DEVELOPMENT AND VALIDATION OF THE VIDEO MANUAL FOR DIFFERENT MANAGEMENT TECHNIQUES IN CHILDREN WITH AUTISM SPECTRUM DISORDERS

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Autism Spectrum Disorder (ASD) is a group of disorders, which needs specific management techniques, focusing on speech and language aspects, behavioral aspects and sensory aspects. The applications of management techniques vary from each other while dealing with children with ASD. Hence, it is very necessary to develop and carry out field-testing of the video manual for management techniques in children with ASD. The manuscript could be used as an educational material and reference for clinicians and parents of children with ASD. The video manual will help both clinicians and parents to deal with these children in an effective manner.

ASD is a developmental child language disorder, which is still a field of mystery in the areas of diagnosis, assessment, and treatment. The condition received little attention until Leo Kanner (1943) a psychiatrist, who noted that 11 of his patients showed remarkably similar symptoms and were later on labeled as "early infantile autism". The children with ASD exhibit both delay and deviance in numerous developmental aspects; classically onset is in the first three years of life (Short & Schopler, 1988; Stone et al., 1994). The literature states compound causes but none of them is widely accepted. The knowledge base and understanding of autism continues to expand as research progresses; there is yet much to learn and research.

Pervasive Developmental Disorders (PDDs) is the term used in the 'Diagnostics and Statistical Manual of Mental Disorders' (DSM III, 1980) to describe a cluster of symptoms portrayed; "impaired social skills, impaired communication skills, and restricted repetitive behaviors." Wing (1981) coined the term "autistic continuum" and later in 1988 it was

modified into Autistic Spectrum Disorders. The introverted withdrawn child is at one extreme of the scale, the submissive child lies in centre, and active child with odd manner is at the other extreme of the continuum. The category of PDDs sketched in the DSM-IV (APA, 1994) included Autistic disorders, Asperger syndrome, and Pervasive developmental disorder – not otherwise specified (PDD NOS). The PDDs are distinguished from each other by the onset, gender and by the symptoms exhibited. According to the 'DSM-IV' (TR, 2000) ASD can be sub grouped into five types: Autism, Asperger syndrome, Childhood disintegration disorders, Rett syndrome, and PDD-NOS. The DSM V, latest edition includes all the five disorders in one single group without sub-grouping (APA, 2013).

The main challenge about ASD is the diagnosis and management in various settings as these children are heterogeneous in the symptom complexes. The assessment process depends on information gathered from parents, caregivers, and direct observation by professionals. The early identification and diagnosis of the mild ASD/ PDDs is very challenging to both parents and the professionals. Once diagnosed, management of this population is very crucial and important. Children with ASD are exceptional and unique in nature. Management techniques vary with these children depending on the characteristic features exhibited (Brunner & Seung, 2009). We also know that there is no established cure until now for complete treatment of ASD. However, using different medical and nonmedical (behavioral, speech and language, etc.) management techniques symptoms could be diminished and child's ability to communication could be enhanced.

The general intervention approaches for children with ASD can be classified as developmental approach, behavioral approach, naturalistic behavioral approach, classroom based interventions and social skill interventions (Brunner & Seung, 2009). Other generally used approaches are biological & medical approach, physiotherapeutic approach, play

therapies, and sensory-motor approach (Myers & Johnson, 2007). The different management approaches available for children with ASD are briefly mentioned below.

Developmental interventions presume that language development is enhanced by adult–child communications; hence, parental education and training are primary to these treatment methods. These approaches center on the functional social communication of the child. The child's verbal productions are not embattled in these approaches, rather, all communicative attempts by the child is targeted (Ingersoll, Dvortcsak, Whalen, & Sikora, 2005). Behaviorism is solely based on the obvious and quantifiable features of human behavior. Therefore, when behaviors become undesirable, it can be modified and/or eliminated. Behaviorism analyzes development as a continuous course in which children play relatively reflexive task. In addition, this general approach is used in both clinical and educational settings.

Natural language training is also referred to as Milieu teaching. The main aim of this approach is to use natural environment to improve communication and generalization skills. In this program, the clinician incorporates a hierarchical strategy and waits for the child's response. This technique is carried out in natural settings to support communication skill for children with developmental disorders. The child develops into the centre of communication and interactions and that leads to improved generalization skills.

Occupational therapy is offered to encourage improvement of motor skills and self-help skills. However, OTs also aid in improving play skills, adapting to classroom, and giving prelinguistic guidance and teaching. The aim of "sensory integration therapy" is to rehabilitate discrepancy in neurologic processing and amalgamation of sensory input to permit the child to intermingle with the situation easily in a specified manner. Bizarre sensory

reactions are the significant features that help to distinguish ASD from other childhood disorders (Myers & Johnson, 2007). Medical management is necessary to control the health issues in children with ASD and that boosts the improvement in communicational aspects to an extent. In addition most of these children have distinctive medical condition such as epilepsy, sleep disturbances, etc. In order to control these features medical management is necessary for them (Myers & Johnson, 2007).

Play Therapy is a new method used for autism management. Play is used as a means to improve child's skill by incorporating child's interests. The major symptoms of ASD are the impaired social and communication aspects and hence this limits their interaction with typically developing peers. Children with autism always show self stimulatory behaviors when objects or things are given to them. Play can be a used as an important tool to teach interaction and sharing skills in children with ASD. Play therapy uses ordinary materials like toys and other general items and allows parents to take a dynamic role during therapy. This will also help to form strong bond between the parents and these children (Homeyer & Morrison, 2008).

Video recording plays an important role in the identification, assessment, and management of different disorders. The videos provide us an explicit idea about the particular condition or situation of an individual. The use of video recordings for assessment and management has become a trend at present time. Video scripting is a written plan for video presentation. The script gives us an idea about the scene and the audio part. Preparing a video script before shooting the video footages helps in better understanding and organization. There are four types of video presentation depending on the purpose: informational, motivational, instructional, and combination of these three types. The Informational videos raise awareness and promote understanding of an idea by providing information and

explanation of a topic. The Motivational videos focus on promoting an attitude about a topic. The instructional videos present procedures on doing things (Goldman et al, 2007).

Video manuscripts of the different techniques that are commonly used for the management of children with ASD will serve as a reference, especially for student clinicians and parents of children with autism. The video-manuscripts will help the clinicians and parents to get a thorough knowledge of the different therapy techniques for efficient clinical application on children with ASD.

Need for the study

The ASD is a heterogeneous population and hence the management of this population is very challenging. The prevalence and incidence of autism is also growing. There are different management techniques available for these children. However, the systematic use of these techniques by both students and parents are still contradictory. Hence, there is a need to develop and field test the use of a video manual for different management techniques for children with ASD. This module will help:

a) To educate and train students about different management techniques for ASD.
b) To educate the parents of children with ASD.
c) To serve as a basis for future research.

Many studies have focused on ASD management techniques but a video module has not been developed. There are very few audio video documentary films available in Indian context and these are mainly used to create awareness and educate the public on communication disorders. Hence, it is necessary to develop a video manual for different management techniques for ASD in Indian context.

Objectives

The main objectives of the present study are

1. To develop a video manual for different management techniques for ASD in Indian context
2. To carry out the field testing and validate the developed video manual to educate and train parents and clinicians in the management of children with ASD

CHAPTER II

REVIEW OF LITERATURE

Professionals who work in the field of ASD often find difficulty with management aspects due to the heterogeneity of the group. The need for a video manual for management techniques is very essential in the clinical set up. It provides a source of reference for the clinicians and parents of autistic children to get a base knowledge of management of these children.

Autism Spectrum Disorders

ASD are characterized by abnormalities in reciprocal social interactions, limited and abnormal patterns of communication, and a restricted, stereotyped, and repetitive repertoire of behaviors, interests and activities. Autism is a clinical syndrome evident after two years and especially diagnosed after third year of life, information regarding features of autism in the first two years was lacking till 1990's (Short & Schopler, 1988; Stone et al., 1994; Sullivan et al., 1990) but later so many home video studies had focused on these aspects (Mahdhaoui et al, 2009). Autism is labeled as spectrum disorders as the symptom occurs in blend with diverse levels of severity. Even though children with ASD share a common set of behavioral characteristics, no two individuals are identical. The individuals with ASD improves in functioning over time, unfortunately, they never completely grow out of autism. It is a lifelong disability and treatment has to be continuous. Early identification and management leads to considerable improvement in skills and better levels of functioning for children with ASD, as they become adults.

