you
a. Give the “First” immediately prior to the “Then” task.
b. Give the First” long before the “Then” task.
c. Only put on tasks your child will want to do
d. Only put on tasks your child does not want to do.

Appendix B

Appendix B

ID#__________________________

Dear Caregiver,

This study examines your experience of this Families First challenging behaviors workshop. We are asking you to answer some questions about

1. your and your child's background,
2. your child's behaviors,
3. your knowledge of child development routines related to the workshop, and
4. your thoughts and experiences about attending this workshop.

We will have some questions before and after the workshop, as well as about a month from now.

All of your answers will be confidential, and only viewed by members of the research team. We will not share your information or answers outside of the research team. Your participation is voluntary. There is no penalty for choosing not to participate or for quitting at any time.

When you are giving your answers:
1. Do not include your name unless you wish to; otherwise, your answers will be confidential.
2. Be honest; there are no right or wrong answers.
3. Please answer each question as best as you can; however, there is no penalty for skipping any questions.

If you have questions about your rights as a research participant, you may contact:

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DIRECTIONS: Below are questions about your experience with this workshop. Rate each statement based on how much you agree with the statement.

	SUTAQ	**Strongly Disagree 1**	**Disagree 2**	**Slightly Disagree 3**	**Slightly Agree 4**	**Agree 5**	**Strongly Agree 6**
1	The workshop received has helped me to improve my child's behavior	1	2	3	4	5	6
2	The workshop received has saved me time in that I did not have to visit another professional	1	2	3	4	5	6
3	The workshop has made me more actively involved in my child's behavior	1	2	3	4	5	6
4	The workshop should be recommended to people with a similar condition to my child's	1	2	3	4	5	6
5	The workshop can certainly be a good addition to my child's regular health or social care	1	2	3	4	5	6
6	The workshop has allowed me to be less concerned about my child's health and/or social care	1	2	3	4	5	6
7	The workshop has made me feel uncomfortable, e.g., physically or emotionally	1	2	3	4	5	6
8	The workshop received has interfered with my child's everyday routine	1	2	3	4	5	6

	TSQ	**Strongly Disagree 1**	**Disagree 2**	**Slightly Disagree 3**	**Slightly Agree 4**	**Agree 5**	**Strongly Agree 6**
9	I was satisfied with the voice quality	1	2	3	4	5	6
10	I was satisfied with the video quality	1	2	3	4	5	6
11	It was easy getting to this workshop	1	2	3	4	5	6
12	I was satisfied with the length of time in the workshop	1	2	3	4	5	6
13	I was satisfied with the explanation of the services provided in the workshop	1	2	3	4	5	6
14	Overall, I am satisfied with the quality of service being provided at the workshop	1	2	3	4	5	6

	FRP	**Strongly Disagree 1**	**Disagree 2**	**Slightly Disagree 3**	**Slightly Agree 4**	**Agree 5**	**Strongly Agree 6**
15	The facilitators listened to my concerns.	1	2	3	4	5	6
16	Communication with the facilitators was timely and helpful.	1	2	3	4	5	6
17	I would choose to seek help from these facilitators again in the future.	1	2	3	4	5	6
18	I would recommend that colleagues seek help from these facilitators.	1	2	3	4	5	6
19	The facilitators were helpful.	1	2	3	4	5	6
20	The workshop went as planned.	1	2	3	4	5	6
21	The facilitators were effective.	1	2	3	4	5	6
22	I was satisfied with the facilitators.	1	2	3	4	5	6

Appendix C

Chi-Square Comparisons for Missing Data:

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Gender * Missing	50	92.6%	4	7.4%	54	100.0%
Race/Ethnicity * Missing	49	90.7%	5	9.3%	54	100.0%
Language * Missing	50	92.6%	4	7.4%	54	100.0%
Child's Gender * Missing	42	77.8%	12	22.2%	54	100.0%
Child's Race Ethnicity * Missing	40	74.1%	14	25.9%	54	100.0%
ASD Diagnosis * Missing	43	79.6%	11	20.4%	54	100.0%
Other Diagnosis * Missing	40	74.1%	14	25.9%	54	100.0%
Special Services in School * Missing	40	74.1%	14	25.9%	54	100.0%
Special Services at Home * Missing	40	74.1%	14	25.9%	54	100.0%

Gender * Missing

Crosstab

			Missing		
			.00	1.00	Total
Gender	1	Count	5_a	36_a	41
		Expected Count	4.1	36.9	41.0
		% within Gender	12.2%	87.8%	100.0%
		% within Missing	100.0%	80.0%	82.0%
		% of Total	10.0%	72.0%	82.0%
	2	Count	0_a	9_a	9
		Expected Count	.9	8.1	9.0
		% within Gender	0.0%	100.0%	100.0%
		% within Missing	0.0%	20.0%	18.0%
		% of Total	0.0%	18.0%	18.0%
Total		Count	5	45	50
		Expected Count	5.0	45.0	50.0
		% within Gender	10.0%	90.0%	100.0%

	% within Missing	100.0%	100.0%	100.0%
	% of Total	10.0%	90.0%	100.0%

Each subscript letter denotes a subset of Missing categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.220[a]	1	.269		
Continuity Correction[b]	.241	1	.624		
Likelihood Ratio	2.103	1	.147		
Fisher's Exact Test				.570	.354
Linear-by-Linear Association	1.195	1	.274		
N of Valid Cases	50				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .90.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.156	.269
	Cramer's V	.156	.269
N of Valid Cases		50	