Management of children with ASD

The management of autism has undergone radical changes since it was identified. During 1950s etiological theories were parent centered and the management focused on psychotherapy with parents. When etiologic theories changed to biological based, the management techniques also underwent modification. Most widespread intervention measures are behavioral, developmental, educational, and biological. The approaches that are tailored for the needs of individual child and family are aimed at improving overall functional skills like communication, social interaction, and behaviors.

ASD are comparable to other neuropsychiatric disorders and are not curable and persistent management is necessitated. The management techniques reduce the behavioral symptoms and improve communication skills to varying degree. Even though the symptom reduces and skills improve, most of them continue to show these characteristics during adulthood. In the later life, they persist to experience problems in social relationships and communication. The major targets of management are to reduce the core symptoms and other features. These intervention approaches tackle the communication, social skills, play skills, and maladaptive behaviors.

Evidence based practice in ASD

The 20th century was considered as the era of efficient management techniques in communication disorders (ASHA, 2006). The literature shows different treatment approaches which varied in viewpoint, techniques, and results. Rogers (1998) was the one who completed efficacy of autism treatments in a systematic manner. Later few other studies

emerged. Goldstein (2002) had reviewed studies for evidence based practice in ASD and stated evidences for communication management techniques in ASD. Odom et al. (2003) provided conventional support for adult mediated/based reinforcement techniques for children with ASD.

Simpson and colleagues, (2005) grouped the treatment procedures for ASD under five categories namely 1) interpersonal relationship interventions and treatments, 2) skill-based interventions and treatments, 3) cognitive interventions and treatments, 4) physiological/ biological/ neurological interventions and treatments and 5) other interventions and treatments. Later these procedures were grouped again according to the custom as scientifically based, promising practice, practice and intervention not recommended.

a) Scientifically based techniques are the treatment approaches that have evidenced base and maintenance.
b) Promising practice are the ones that has effectiveness and value within ASD but that needs supplementary supports to consider that as scientific.
c) Practice is the one that has limited support and little or no scientific evidences.
d) Treatment that is not recommended is the ones that lack effectiveness and that can even cause damage to the individual.

Different management approaches for ASD

Behavioral management approaches

The main aim of the behavioral management program and approach is to establish and maintain a positive and appropriate pattern of behavior. The ABC analysis (i.e. antecedent and consequence analysis of behaviors) is the main component of behavioral management.

The behavior cannot always be directly changed, but we can affect the behavior by changing the antecedent and/or the consequence. Manipulating the antecedents and/or consequences increases acceptable behavior as well as reduces the inappropriate behavior (Brunner & Seung, 2009).

a) Applied Behavior Analysis (ABA)

ABA is based on operant conditioning and includes individual sessions to teach the acceptable behaviors and to change the undesired behaviors of the child. This method can be used to train an array of objectives like language, self-help and social skills (Brunner & Seung, 2009). ABA has good replication effects along with effectiveness. However, the criticisms for ABA methods are the time consumption, extensive use and the prompt dependency (Simpson, 2001) in children. Even after the conflicting statements, many researchers have reported ABA as evidence based practice for children with ASD. Many Speech Language Pathologists apply the principles of ABA in communication intervention of children with ASD both for initiating speech in previously nonverbal children, as well as for increasing the complexity of spoken language.

Few researchers addressed the effectiveness of ABA techniques in comparison with other methods and found that ABA techniques are one level higher than others in terms of the behavioral management aspects. One of the studies conducted by Eikeseth et al. (2002) evaluated the efficiency of ABA techniques with eclectic training techniques such as sensorimotor training and TEACH. The authors found significant improvements in IQ, language and adaptive skills for ABA group and they had IQs in the average range even after one-year follow up.

The study carried out by Stoelb et al. (2004) was a step forward in investigating association of ABA and the pretherapy conditions of ASD. They reported that the children with physical dysfunctions obtained reduced benefits from ABA. The regression condition was associated with reduced outcomes after a year post-test. Those children with a few quantities of linguistic skills prior to the treatment and without regression reacted to ABA in a better manner compared to the children with restricted language skills and regression.

Findings from the above studies are clinically applicable and help the clinicians to work with children with ASD. Overall, most of the researchers established evidences for ABA as a management technique for ASD. Examination of pretreatment characteristics of children with ASD may result in more appropriate decision making regarding treatment (Stoelb et al., 2004). While using ABA, main improvement is reported in terms of adaptive behaviors and language skills of the individual. However, the main question is that whether enhancement mirrors definite learning or prompt reliance. The usage of developmental method could actually enhance the prompt dependency in these children and improve the generalization skills.

b) Video Modeling

Video modeling is a part of behavioral intervention method. Current studies have reported that video education can be adapted to train multiple abilities in ASD. Several of the management techniques employ adults or peers as models for autistic children. Visual inclination in videos improves the concentration and attention of children with ASD. Models can be available in context or in whom the child is interested (Bellini & Akullian, 2007). The

review carried out by Odom et al. (2003) accepted video modeling as "probably efficacious" method for individuals with ASD. The studies also showed evidence for administration of video modeling with all age range children (Bellini & Akullian, 2007).

A meta-analysis carried out by Bellini et al (2007) investigated effectiveness of video modeling for ASD individuals. The authors examined around 23 case studies to establish the efficacy of video modeling. They stated that modeling is an efficient method for ASD. The limitation of this study is that the authors included very few studies that assessed only video modeling and most of them were combined approaches. Hence, additional research is necessary to validate the effectiveness of the technique. Although the clinical value of video modeling is questionable because of generalization problems, nevertheless, repeated video playback is offered with negligible effort and same videos may be used with other subjects.

Naturalistic behavioral approaches

These methods are capable to deal with the restraints of ABA. In general, these methods depend on behavioral guidance but administered in a more natural environment to motivate children with ASD (Brunner & Seung, 2009). The methods included under this technique are milieu teaching, functional communication training, and Pivotal Response Training (PRT).

a) Milieu Teaching

Milieu teaching is a natural paradigm intended to take advantage of children's needs and curiosity in ordinary atmospheres to implant training occasions. In milieu therapy, "the main aim is instructing the child's novel behaviors within the usual settings" (Kaiser, 1993). The natural environment could be home, school etc. (Schwartz, 2003). The milieu approach

comprises three elements: Incidental Teaching, Mand Model, and Time Delay. Different authors have reported numerous benefits in training communication skills in natural settings which include boost in vocabulary (Yoder et al., 1995), generalization (Hancock & Kaiser, 1996), maintenance (Spradlin & Siegel, 1982) and spontaneity (Yoder & Warren, 2002).

Enhanced milieu teaching (EMT) is an amalgam model merging methods from the interactive model and milieu teaching. Literature showed that EMT could improve skills of delayed language children comprising ASD (Hancock & Kaiser, 2002). The generalized effects of EMT across settings include increased child use of language targets, increased child frequency of communication, generalization across settings, people, and language concepts and maintenance of newly learned targets.

Kasari et al. (2006) compared the effectiveness of milieu teaching. They observed significant improvement in joint attention in the milieu teaching group along with quantitative increase in both joint attention initiation frequency and response during mother child interaction. The play targeted skills of these children were also improved. During mother child interaction, the authors also observed increased use of symbolic play. The authors concluded that in spite of taking therapy from early childhood most of the children in the other group did not show improvement in terms of joint attention and play skills.

b) Functional Communication Training (FCT)

In functional communication training the clinician, first targets the most difficult behaviors exhibited by these children. The clinician considers both frequency and nature of the behavior exhibited. The FCT initiates with the analysis of the challenging behaviors to determine the predisposing factors and later replacing that behavior with acceptable behavior

(Goldstein, 2002). The same method can be used by mothers at home in a more efficient way for improvement of child. Most of the available studies on FCT are restricted to case study.

Mancil and colleagues (2006) performed a case study to investigate effectiveness of FCT. An ASD child (4 years of age) with aggressive, challenging behaviors and limited language skills was the subject of the study. The authors trained the child using FCT using preferred activities. They reported that the child with ASD was able to reduce the challenging behaviors along with drastic improvement in vocabulary. The child was able to use 50 words and initiation of two word utterances was also observed. Apart from this, authors also reported generalization of the same skill by the child in different situations and with different persons.

c) Pivotal Response Training (PRT)

In PRT, child's enthusiasm in normal condition is considered for the development as that of other two natural behavioral methods. Parental participation is the important constituent in this approach. PRT and ABA comparison studies illustrated that naturalistic methods gains enormous functional communication than other methods (Koegel et al., 1998).

Pierce & Schreibman (1995) employed peer-employed PRT for autistic children. Typically developing children (TDC) were trained to execute PRT strategies by mock-up, role playing, and instructing. Subsequent to training sessions, TDC without supervision executed the methods. The environment was classroom and the children with ASD were able to maintain extended communication and began play with TDC. The class teachers also informed improvement in general manners during class time. The generalization and maintenance of the behaviors were observed.

Whalen and Schreibman (2003) administered PRT to teach joint attention to children with ASD. The main goal was to teach bids for demonstrating things. They results indicated affirmative improvements for all the five participants in terms of the reactions to the joint attention bids. Three of five children maintained these responses after 3-month post study. By the initial treatment session, few of the children showed improvement but the maintenance of the same was observed only in one child. The generalization of the targeted skills with investigator was consistent but mixed findings were observed with mothers. Response and initiation behaviors were generalized in these children in normal condition with the clinician. But, results obtained for generalization of these skills with mothers was baffling. Other finding was the significant improvement observed during child's play time.

All the above mentioned studies hold up the importance of EMT, FCT and PRT in training different skills to children with autism. Both pre-linguistic and linguistic skills could be targeted by means of these methods. However, most of the studies related to PRT are case studies and few studies have reported effectiveness of PRT in children with autism (Sherer & Schreibman, 2005). The natural behavioral methods can be administered in natural and clinical settings by training parents and clinicians.

Developmental approaches

The developmental methods are based on child developmental theories/hypothesis. Floortime techniques (Greenspan & Wieder, 2006), social communication, emotional regulation (Prizant, Wetherby, Rubin & Laurent, 2003) and Hanen approach (Sussman, 2002) are the few developmental methods. These methods presuppose that both verbal and nonverbal communication is developed by well-built, active adult–child contacts. Hence parental teaching and participation during therapy sessions are fundamental to these methods.

Developmental techniques vary from behavioral techniques in many ways. Primarily developmental techniques focus on social communication rather than on definite communication skills. In this method main aim is the communication where the clinician changes pre-intentional communication to intentional communication (Ingersoll, Dvortcsak, Whalen, & Sikora, 2005) in many different ways.

The case studies revealed that developmental interventions improve the communicative skills of young autistic children, especially nonverbal children (Ingersoll et al., 2005). The low-functioning autistic children may benefit from parent-based interventions. However, the behavioral methods are more beneficial for higher functioning children with autism (Stoelb et al. 2004).

Class Room Based Interventions

Apart from the above classified methods few authors also classified interventions designed to be utilized in the classroom. These are "Treatment and Education of Autistic and Related Communication-Handicapped Children (TEACCH) and Project Developmentally Appropriate Treatment for Autism (DATA)". All the previously addressed methods like ABA, EMT, PRT etc. were used to improve speech and language, communication and interaction in different settings. TEACCH is mainly used in the classroom setup. Many children with ASD have visual modality preference and TEACCH incorporates picture plans, and visual charts in which simple concrete steps are provided. By using augmentative and alternative approaches, functional communication is accentuated and with incidental teaching communication, skills are sustained (Mesibov, 1997). However major improvements in communication skills were not recognized with TEACCH method (Goldstein, 2002).

Panerai et al. (2002) reported TEACCH as an important management plan, and this method reduces self injurious behaviors and enhances the overall functioning of the child with ASD. The authors also stated that severe children with ASD demonstrated progress in imitation, perception, play, and daily living skills. Nevertheless, considerable enhancements in communication abilities were not reported, and that is constant with prior investigations.

Project DATA, is proposed entirely for young children with ASD. This approach incorporates both behavioral and developmental aspects. By this method children with ASD receive intensive intervention. One resource person will provide all the guidelines and support to family members. Current state of proof for classroom based methods is inadequate and tentative. Due to restrictions of the existing research, the effectiveness of these methods is difficult to establish these days.

Social Skills Interventions

The social interventions focus primarily on social and interaction skills. Studies have stated that social skill intervention improve specific social skills (e.g., initiations, responses), as well as general social functioning (McConnell, 2002; Rogers, 2000). A metanalysis study (Bellini, Peters, Benner, & Hopf, 2007) concluded that school-based social skills interventions may be only minimally effective for children with ASD.

a) Social Skills Training

Individuals with ASD lack social interaction or show impaired social interaction skills. Hence social skill training is aimed to improve these aspects and focuses on "conversation", "problem solving", "emotional awareness" and "regulation" (Barnhill, 2002). These skills are trained using modeling, cueing etc. Many authors had published standardized

curricula for these skill training and most of them are based on cognitive strategies. Many authors have supported the use of scripts in children with ASD.

One of the studies carried out by Charlop- Christy and Kelso (2003) supports this notion. The authors established scripts to train conversation skills to three school age children with ASD. They reported that all the subjects were capable to achieve the specified criteria and preserve the ability after fading the scripts. Generalization of these skills was reported to be fair after the administration of scripts. They concluded that this approach could be excellent one to use with children who prefer reading.

However, different authors obtained conflicting judgments. A review done by Simpson et al. (2005) stated that efficacy of scripts is restricted. Lopata et al. (2006) also recommended that cognitive dependent teaching is not satisfactory to show advancement in social abilities for ASD. These techniques have to be incorporate along with behavioral strategies for better advancement.

b) Social Scenarios

Children like to listen to stories and hence stories with social causes are very important to children with ASD. The stories can be directive, descriptive, perspective or affirmative. These can be used on daily basis and can be faded out once child achieves the targets. In review studies, few authors reported proof for administration of social stories to diminish harmful behaviors and encourage other functions in ASD (Ali & Frederickson, 2006; Sansosti et al. 2004). However, studies showed inadequate findings because of methodological limitations. The authors also recommended the necessity to examine generalization and maintenance skills using these methods.

Sansosti and Powell-Smith (2006) aimed to investigate the effect of social stories in individuals with Asperger syndrome. They observed enhancement in social engagement in two subjects, without maintenance of skills after 2-week of the study. Similarly, Scattone et al. (2006) carried out a study in which the authors employed 'social stories' in children with ASD to train initiation and response skills. They also reported progress in two children while interacting with peers. On the other hand, generalization was not evident in these children.

All the social skill training methods are still in early developing stage and more studies have to be concentrated in India to establish evidence. It is always better to combine these techniques with behavioral techniques to improve the efficiency of the subjects with ASD. However support for social stories is restricted, without obvious maintenance skills.

Augmentative and Alternative Communication

Communication is the main process that helps individuals to exchange ideas and feelings. The communication process could accomplish through both verbal and nonverbal mode. In augmentative and alternative communication, the main aim is communication of the subject rather than linguistic development. Most of the children with restricted abilities benefit from this method and develops the functional skills. As we know, the children with ASD have visual preference and that can be easily adapted for their language stimulation process. AAC approaches include various alternatives like sign, pictures, gestures, and speech generating devices (SGD).

Many researchers have estimated the efficacy of different AAC systems to children and adults with ASD. In one of the study by Buffington et al. (1998), the authors revealed that these children could train to make use of actions to convey simple sentences to

accompany communication. The literature has reported efficacy of using SGDs to improve communication in individuals with restricted spoken output (Schepis et al., 1998). Yet the quantity of research in this area is limited and hence the support for the efficacy of this method is very restricted.

a) Picture Exchange Communication System (PECS)

PECS is a structured method proposed to train the children in using visual pictograms for communication. PECS follows behavioral strategy of response and reinforcement along with prompts. PECS has been considered as an augmentative and alternative method by few authors because of the use of picture cards. These children are trained to use pictures to convey their desires and to expand their vocabulary by replacing pictures with objects. This method is initiated with one card at a time and complexity increases as the child acquires that. Later the training with same sentence type in various settings is carried out.

The proponents believe that this method ultimately helps for the progress of verbal communication. The authors reported an improvement in few functional skills in these children (Schwartz, Garfinkle, & Bauer, 1998). Few authors had shown that, these children later acquire some quantity of verbal communication. PECS's administration also improves the expressive skills in few children as reported by few authors (Charlop-Christy et al., 2002). Yoder and Stone (2006) had reported significant support for PECS. They displayed a quantity of different verbal acts after PECS training, as compared with a milieu teaching.

b) Sign Language Training

Sign language has been effectively used for many years to train linguistic skills to autistic (Mirenda, 2003). In particular, literature has portrayed that 'total communication' has

produced more effective outcome in children with limited communication skills (Goldstein, 2002). The literature holds on the effectiveness of AAC strategies for autistic children. The practice of sign language has obtained well-built experimental facts from decades (Mirenda, 2003). Still comparison studies of sign language with other methods are relatively narrow, with varied results (Tincani, 2004).