Race/Ethnicity * Missing

Crosstab

			Missing		Total
			.00	1.00	
Race/Ethnicity	2	Count	1_a	2_a	3
		Expected Count	.3	2.7	3.0
		% within Race/Ethnicity	33.3%	66.7%	100.0%
		% within Missing	20.0%	4.5%	6.1%
		% of Total	2.0%	4.1%	6.1%
	3	Count	0_a	3_a	3
		Expected Count	.3	2.7	3.0
		% within Race/Ethnicity	0.0%	100.0%	100.0%
		% within Missing	0.0%	6.8%	6.1%
		% of Total	0.0%	6.1%	6.1%
	6	Count	3_a	39_a	42
		Expected Count	4.3	37.7	42.0
		% within Race/Ethnicity	7.1%	92.9%	100.0%
		% within Missing	60.0%	88.6%	85.7%
		% of Total	6.1%	79.6%	85.7%
	7	Count	1_a	0_b	1
		Expected Count	.1	.9	1.0
		% within Race/Ethnicity	100.0%	0.0%	100.0%
		% within Missing	20.0%	0.0%	2.0%
		% of Total	2.0%	0.0%	2.0%
Total		Count	5	44	49
		Expected Count	5.0	44.0	49.0
		% within Race/Ethnicity	10.2%	89.8%	100.0%
		% within Missing	100.0%	100.0%	100.0%
		% of Total	10.2%	89.8%	100.0%

Each subscript letter denotes a subset of Missing categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.322[a]	3	.010
Likelihood Ratio	6.861	3	.076
Linear-by-Linear Association	.145	1	.703
N of Valid Cases	49		

a. 7 cells (87.5%) have expected count less than 5. The minimum expected count is .10.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.481	.010
	Cramer's V	.481	.010
N of Valid Cases		49	

Language * Missing

Crosstab

			Missing		Total
			.00	1.00	
Language	1	Count	3_a	43_b	46
		Expected Count	4.6	41.4	46.0
		% within Language	6.5%	93.5%	100.0%
		% within Missing	60.0%	95.6%	92.0%
		% of Total	6.0%	86.0%	92.0%
	2	Count	2_a	2_b	4
		Expected Count	.4	3.6	4.0
		% within Language	50.0%	50.0%	100.0%
		% within Missing	40.0%	4.4%	8.0%
		% of Total	4.0%	4.0%	8.0%
Total		Count	5	45	50
		Expected Count	5.0	45.0	50.0
		% within Language	10.0%	90.0%	100.0%
		% within Missing	100.0%	100.0%	100.0%
		% of Total	10.0%	90.0%	100.0%

Each subscript letter denotes a subset of Missing categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.729[a]	1	.005		
Continuity Correction[b]	3.653	1	.056		
Likelihood Ratio	4.783	1	.029		
Fisher's Exact Test				.045	.045
Linear-by-Linear Association	7.575	1	.006		
N of Valid Cases	50				

a. 3 cells (75.0%) have expected count less than 5. The minimum expected count is .40.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	-.393	.005
	Cramer's V	.393	.005
N of Valid Cases		50	

Child's Gender * Missing

Crosstab

			Missing		Total
			.00	1.00	
Child's Gender	1	Count	2$_{a}$	3$_{b}$	5
		Expected Count	.5	4.5	5.0
		% within Child's Gender	40.0%	60.0%	100.0%
		% within Missing	50.0%	7.9%	11.9%
		% of Total	4.8%	7.1%	11.9%
	2	Count	2$_{a}$	30$_{a}$	32
		Expected Count	3.0	29.0	32.0
		% within Child's Gender	6.3%	93.8%	100.0%
		% within Missing	50.0%	78.9%	76.2%
		% of Total	4.8%	71.4%	76.2%
	3	Count	0$_{a}$	5$_{a}$	5
		Expected Count	.5	4.5	5.0
		% within Child's Gender	0.0%	100.0%	100.0%
		% within Missing	0.0%	13.2%	11.9%
		% of Total	0.0%	11.9%	11.9%
Total		Count	4	38	42
		Expected Count	4.0	38.0	42.0
		% within Child's Gender	9.5%	90.5%	100.0%
		% within Missing	100.0%	100.0%	100.0%
		% of Total	9.5%	90.5%	100.0%

Each subscript letter denotes a subset of Missing categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.314[a]	2	.043
Likelihood Ratio	4.725	2	.094
Linear-by-Linear Association	4.532	1	.033
N of Valid Cases	42		

a. 5 cells (83.3%) have expected count less than 5. The minimum expected count is .48.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.388	.043
	Cramer's V	.388	.043
N of Valid Cases		42	

Child's Race Ethnicity * Missing

Crosstab

			Missing		
			.00	1.00	Total
Child's Race Ethnicity	3	Count	0_a	1_a	1
		Expected Count	.1	.9	1.0
		% within Child's Race Ethnicity	0.0%	100.0%	100.0%
		% within Missing	0.0%	2.8%	2.5%
		% of Total	0.0%	2.5%	2.5%
	6	Count	3_a	34_a	37
		Expected Count	3.7	33.3	37.0
		% within Child's Race Ethnicity	8.1%	91.9%	100.0%
		% within Missing	75.0%	94.4%	92.5%
		% of Total	7.5%	85.0%	92.5%
	7	Count	1_a	1_a	2
		Expected Count	.2	1.8	2.0
		% within Child's Race Ethnicity	50.0%	50.0%	100.0%
		% within Missing	25.0%	2.8%	5.0%
		% of Total	2.5%	2.5%	5.0%
Total		Count	4	36	40
		Expected Count	4.0	36.0	40.0
		% within Child's Race Ethnicity	10.0%	90.0%	100.0%
		% within Missing	100.0%	100.0%	100.0%
		% of Total	10.0%	90.0%	100.0%

Each subscript letter denotes a subset of Missing categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.814[a]	2	.149
Likelihood Ratio	2.410	2	.300
Linear-by-Linear Association	1.194	1	.274
N of Valid Cases	40		

a. 5 cells (83.3%) have expected count less than 5. The minimum expected count is .10.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.309	.149
	Cramer's V	.309	.149
N of Valid Cases		40	

ASD Diagnosis * Missing

Crosstab

			Missing		
			.00	1.00	Total
ASD Diagnosis	1	Count	2_a	8_a	10
		Expected Count	.9	9.1	10.0
		% within ASD Diagnosis	20.0%	80.0%	100.0%
		% within Missing	50.0%	20.5%	23.3%
		% of Total	4.7%	18.6%	23.3%
	2	Count	2_a	31_a	33
		Expected Count	3.1	29.9	33.0
		% within ASD Diagnosis	6.1%	93.9%	100.0%
		% within Missing	50.0%	79.5%	76.7%
		% of Total	4.7%	72.1%	76.7%
Total		Count	4	39	43
		Expected Count	4.0	39.0	43.0
		% within ASD Diagnosis	9.3%	90.7%	100.0%
		% within Missing	100.0%	100.0%	100.0%
		% of Total	9.3%	90.7%	100.0%