The effectiveness of the AAC methods for nonverbal children with ASD are more evident from the literature (Yoder & Stone, 2006a). PECS and sign language training promote speech and language development in nonverbal children with ASD due to visual nature and functional use (Carbone et al., 2006; Yoder & Stone, 2006b).

The autism treatment studies in 1990's lack the empirical support for the effectiveness of different management techniques (Rogers, 1998). However, concrete evidence is now existing for the efficacy of several interventions, including ABA, milieu teaching, PRT, developmental, video modeling, and AAC. Conversely, classroom-based treatments and social skills interventions remain in an exploratory stage of investigation.

Parent's Role in Management

Parental participation is a crucial part of management of ASD. The process begins with conveying the diagnosis to the parents. Generally, all of them go through a period of exhaustive agony. Behavioral skill training provides the parent and family with the skill to manage and support their children's development. Parental education and empowerment is also essential in obtaining the important information about the child and for proper diagnosis and management. Managing family is an important part of intervention and that definitely should focus on the family members and the child's environment. During the early stages of

autism, literature considered parents as the causative agent and now we accept parents as primary factor in successful management. Helping the family and providing mental and physical strength is extremely significant part of overall intervention process.

Data indicates evidence for the parent/family based management techniques in children with ASD. Many studies reported that parent mediated therapy can enhance over all communication skills including the social skills in autistic children (McConachie & Diggle, 2007). Data indicates the necessity of parent and family education "as a successful technique for enhancing abilities of children" (Reichow & Volkmar, 2010).

Video Recording and Documentary Films

Videos serve many purposes hence are of educational importance. Educational videos can be a powerful tool for instructions. Video tapes are used increasingly as "data" for research purposes because of its importance (Erickson, 1982; 1986; 2006). These materials have significant importance in present time. In the commercial business of medium, quality of educational programming begins with the relevant ideas that developed through script writing. One of the first steps for creating a video project is the script writing.

A script is necessary whether a video project is a feature length motion picture, a short training video, or even an account of a family vacation. A script is a document that describes the video, which includes descriptions of the various shots and any dialogue/voice over. "A script is not loud as images; but it is the backbone of the video. A great video could be made only with a great script. Script writing incorporates components like: ability to think visually, writing complementary narration, camera techniques, effective communication of theme, and

understanding the medium capabilities and limitations. Available video expertise offers researchers with a powerful assistance: that is, recordings and permanent storage for examination and reanalysis by various researchers.

Importance of Video Recording and Documentary Films for Assessment and Management of Communication Disorders

Videos and documentary films aid in enhancing our knowledge and learning process. These videos can be used for both professional and parent training program. The video manual has several roles such as educating the parents and public, training the students and professionals, simplifying the complex concept into simpler form and for systematic assessment and management of different disorders in speech, language, and hearing field. A script also serves as a planning device for the video. It describes the stock footage that is used, which locations certain scenes will be shot, what occurs in each shot, and what is included in each shot.

Video recording and Documentary Film studies in Indian context

Few Indian studies have used audio and/or video scripting for assessment and management of different communication disorders. Ritu and Shailaja (1993) developed audio- visual counseling for hearing impaired. The script was developed as a guide to audiologists to provide effective counseling to individuals with hearing impairment. This included information regarding audiological findings, hearing loss, communication needs, solution for hearing loss, and financial support etc. Sidheswar Prasad and Shailaja (1993) developed an audio- video presentation on speech reading script. The audio video materials were useful for the students of speech and hearing field and the individuals with hearing impairments.

The management of children with ASD is very important and challenging. India being a country with diversity in all aspects (culture, language etc.) expands the challenges for management of ASD. Anna Shan (2002) developed resource manual of intervention guidelines for ASD. This manual gave clinician an idea about the baseline assessment and different management techniques and methods and systematic way for administration of these techniques. The different goals and the activities for particular baseline assessment documents were mentioned in systematic manner. This manual helped the clinician to maximize the potential in helping the ASD child to communicate in daily environment.

Further studies have highlighted the role of video recording in ASD population for better comprehension of this population. Shilpashri and Shyamala (2011) had investigated pragmatic development in children with autism using video recordings of mother- child interaction. The subjects were 108 mother-child pairs, where in 72 were typically developing children (age range of birth to six years) and 36 were chronological, and social age matched children with ASD. The aim of the study was to identify the child's ability in responding to pragmatic skills initiated by communication partner and child's ability in initiating pragmatic skills during interaction with mother. Mother-child interactions were recorded for about one hour. Frequency of both initiation of pragmatic behavior by child and response to mother's initiation of pragmatic behavior were calculated.

The results showed that by 5-6 years of age all the pragmatic skills were mastered by typically developing children. In typically developing children both emergence of pragmatic skills and response to mother's initiation of pragmatic skill increased with age, and gender differences were negligible. The children with ASD were deficient in pragmatic skills at all age levels. Among mother's initiated pragmatic behavior, response for labeling was the only

pragmatic behavior found to be mastered by children with ASD. Percentages of response from children with ASD on self initiation and to mother's initiation of pragmatic skills were not constant. They also found that, interaction of mothers was very significant for pragmatic development. They discussed the importance of video recording to analyze the subtle differences in the mother child interaction for the importance of assessment and management of communication disorders and parent counseling. They concluded that video recording is very significant to account for developmental aspects in children with ASD and parent training.

Neethu and Shyamala (2014) had used video recording to assess mother child interaction in autism. Mother-child interactions were video recorded for an hour and caregiver interactive and pragmatic functions were analyzed from 40 min video recording. The caregiver interactive parameters assessed were invitation to vocalize, self repetition and repair, imitation, expansion, yes/no reply, other reply, interrogatives, imperatives, accompaniment, informative, child controlled events, caregiver controlled events, people/object present, and non-immediate. Pragmatic parameters assessed were topic initiation, topic maintenance, request action/object, stylistic variation, and turn taking. Both qualitative and quantitative differences were seen in terms of both caregiver interactive parameters and pragmatic parameters assessed. Out of 19 parameters analyzed, invitation to vocalize, expansion, child-controlled events, caregiver-controlled events, non-immediate, topic maintenance, request object or action, stylistic variation, and turn taking were significantly different in the two groups.

They found that recording was significant to differentiate the mother child interaction in autism and typically developing children. The findings from the study indicate that

counseling and parent training during on various interventions for children with autism are very important. The parents play primary role in teaching language to their young children with autism. As the child learns, language parents must constantly change the complexity of utterances to help the child to learn advanced vocabulary.

Gopi Sankar, Goswami, Preethi and Honey (2011) developed audio-video database for the assessment of voice disorders. The study was carried out in two phases, in the first phase preparation of script board; video recording, preparation, and evaluation of pre-final video and preparation of final video were carried out. Three experienced SLPs rated the prefinal video using video feedback checklist. The suggestions provided by the SLPs were included in the final video. The second phase was carried out with the field testing of the prepared video in 57 first year graduate students of speech, language and hearing field. The field testing was carried out using video evaluation questionnaire containing 75 questions. Video evaluation was administered initially and later video was presented. The video evaluation questionnaire was provided to the students after video administration. The difference in scores in pre and post test was evaluated for each question.

The results revealed that student's performance increased after viewing the developed educational documentary video on assessment of voice disorders. The authors highlighted the importance of documentary videos for assessment and management of communication disorders. They concluded that, the developed educational documentary video on assessment of voice disorder is helpful in facilitating better understanding of concepts for undergraduate students. An improving trend in performance of participants is indicative that the developed video does have a strong foundation for training the professionals in the field of communication disorders.

Krishna and Prema (2014) developed a video based training module for the evaluation of pragmatic skills of typically developing 3-6 year old children. The primary objective of the study was to compare the parental and professional assessment of pragmatic skills of the typically developing children. The investigator collected video samples of nine mother-child dyadic interactions within the natural home environment and independent pragmatic skills were selected from the obtained videos. The video training module was developed using the independent video samples of the pragmatic skills. Twenty graduate Speech Language Pathologists were subjected to rate the pragmatic skills of nine children after they were trained using the developed video training module.

The results indicated high inter-judge reliability among the Speech Language Pathologists and agreement ranged from less than chance agreement to good agreement between the judges and each child's parent within the different pragmatic domains. Thus the results of the study indicated that among the selected ten domains, the Speech Language Pathologists were able to rate the 'Non-verbal communication skills', Interaction and conversation skills, and 'Role playing' more significantly by observing the video samples of mother-child interaction as compared to other selected domains. This emphasize the importance of video based assessment to improve the quality of assessment procedure in children, especially during the assessment of non-verbal communication skills, that could be missed out while assessing using only the standardized test materials.