Each subscript letter denotes a subset of Missing categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.767[a]	1	.184		
Continuity Correction[b]	.501	1	.479		
Likelihood Ratio	1.517	1	.218		
Fisher's Exact Test				.226	.226
Linear-by-Linear Association	1.726	1	.189		
N of Valid Cases	43				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .93.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.203	.184
	Cramer's V	.203	.184
N of Valid Cases		43	

Other Diagnosis * Missing

Crosstab

			Missing		
			.00	1.00	Total
Other Diagnosis	1	Count	4a	26a	30
		Expected Count	3.0	27.0	30.0
		% within Other Diagnosis	13.3%	86.7%	100.0%
		% within Missing	100.0%	72.2%	75.0%
		% of Total	10.0%	65.0%	75.0%
	2	Count	0a	10a	10
		Expected Count	1.0	9.0	10.0
		% within Other Diagnosis	0.0%	100.0%	100.0%
		% within Missing	0.0%	27.8%	25.0%
		% of Total	0.0%	25.0%	25.0%
Total		Count	4	36	40
		Expected Count	4.0	36.0	40.0
		% within Other Diagnosis	10.0%	90.0%	100.0%
		% within Missing	100.0%	100.0%	100.0%
		% of Total	10.0%	90.0%	100.0%

Each subscript letter denotes a subset of Missing categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.481[a]	1	.224		
Continuity Correction[b]	.370	1	.543		
Likelihood Ratio	2.446	1	.118		
Fisher's Exact Test				.556	.300
Linear-by-Linear Association	1.444	1	.229		
N of Valid Cases	40				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.00.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.192	.224
	Cramer's V	.192	.224
N of Valid Cases		40	

Special Services in School * Missing

Crosstab

			Missing		Total
			.00	1.00	
Special Services in School	1	Count	2_{a}	13_{a}	15
		Expected Count	1.5	13.5	15.0
		% within Special Services in School	13.3%	86.7%	100.0%
		% within Missing	50.0%	36.1%	37.5%
		% of Total	5.0%	32.5%	37.5%
	2	Count	2_{a}	23_{a}	25
		Expected Count	2.5	22.5	25.0
		% within Special Services in School	8.0%	92.0%	100.0%
		% within Missing	50.0%	63.9%	62.5%
		% of Total	5.0%	57.5%	62.5%
Total		Count	4	36	40
		Expected Count	4.0	36.0	40.0
		% within Special Services in School	10.0%	90.0%	100.0%
		% within Missing	100.0%	100.0%	100.0%
		% of Total	10.0%	90.0%	100.0%

Each subscript letter denotes a subset of Missing categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.296[a]	1	.586		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.288	1	.592		
Fisher's Exact Test				.622	.484
Linear-by-Linear Association	.289	1	.591		
N of Valid Cases	40				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.50.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.086	.586
	Cramer's V	.086	.586
N of Valid Cases		40	

Special Services at Home * Missing

Crosstab

			Missing		
			.00	1.00	Total
Special Services at Home	1	Count	3_a	21_a	24
		Expected Count	2.4	21.6	24.0
		% within Special Services at Home	12.5%	87.5%	100.0%
		% within Missing	75.0%	58.3%	60.0%
		% of Total	7.5%	52.5%	60.0%
	2	Count	1_a	15_a	16
		Expected Count	1.6	14.4	16.0
		% within Special Services at Home	6.3%	93.8%	100.0%
		% within Missing	25.0%	41.7%	40.0%
		% of Total	2.5%	37.5%	40.0%
Total		Count	4	36	40
		Expected Count	4.0	36.0	40.0
		% within Special Services at Home	10.0%	90.0%	100.0%
		% within Missing	100.0%	100.0%	100.0%
		% of Total	10.0%	90.0%	100.0%

Each subscript letter denotes a subset of Missing categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.417[a]	1	.519		
Continuity Correction[b]	.012	1	.914		
Likelihood Ratio	.440	1	.507		
Fisher's Exact Test				.638	.471
Linear-by-Linear Association	.406	1	.524		
N of Valid Cases	40				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.60.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.102	.519
	Cramer's V	.102	.519
N of Valid Cases		40	

Independent Sample Mann-Whitney U-test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of # correct pre-test is the same across categories of Missing.	Independent-Samples Mann-Whitney U Test	.426[a]	Retain the null hypothesis.
2	The distribution of # correct post-test is the same across categories of Missing.	Independent-Samples Mann-Whitney U Test	.460[a]	Retain the null hypothesis.
3	The distribution of SymptomSeverity is the same across categories of Missing.	Independent-Samples Mann-Whitney U Test	.373[a]	Retain the null hypothesis.
4	The distribution of SUTAQ1 is the same across categories of Missing.	Independent-Samples Mann-Whitney U Test	.768[a]	Retain the null hypothesis.
5	The distribution of TSQ is the same across categories of Missing.	Independent-Samples Mann-Whitney U Test	.393[a]	Retain the null hypothesis.
6	The distribution of FRP is the same across categories of Missing.	Independent-Samples Mann-Whitney U Test	.271[a]	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .010.