There are different management techniques available for children with ASD. The literature shows empirical evidence for ABA, EMT, PRT, AAC, and developmental approaches. Social skill intervention and classroom based intervention approaches are still in the developing stage and need more empirical evidence. Parents play an important role in the

management of children with ASD. We should always explain parents about different strategies and include them in the regular therapy program for the obvious improvement of these children. Managing family is an important part of intervention and that definitely should focus on the family members and the child's environment.

Videos and documentary films aid in enhancing our knowledge and learning process. These videos can be used for both professional and parent training program. The video manual has several roles such as educating the parents and public, training the students and professionals.

Review of studies on management techniques for ASD and video scripting for assessment and management of communication disorders emphasize the importance of video module because of the heterogeneity of population and inconsistent findings in the literature. The number of children with ASD have increased drastically in the recent past whereas the number of qualified professionals available for the services is invariably very low. The use of different management techniques within professionals varies significantly in ASD. By considering thesefactors, the current study is proposed with the objective of developing and validating a video manual for different management techniques in ASD.

In the Indian context, there is a dearth of studies related to management of ASD population. There is limited literature focusing on the importance of training the clinicians and mothers about the different management techniques for ASD. Thus, management of ASD is really a challenging task for SLPs. Additionally, there are hardly any studies focused on documentary for management of ASD with case demonstrations. The video manual will train the parents and students to apply different management techniques with uniformity on

children with ASD. If mothers understand these methods, the robustness of home training improves. Considering these factors, the investigator highlighted the importance of appropriate orientation and training to the clinicians and mothers on management of ASD to improve the quality of services to ASD population in India. The literature review also highlighted the effectiveness of video based/scripted management module for ASD.

CHAPTER III

METHOD

The present study was aimed to develop and field test the developed video manual for different management techniques for Autism Spectrum Disorders. The study was carried out in two phases. Phase I included development of the video module. The phase II involved field-testing of the developed video manual.

Phase I: Development of the video module

Phase I included the following steps:

1. Preparation of script
2. Video Recording of different management techniques
3. Preparation of pre-final video module
4. Evaluation of pre-final video by Speech Language Pathologists (SLPs)Preparation of the final video

Preparation of script

In the current study, script was prepared for different management techniques in children with ASD. The content of the video module was explored from text books, journals and internet sources. The script included relevant themes like introduction to ASD, specific management techniques and components for children with ASD and case demonstrations (Appendix I). The introduction consists of power point presentation of definition, characteristics, and different management techniques for children with ASD. Later specific management techniques were included along with few case examples. The narration is provided for the power point presentation and case examples.

Method of administration and video recording

The study materials and videos of case demonstrations were provided to student clinicians for better understanding of different therapy techniques. The management techniques included were:

1. Applied Behaviour Analysis
2. Discrete Trial Training
3. Picture Exchange Communication System
4. Enhanced Milieu Teaching
5. Pivotal Response Training and
6. Treatment and Education of Autistic and related Communication Handicapped Children

An informed consent was obtained from parents of children with ASD for the video recordings by explaining the procedure of the video recording. The video recording was done by SLPs in a well lit therapy room during regular therapy sessions. The recording was done using Sony digital HD video camera (HDR-XR150E). Prior to the video recordings, three training sessions (45 min each) were provided to both client and clinician dyads. The video recordings of each management technique required approximately 30 minutes for each child with ASD. The current study was the preliminary study to develop video module for management techniques for ASD in Indian context.

Participants

The participants in the present study included children with mild autism and PDDNOS.

Inclusion Criteria: Children with mild and moderate Autism and PDDNOS with mild intellectual disability included for the study.

Exclusion Criteria: Children with ASD with visual and hearing impairment and moderate to

severe intellectual disability were excluded from the video recording.

Subject selection for the video recording helped to select goal and activity and to conserve time. These children were divided into three age groups: 2.0-5.11 years, 6.0-9.11 years, and 10.0- 13.11 years.

Preparation of pre-final video

The editing of the pre-final video was done using free video editing software (version 1.4.15.921:2014) and windows moviemaker (version 2.1: 2012). The audio- visual materials and the power point presentations were edited based on script board. The editing of the videos was carried out in several steps according to different sub headings like content of the presentation, audio, and video. The videos were edited and joined using moviemaker. In overall, seven videos were prepared, which included introduction and six different management techniques. The voice over portion or narration was recorded using Praat software in a sound recording studio. The narration was merged with the content wherever necessary in the pre-final video.

Evaluation of the pre-final video by SLPs

The pre-final video was evaluated by three experienced SLPs working in the field of ASD who had experience of at least five years in the field of ASD. A video feedback checklist was developed to evaluate the pre-final video by SLPs. The checklist was developed by reviewing books, journals, and internet sources. It consisted of 16 questions under two sub headings: content and presentation, and audio & video characteristics (Appendix II). The SLPs were asked to rate the seven videos on a scale of three, where in one, two, and three indicates poor, average and good respectively. Apart from these, the

checklist consists of three other section/questions, where in the SLPs had to rate the overall video module, and give their suggestions to improve the video module and the checklist.

Preparation of the final video

The editing of the pre-final video was done by incorporating the suggestions given by SLPs. The modifications were done at appropriate places of the video module which include editing and reducing the duration of the videos, eliminating few goals and activities, improving lighting of video and improving quality of audio characteristics of narration etc. Ultimately the final video module of different management techniques in children with ASD was ready to be presented to the participants to evaluate the validity of the developed video module.

The video module contained seven videos: The first video was an introduction video around 35 minutes, which included introduction, need of the study along with description of treatment techniques. Other six videos included case demonstrations of the ABA, DTT, PECS, EMT, PRT, and TEACCH. Each case demonstration videos lasted for about 30 minutes. The ABA and other behavior management techniques were administered under the guidelines of a Clinical Psychologist and the SLP carried out the procedure during session. The rationale and procedure of each technique were included in the introduction part of the different management techniques. The videos were prepared to educate and train the parents and students about the different management techniques in children with ASD.

Phase II: Field testing of the developed video module

The phase II included the following steps:

2. Selection of participants
3. Development of the video evaluation questionnaire

4. Procedure
5. Analysis

Selection of participants

The B.Sc. (Speech & Hearing) Interns and mothers of children with ASD were considered as the participants for the current study. 20 Speech & Hearing Interns (students) and 15 mothers of children with ASD participated in the study.

Development of the video evaluation questionnaire

A questionnaire was developed to evaluate the effectiveness of the video by assessing the performance of participants before and after viewing the video module (Appendix III). The questionnaire consisted of 40 true of false statements sub grouped into seven subheadings which include general statements, and six specific management techniques (ABA, DTT, PECS, EMT, PRT, TEACCH) for better understanding of participants. The questions were arranged from general to specific manner for better understanding. General statements included ten questions and each management technique included five questions each.

Procedure

An informed consent was taken from students and mothers of children with ASD by explaining the purpose and procedure of the study. The participants were divided into small groups for better administration of questionnaire and description of video manual. Each group consisted of five members and the pre-questionnaire and post questionnaire were administered in groups. The participants were seated comfortably in an evaluation room. In the pre-test, the participants were asked to write true or false for the questions. Twenty to twenty five minutes were provided to participants to do the same. The introduction video was

presented first followed by the case demonstration videos. Case demonstration of each management technique was shown to participants for about five to ten minutes duration. The participants were provided five minutes break between presentation of introduction and case demonstrations of different management techniques. The total time duration for the entire video presentation was about 1 hour. Explanations and clarifications were provided to mothers where ever required. After the entire video presentation the post questionnaires were provided to write true/false to check the effectiveness of the video manual. Fifteen to twenty minutes were provided to the participants to complete the questionnaire.

Scoring

After the administration of the video, pre and post questionnaires were evaluated by the SLP. Each correct answer was scored as 1 and each incorrect answer was scored as 0. Finally, total scores were also calculated for both questionnaires separately. Total scores were provided out of forty.

Analysis

The pre and post questionnaires were evaluated and the total scores were calculated for the data. The obtained data were tabulated and analyzed using Statistical Package for Social Sciences (SPSS Version 17). Inter judge reliability of the video feedback checklist was computed using Kappa coefficient (K). 'Paired sample t test' was employed to compare pre and post questionnaire scores within each groups. 'Independent sample t test' was carried out to compare pre and post questionnaire scores between two groups. The test for equality of proportions was carried out to compare percentage of correct response in two groups. The test for equality was computed using SSP Version 1.0. McNemar's test was used to find out the frequency of participants who changed their response from pre to post questionnaire condition and response proportions in participants in both pre and post questionnaire conditions. McNemar's test was computed using R software (Version 2.91).