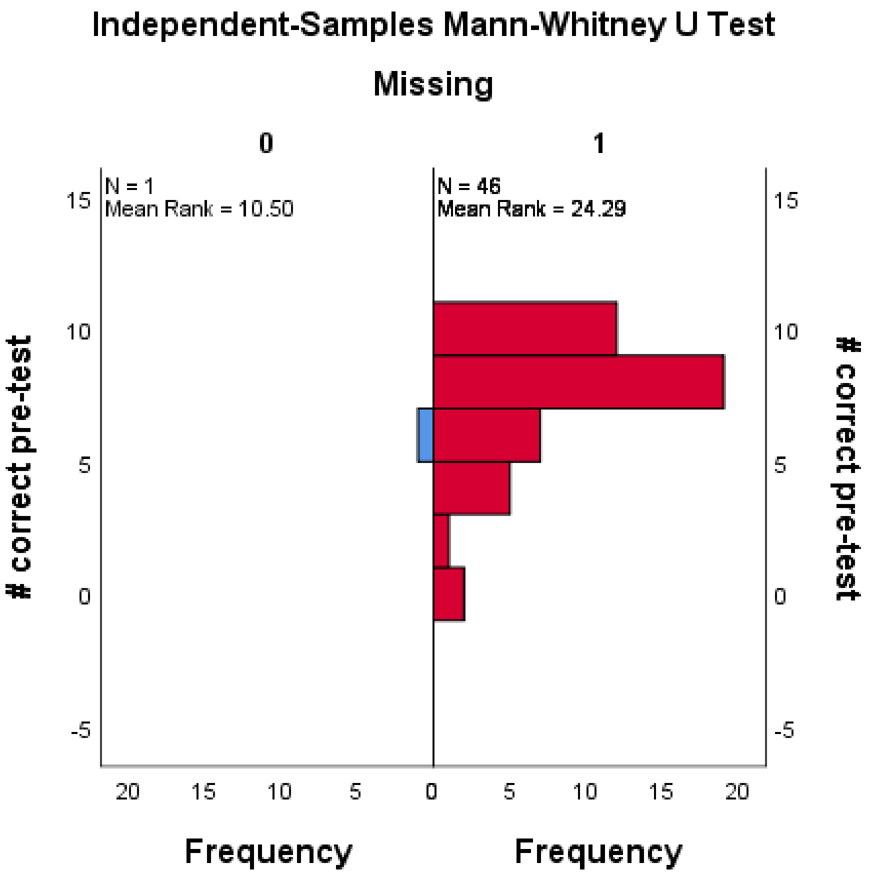
a. Exact significance is displayed for this test.

Independent-Samples Mann-Whitney U Test

correct pre-test across Missing

Independent-Samples Mann-Whitney U Test Summary

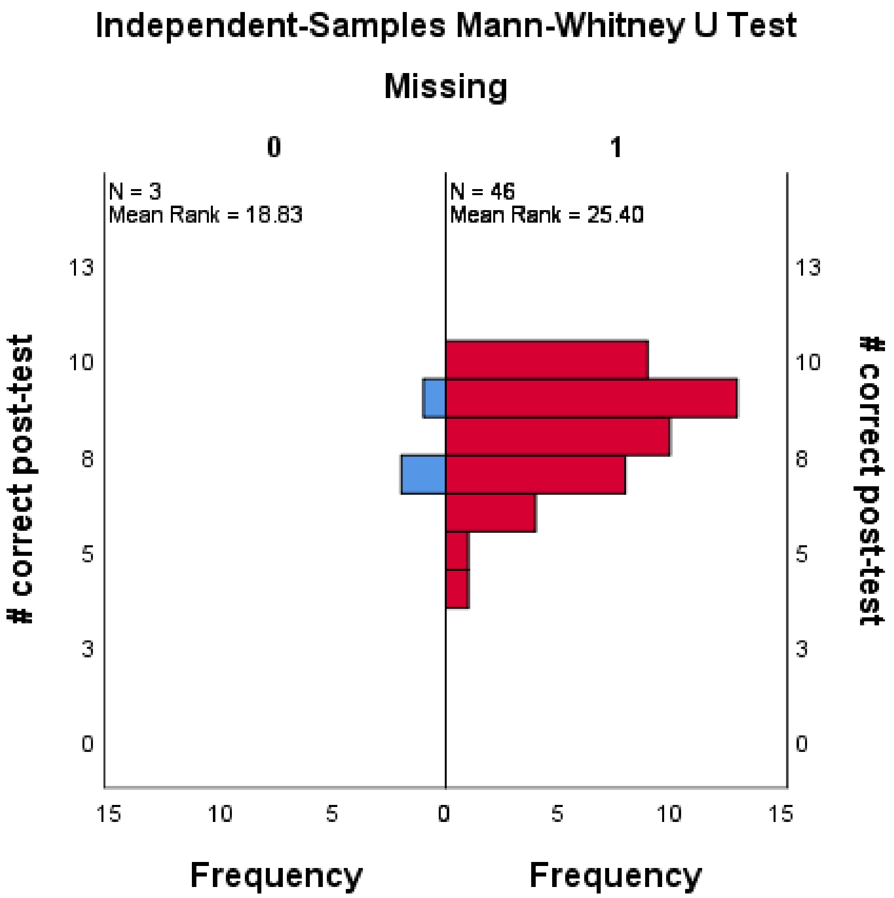
Total N	47
Mann-Whitney U	36.500
Wilcoxon W	1117.500
Test Statistic	36.500
Standard Error	13.376
Standardized Test Statistic	1.009
Asymptotic Sig.(2-sided test)	.313
Exact Sig.(2-sided test)	.426