CHAPTER IV

RESULTS AND DISCUSSION

The objectives of the study were to develop and validate video manual for different management techniques in children with ASD. The video manual was developed for students of speech and hearing discipline and mothers of children with ASD. A total of twenty students and fifteen mothers participated in the present study.

Three experienced judges using a video feedback checklist rated the content validity of the developed video module. Inter judge reliability of the video feedback checklist was computed using Kappa coefficient. The value of Kappa coefficient ranged from 0.65 to 0.90 (at 0.05 significance level) for all the questions in feedback checklist for all the seven videos developed and it signifies good agreement between the judges.

Test of Normality

Normality test was performed to determine the accurate statistical test for the data. Shapiro-Wilk test of normality was carried out for students and the value was 0.184 ($p>0.05$) for total pre questionnaire score and that of post questionnaire score was 0.180 ($p>0.05$). Shapiro-Wilk test of normality value in mothers was 0.141 ($p>0.05$) for total pre questionnaire score and that of post questionnaire scores was 0.263 ($p>0.05$). In students and mothers the p value of normality test was >0.05 for both total pre questionnaire score and total post questionnaire score, and indicated normal distribution of the data.

The results of the study are discussed under the following sub headings:

a) Comparing pre and post questionnaire score within students
b) Comparing pre and post questionnaire score within mothers
c) Comparing pre and post questionnaire score between students and mothers
d) Comparing correct response between students and mothers in post questionnaire condition
e) Comparison of response proportion in pre and post questionnaire condition for students and mothers

a) Comparing pre and post questionnaire score within students

The descriptive statistics for pre and post questionnaire responses in students were obtained. Table 1 and Figure 1 shows mean and SD of pre and post questionnaire scores for students in tabular and graphical form respectively. In students the mean of total pre questionnaire score was 22.80 with a SD of 4.84. The range was 15 with a minimum score of 15 and a maximum score of 30. The mean of total post questionnaire score was 32.70 with SD of 2.41. The range was 8 with a minimum and maximum score of 28 and 36 respectively. After the administration of the video, post questionnaire mean score has improved to 32.70 and the SD reduced to 2.41. Paired sample t test was carried out to compare pre and post questionnaire scores in students.

Table 1: *Mean and SD of pre and post questionnaire scores in Students*

	Pre Questionnaire	Post Questionnaire
Mean	22.80	32.70
SD	4.84	2.41

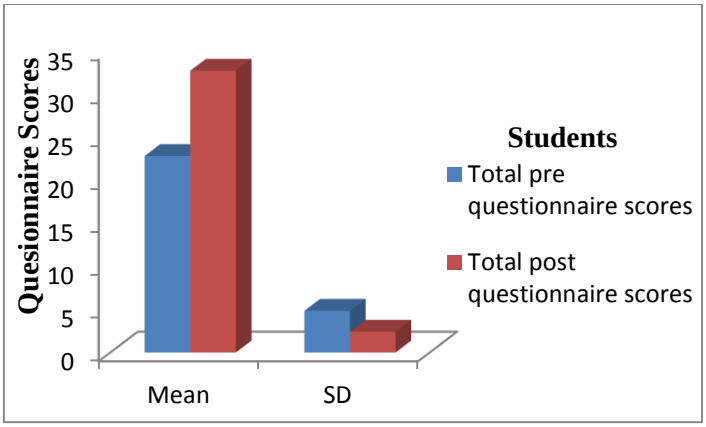

Figure 1: *Comparison of Mean score and SD in pre and post questionnaire conditions for students*

The results indicated a significant difference between pre and post questionnaire scores within students ($t(19) = 11.00$, $p<0.01$).The figure1 indicates significant improvement in scores from pre questionnaire to post questionnaire condition. Overall, it was found that in pres questionnaire students attained a lowest score of 15 and a highest score of 30 out of 40. In the post questionnaire students attained a lowest score of 28 and a highest score of 36 out of 40. Only two students scored less than thirty in post questionnaire condition. The results depicts that the developed video module was useful for the students of speech and hearing profession. The video module enhanced their learning and improved their knowledge in the area of management of children with ASD.

In pre questionnaire, the students answered most of the general questions (Q8-The children with Autism Spectrum Disorders respond equally to all management techniques. Q9-The specific characteristics in Autism Spectrum Disorders differ in terms of quantity and quality etc.). Even though the questions were sub grouped into different management techniques independent analysis was not carried out. From the scores it was evident that most of the students attempted to answer and score more in ABA, EMT and PECS questions compared to others in the pre questionnaire. But in the post questionnaire the students attempted to answer the entire questionnaire and their scores improved for the other

management techniques like PRT and TEACCH. Hence it can be concluded that before the video administration students had limited knowledge about different management techniques and after viewing the video their concepts and knowledge improved.

b) Comparing pre and post questionnaire score within mothers

In mothers, the mean of total pre questionnaire score was 14.27 with a SD of 4.23. The range was 14 with a minimum score of 8 and a maximum score of 22. The mean of total post questionnaire score was 30.13 with a SD of 1.77. The range was 6 with a minimum and maximum score of 28 and 34 respectively. Table 2 and Figure 2 depicts mean and SD of pre and post questionnaire scores in mothers in tabular and graphical form respectively. After the administration of the video, post questionnaire mean score improved to 30.13 and the SD reduced to 1.77.

Table 2: *Mean and SD of pre and post questionnaire scores in Mothers*

	Pre Questionnaire	Post Questionnaire
Mean	14.27	30.13
SD	4.23	1.77

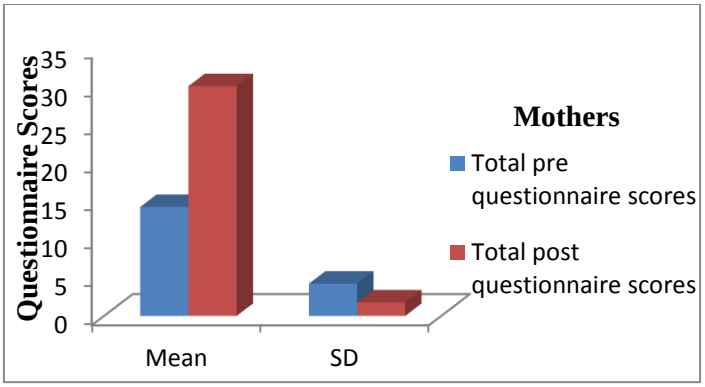

Figure 2: *Comparison of Mean score and SD in pre and post questionnaire conditions for mothers.*

Paired sample t test was carried out to compare pre and post questionnaire scores in mothers. The results indicated a significant difference between pre and post questionnaire scores within mothers ($t(14) = 14.55$, $p<0.01$). Overall, it was found that in pre questionnaire mothers attained a lowest score of 8 and a highest score of 22 out of 40. In the post questionnaire mothers attained a lowest score of 28 and a highest score of 33 out of 40. The results depicts that the developed video module was useful for the mothers of speech and hearing profession. The video module enhanced their knowledge about management of children with ASD. During video administration few terms were explained to mothers for better understanding. During video presentation, occasionally mothers have asked for explanation of the content. The explanations during videos would have helped the mothers to attain good scores in the post questionnaire conditions.

In pre questionnaire the mothers answered more of the general questions (Q3-Children with Autism Spectrum Disorders show poor listening and speaking skills, Q4-A child with Autism Spectrum Disorder does not need intensive teaching session.etc.) as compared to different management techniques. In the pre questionnaire most of the mothers answered only introduction and ABA. But in the post questionnaire they attempted to answer the entire questionnaire and improved their scores for different management techniques. Hence it could be concluded that before the video administration mothers knew only general

traits in ASD but after viewing the video their knowledge of specific management techniques improved.

c) Comparing pre and post questionnaire score between students and mothers

The total pre questionnaire mean score was 22.80 in students and that of mothers was 14. 27. Total post questionnaire mean score was 32.70 and 30.13 in students and mothers respectively. The figure 3 shows the comparison of total pre and post questionnaire mean scores between students and mothers. It is evident that both pre and post questionnaire mean scores were higher in students as compared to mothers.