correct post-test across Missing

Independent-Samples Mann-Whitney U Test Summary

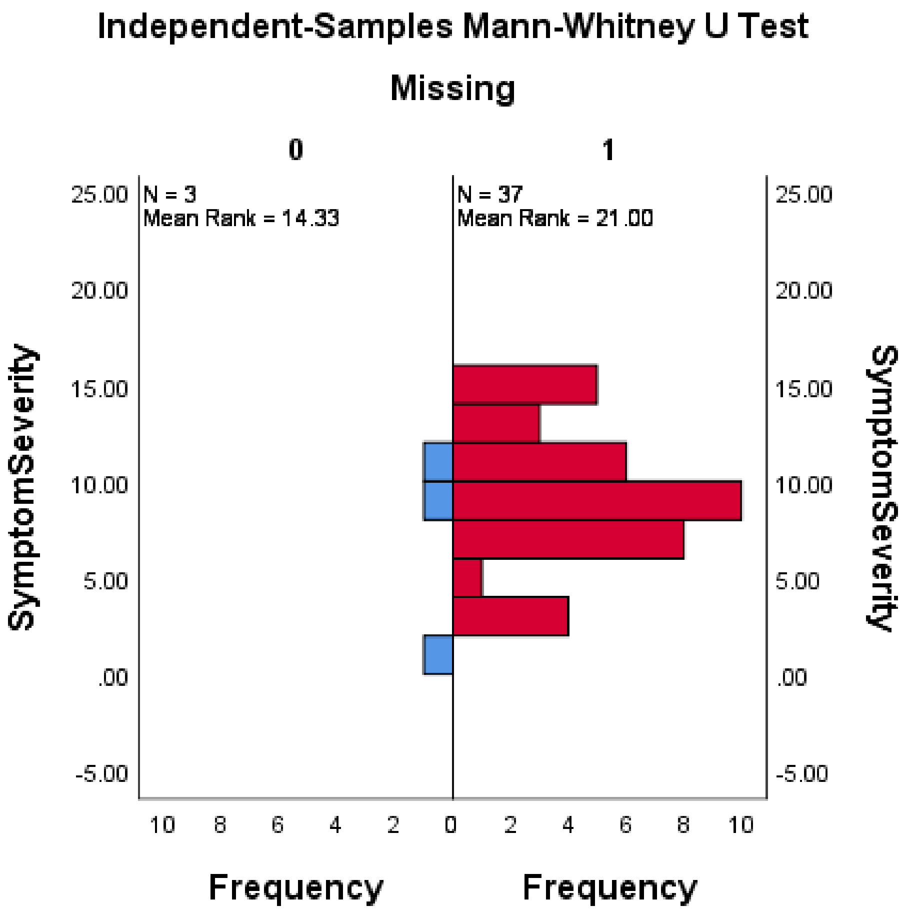
Total N	49
Mann-Whitney U	87.500
Wilcoxon W	1168.500
Test Statistic	87.500
Standard Error	23.413
Standardized Test Statistic	.790
Asymptotic Sig.(2-sided test)	.429
Exact Sig.(2-sided test)	.460



Symptom Severity across Missing

Independent-Samples Mann-Whitney U Test Summary

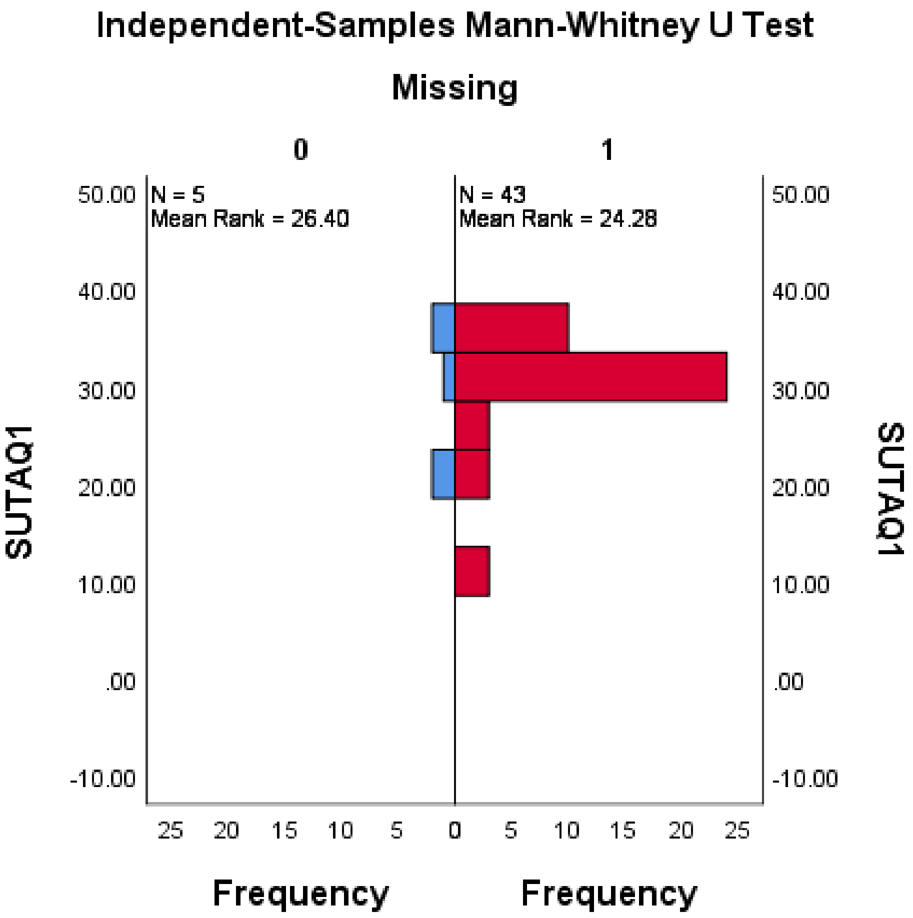
Total N	40
Mann-Whitney U	74.000
Wilcoxon W	777.000
Test Statistic	74.000
Standard Error	19.270
Standardized Test Statistic	.960
Asymptotic Sig.(2-sided test)	.337
Exact Sig.(2-sided test)	.373