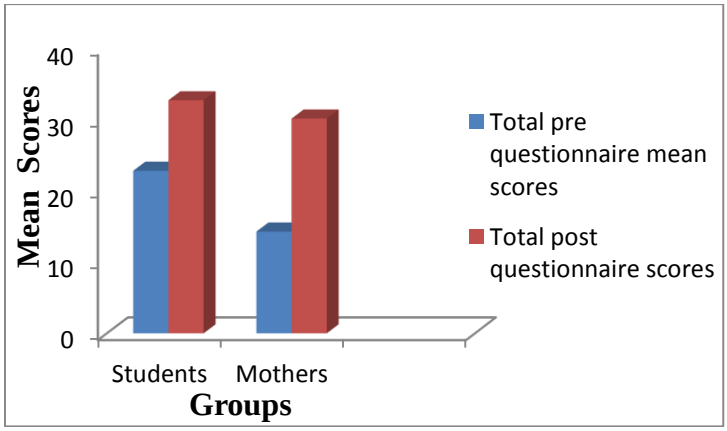

Figure 3: *Comparison of total pre and post questionnaire mean score between groups.*

To compare pre and post questionnaire scores between students and mothers independent sample t test was applied. For the total pre questionnaire score in both groups, Levene's test of equality of variance indicates f value at $p>0.05$ ($f=.849$, $p>0.05$) and hence homogeneity of variance was assumed. The independent sample t test for equality of means indicates significant difference between two groups in terms of total pre questionnaire scores ($t(33)=5.44$, $p<0.01$). Levene's test of equality of variance for total post questionnaire in both groups obtained f value of 2.59, $p>0.05$ and hence homogeneity of variance was assumed. The t test for equality of means indicates significant difference between two groups in terms of total post questionnaire scores ($t(33)=3.48$, $p<0.01$).

In the pre questionnaire, students obtained higher scores than mothers and this could be justified based on the fact that, students have more opportunities to learn about different management techniques for ASD during their course work. Hence students would be at advantage to grasp and understand the concepts in the developed video module. But in mothers, their knowledge of different terminologies and concepts regarding management techniques would be very vague and general as compared to students. The difference seen in the total post questionnaire scores could also be attributed to the same reason. Student's scores were better in post questionnaire condition as the video module helped the students to clarify their doubts and to improve their basic knowledge about different management techniques demonstrated in the video module. But at the same time for mothers who viewed the video module, it provided new information regarding different management techniques and they required repeated practice with the video module to improve their concepts. The video module helped the mothers to improve their knowledge in general about the management techniques in ASD and helped them to be familiar with the different management techniques.

d) Comparing correct response between students and mothers in post questionnaire condition

Test for equality of proportions was administered to find out the number and percentage of correct responses in both groups in the post questionnaire condition. Test of equality was computed using SSP software (version 1.0). Test of equality of proportion revealed that correct response of students and mothers was significantly different for six out of forty questions in the post questionnaire condition.

Table 3: *Comparison of number and percentage of correct responses in two groups for significantly different questions in post questionnaire condition*

Question Numbers	No of Students and Percentage (%)	No of Mothers and Percentage (%)	Z value	P value
1	16 (80)	4 (26.7)	3.16**	0.001
14	16 (80)	8 (53.3)	1.99 *	0.045
19	18 (90)	3 (20)	4.18**	0.000
23	18 (90)	8 (53.3)	2.46*	0.014
29	18 (90)	6 (40)	3.15**	0.001
40	11 (55)	3 (20)	2.09*	0.036

* indicates observed difference is significant at 0.05 level of significance

** indicates observed difference is significant at 0.01 level of significance

Question No 1, 19 & 29

In the post questionnaire, sixteen students (80%) and four mothers (26.7%) obtained correct score for question no 1(The difficulties in communication, social interaction and poor mental abilities are the triad of symptoms in Autism Spectrum Disorders). The number of correct response in the post questionnaire for question no 1 between the two groups was significant ($Z= 3.16$, $p<0.01$). In the post questionnaire, eighteen students (90%) and three mothers (20%) obtained correct score for question no 19 (Negative reinforcement decreases the behavior on providing the desired item). The number of correct response in post questionnaire for question no 19 between two groups was significant ($Z= 4.18$, $p<0.01$). In the post questionnaire, 18 students (90%) and six mothers (40%) obtained correct score for question no 29 (Mand model consist of a question followed by a pause). The number of correct response in post questionnaire for question no 29 between two groups was significant ($Z=3.15$, $p<0.01$).

The significant differences in correct response percentage for question no 1 between students and mothers could be justified by the reason that the triad of symptoms in ASD is a very basic concept and most of the students knew this through their theoretical and practical course work. The video module helped them to refresh their knowledge and avoid confusions. However in mothers most of them were unaware of the term repetitive and restricted behaviors and thought poor mental abilities as one of the triads of symptom. The significant differences in correct response percentage for question no 19 between students and mothers could be attributed to the reason that, mothers would have confused between positive and negative reinforcements and the rephrasing of the question. The demonstration and definitions provided in the module helped the students to attain correct response for question no 19. The significant differences in correct response percentage for question no 29 between students and mothers could be because of student's familiarity of the term Mand Model and the video have helped them to enhance the knowledge about the Mand model technique within EMT. However most of the mothers were exposed to the term Mand Model for the first time and it will take some time to register the concept and learn the definition of the new term learned.

Question No 14, 23 & 40

In the post questionnaire, sixteen students (80%) and eight mothers (53.3%) obtained correct score for question no 14 (Mass trial includes presentation of combination of related and unrelated tasks). The number of correct response in post questionnaire for question no 14 between two groups was significant ($Z=1.99$, $p<0.05$). In the post questionnaire, eighteen students (90%) and eight mothers (53.3%) obtained correct score for question no 23(PECS is not beneficial for verbal children with Autism Spectrum Disorders). The number of correct response in post questionnaire for question no 23 between two groups was significant ($Z=2.46$, $p<0.05$). In the post questionnaire, eleven students (55%) and three mothers (20%)

obtained correct score for question no 40 (Work system includes physical arrangement of different areas). The number of correct response in post questionnaire for question no. 40 between the two groups was significant ($Z=2.09$, $p<0.05$).

The question no. 14 was regarding DTT and the question was confusing hence students scored high percentage than mothers in the post questionnaire. Question no. 23 was regarding PECS and most of the mothers thought that PECS is useful for only verbal children and they scored less compared to students in post questionnaire condition. Question no. 40 was regarding TEACCH and the mothers would have confused about the different terminologies and scored less compared to students in post questionnaire condition.

Question No 2- 8, 13, 15, 17, 20, 22, 25-28, 30-35, 37

In all these questions the difference in correct response for the post questionnaires was seen between groups but the difference was not significant. Hence the number of correct response for post questionnaire between students and mothers was not significant for all these questions. The question nos. 2-8 (3.Children with Autism Spectrum Disorders show poor listening and speaking skills, 4. A child with Autism Spectrum Disorder does not need intensive teaching session, and 5.The management techniques for other communication disorders can be adapted for the management of Autism Spectrum Disorders) were regarding the general information in ASD and, both students and mothers obtained almost similar correct percentage scores for all these questions. After viewing the video module mothers acquired base knowledge regarding the characteristic features and this helped them to improve the post questionnaire scores. Students maintained their correct response for few questions and improved scores for questions after viewing the video module.

Question no 13, 15, 17, and 20 were regarding DTT and ABA and both students and mothers had obtained similar correct percentage scores in post questionnaire as these two techniques were almost similar and were easy for both groups and they learned few concepts of these techniques from the video module. The question no 22, 25-28 were from PECS and EMT and the concept were easy and the video module helped them to improve their correct percentage in post questionnaire conditions and the trend was similar in both groups. The question no 30-35 were from PRT and the concept were new for both groups. The correct percentage in post questionnaire conditions for these questions was similar in both groups.

Question No 9- 12, 16, 18, 21, 24, 36, 38-39

In all these questions all the students (100%) and mothers (100%) obtained correct scores and hence Z value could not be obtained. The correct response percentage was 100% in both groups for all these specified questions in post questionnaire condition. The results revealed that the video module was helpful in improving their knowledge regarding the concepts related to all these questions.

In general, the percentage of correct response in students ranged from 15 % to 100%. Three students provided correct answer for the question no. 37 (Physical organization is the arrangement of activities for each session) and obtained 15% and all the students obtained correct scores for few questions like 9 (The specific characteristics in Autism Spectrum Disorders differ in terms of quantity and quality), 12 (Constant instructions should be used in initial stages of DTT), 16 (Antecedent Behavior and Consequence (ABC) is a term used in Applied Behavior Analysis) etc. and achieved 100% in post questionnaire condition. In mothers the percentage of correct response ranged from 6.7% to 100%, where in only one mother provided correct answer for the question no 37 and obtained 6.7 % and all the

mothers obtained correct scores for questions like *9,12, 16* etc and achieved 100% in post questionnaire condition.