SUTAQ1 across Missing

Independent-Samples Mann-Whitney U Test Summary

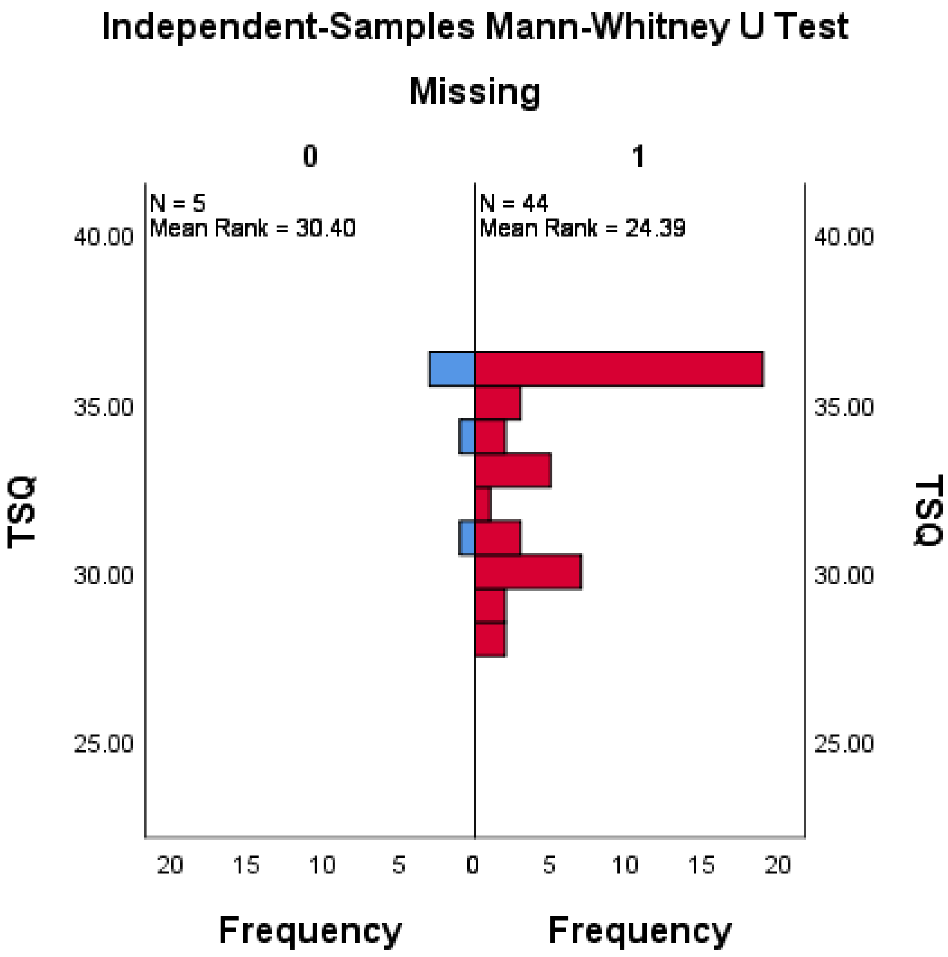
Total N	48
Mann-Whitney U	98.000
Wilcoxon W	1044.000
Test Statistic	98.000
Standard Error	29.426
Standardized Test Statistic	-.323
Asymptotic Sig.(2-sided test)	.747
Exact Sig.(2-sided test)	.768



TSQ across Missing

Independent-Samples Mann-Whitney U Test Summary

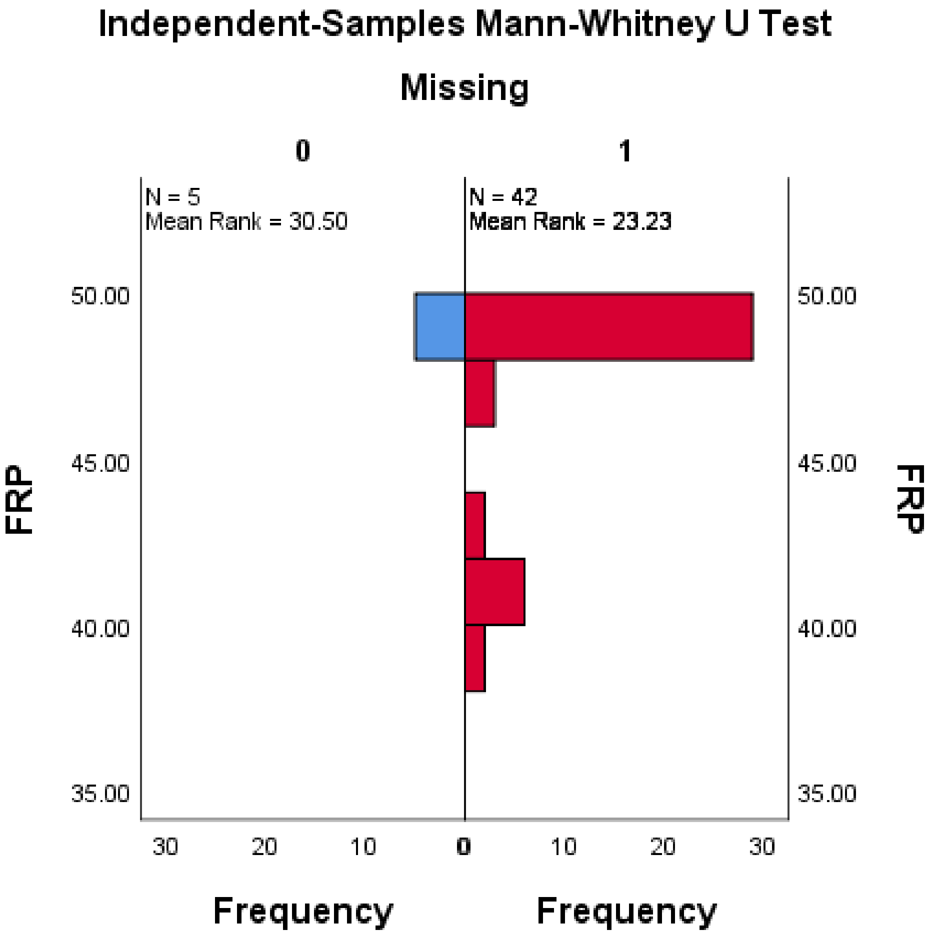
Total N	49
Mann-Whitney U	83.000
Wilcoxon W	1073.000
Test Statistic	83.000
Standard Error	28.798
Standardized Test Statistic	-.938
Asymptotic Sig.(2-sided test)	.348
Exact Sig.(2-sided test)	.393

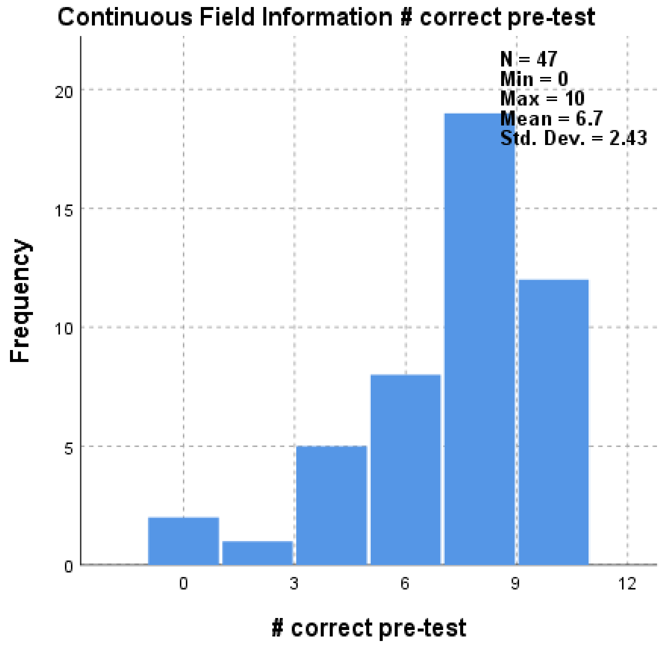


FRP across Missing

Independent-Samples Mann-Whitney U Test Summary

Total N	47
Mann-Whitney U	72.500
Wilcoxon W	975.500
Test Statistic	72.500
Standard Error	22.824
Standardized Test Statistic	-1.424
Asymptotic Sig.(2-sided test)	.154
Exact Sig.(2-sided test)	.271




Continuous Field Information # correct pre-test
N = 47
Min = 0
Max = 10
Mean = 6.7
Std. Dev. = 2.43
Frequency
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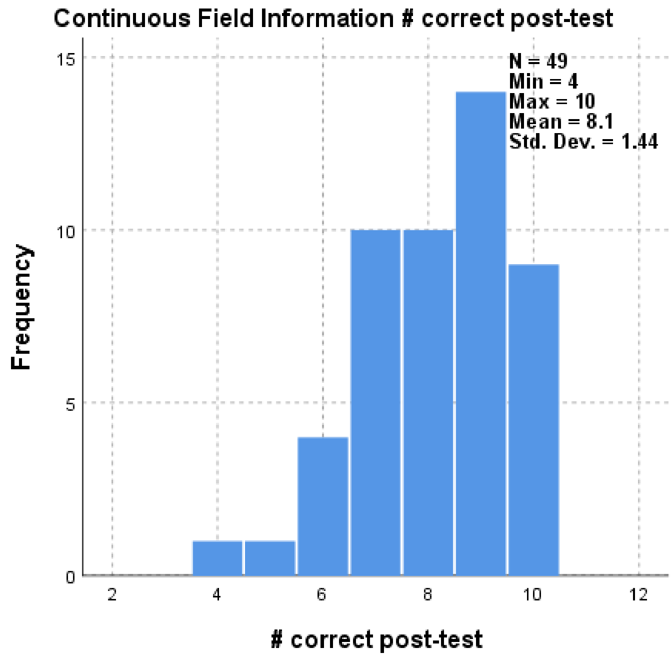
5
10
15
20
0
3
6
9
12
correct pre-test


Continuous Field Information # correct post-test
N = 49
Min = 4
Max = 10
Mean = 8.1
Std. Dev. = 1.44
Frequency
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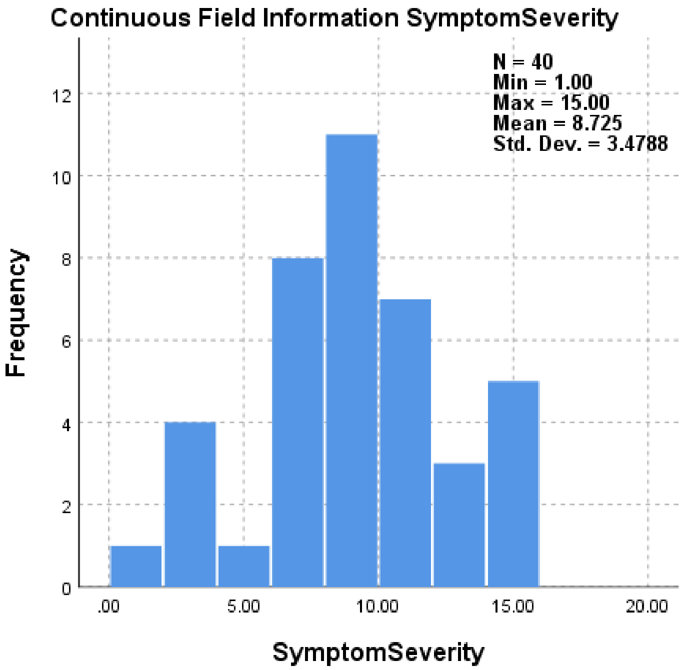
10
15
2
4
6
8
10
12
correct post-test


Continuous Field Information SymptomSeverity
N = 40
Min = 1.00
Max = 15.00
Mean = 8.725
Std. Dev. = 3.4788
Frequency
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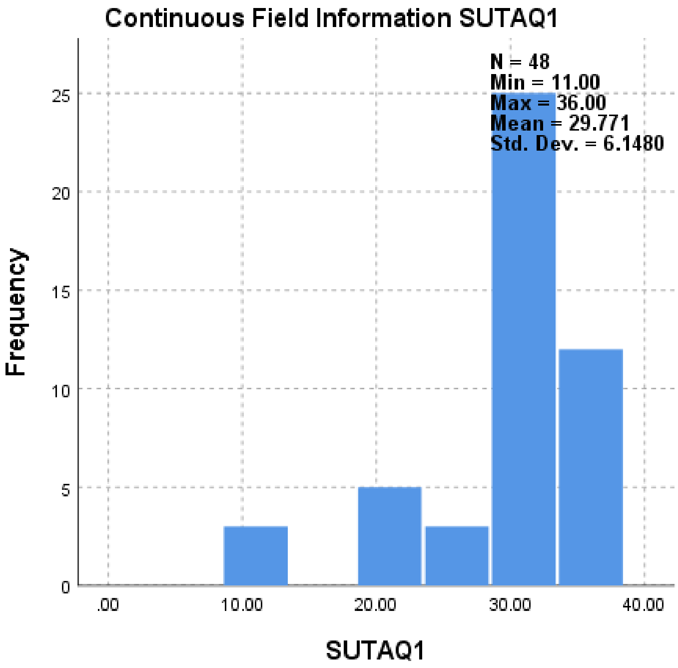
4
6
8
10
12
.00
5.00
10.00
15.00
20.00
SymptomSeverity


Continuous Field Information SUTAQ1
N = 48
Min = 11.00
Max = 36.00
Mean = 29.771
Std. Dev. = 6.1480
Frequency
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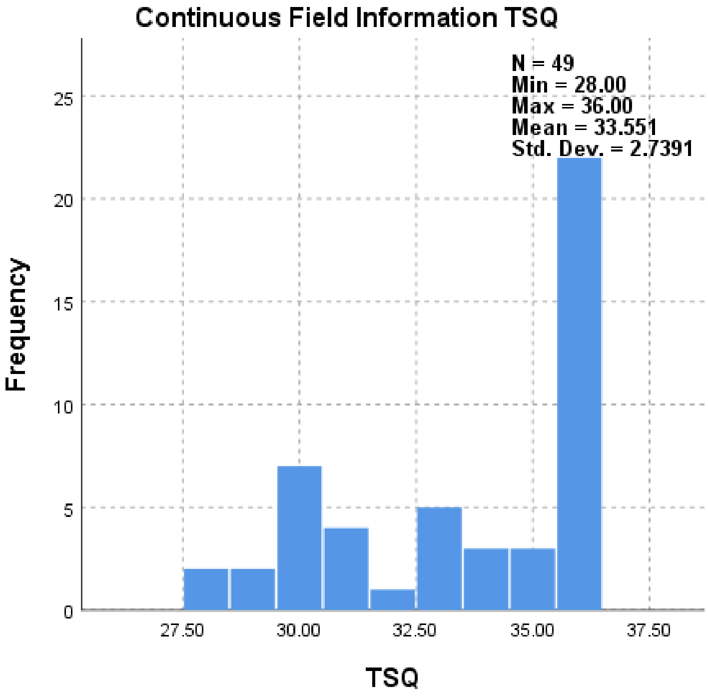
10
15
20
25
.00
10.00
20.00
30.00
40.00
SUTAQ1


Continuous Field Information TSQ
N = 49
Min = 28.00
Max = 36.00
Mean = 33.551
Std. Dev. = 2.7391
Frequency
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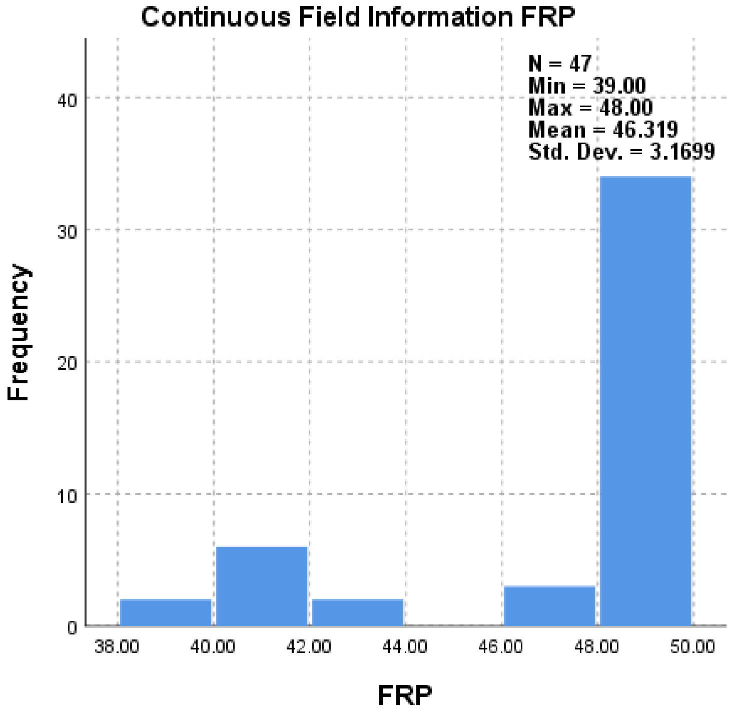
15
20
25
27.50
30.00
32.50
35.00
37.50
TSQ


Continuous Field Information FRP
N = 47
Min = 39.00
Max = 48.00
Mean = 46.319
Std. Dev. = 3.1699
Frequency
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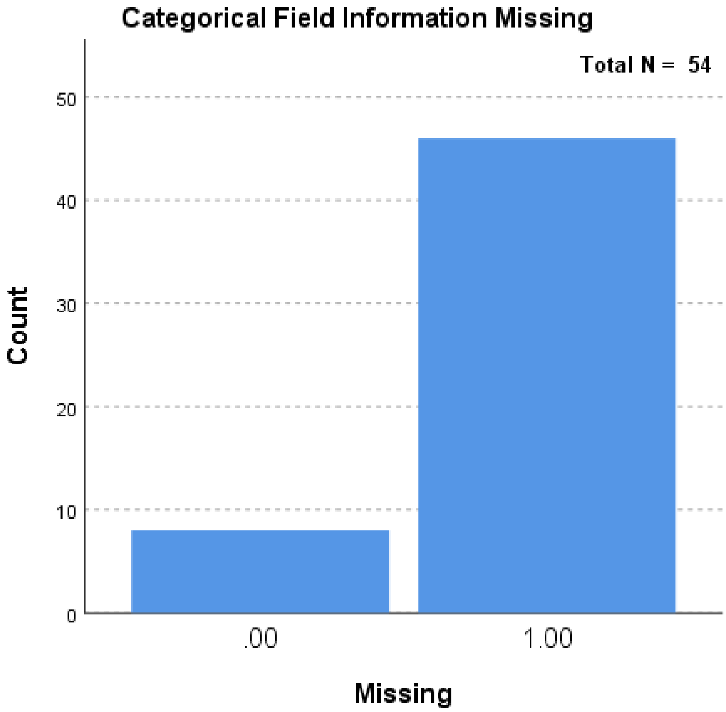
20
30
40
38.00
40.00
42.00
44.00
46.00
48.00
50.00
FRP


Categorical Field Information Missing
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10
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1.00
Missing