The correct response scores indicates that two groups differed only in terms of six questions and for all other questions the correct response scores were similar in two groups. The difference seen in both the groups could be due to the knowledge gained by students through theoretical course work. Correct response scores and percentage in post questionnaire show that the developed video module was relatively equally helpful for the students of speech and hearing profession and mothers of children with ASD and the video module enhanced their knowledge regarding different management techniques for children with ASD.

e) **Comparison of response proportion in pre and post questionnaire condition for students and mothers**

To establish the effectiveness of the developed video manual response proportion analysis was carried out. Cross tabs for the participant's response was obtained using SPSS and McNemar's test was done using R software. The number of participants who moved from correct response to incorrect response and vice versa was established by cross tabs. The first observation was improvement in participant's performance from pre to post questionnaire (i.e. pre incorrect to post correct response) on various questions in video evaluation questionnaire. Second observation was movement of participants from pre correct to post incorrect. However this tendency was negligible as only six out of thirty five participants (17%) exhibited the trend. Out of the six participants three of them exhibited the trend only for one question. Hence, the data obtained could be considered as a consistent data. Third observation was same response in both pre and post questionnaire conditions (i.e. pre and post correct or pre and post incorrect response).

Response Proportion analysis in Students

In students the McNemar's test indicated significant change from pre to post questionnaire condition in eighteen questions out of forty questions. Reponses in remaining question has also changed from pre questionnaire to post questionnaire, but the transformations were not significant. The response proportion analysis for each question is discussed in the following section.

Question no 1, 5, 8 & 16

Three students (15%) provided incorrect response and sixteen students (80%) provided correct response in both pre and post questionnaire conditions for question no 1 (The difficulties in communication, social interaction and poor mental abilities are the triad of symptoms in Autism Spectrum Disorders). One student changed the response from correct to incorrect from pre questionnaire to post questionnaire condition for the same question. In question no 5 (The management techniques for other communication disorders can be adapted for the management of Autism Spectrum Disorders); eight students (40%) provided incorrect response and nine students (45%) provided correct response in both pre and post questionnaire conditions. One student (5%) changed the response from correct to incorrect and two of them (10%) moved from incorrect to correct response from pre to post questionnaire condition for the same question. In question no 8 (The children with Autism Spectrum Disorders respond equally to all management techniques), seventeen students (85%) provided correct answer in both the conditions and two students (10%) changed the response from correct to incorrect and one student (5%) moved from incorrect to correct response from pre to post questionnaire condition. In question no 16(Antecedent Behavior and Consequence is a term used in Applied Behavior Analysis), nineteen students (95%)

provided correct response in both pre and post questionnaire conditions and one student (5%) moved from incorrect response to correct response from pre to post questionnaire.

Hence, in all these questions the change from pre questionnaire to post questionnaire condition was not evident and the change in response proportions were not significant ($\chi^2=0, df = 1, p>0.05$). All these questions except 16 were regarding general characteristics in ASD and students knew the basic information and hence, difference in response proportions were not evident from pre to post questionnaire condition. The question no 16, related to ABC analysis in ABA is also a common term used in behavioral approach. As students already knew these concepts the improvement could not be seen after administration of video module.

Question no 2, 32 & 36

The performance of students improved after viewing the video module as six out of twenty (30%) students moved from incorrect response to correct response for these questions. In question no 2, six students (30%) provided incorrect response and eight students (40%) respond correctly in both pre and post questionnaire conditions. Figure 4 shows percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 2 (All the management techniques of Autism Spectrum Disorders are based on behavioral principles)

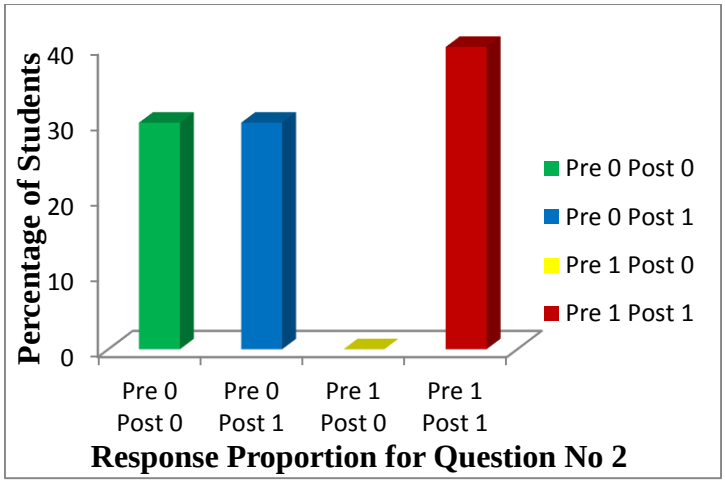

Figure 4: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 2.*

In question no 32 (PRT starts with neutral items and move on to preferred items), ten students (50%) provided incorrect response in both pre and post conditions and four (20%) provide correct response in both conditions. Figure 5 shows percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 32.

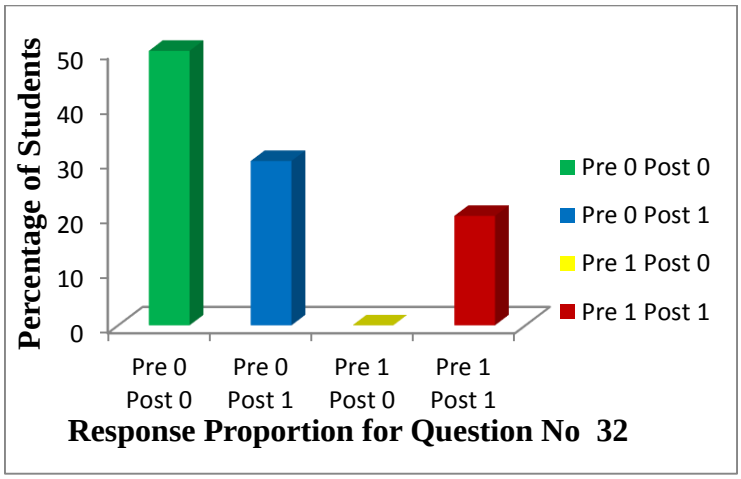

Figure 5: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 32.*

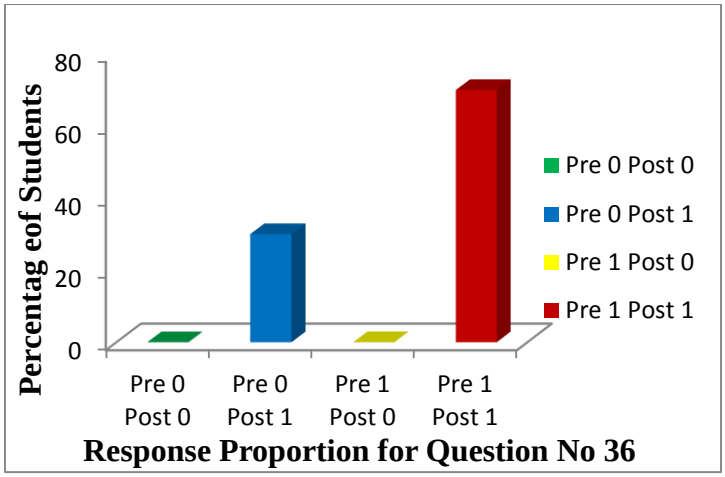

Figure 6: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 36.*

Figure 6 shows percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 36 (TEACCH is an educational intervention technique for children with ASD). In question no 36, fourteen students (70%) respond correctly in both pre and post questionnaire conditions. The results indicated a significant improvement (χ^2=4.16, df = 1, p<0.05) from pre to post questionnaire for question no 2, 32 & 36 in students.

Most of the students obtained correct response in both the conditions for question no 2 & 36 and the result indicates that the video module helped these children to sustain and refresh the learned concept. Few students obtained improvement in scores in post questionnaire condition and the result indicates that, the video module helped these children to improve their knowledge regarding different management approach for ASD. In question no 32, most of the children obtained the incorrect response in both the conditions and this could be due to unfamiliarity of the technique and confusions in the terminologies. Few students obtained improvement in scores and this reveals the importance and usefulness of video module in student education.

Question no 3, 6, 31 & 39

Figure 7 shows percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 3 (Children with Autism Spectrum Disorders show poor listening and speaking skills) & 6 (Autism Spectrum Disorders is also known as Pervasive Developmental Disorders). The performance of students improved after viewing the video module as eight out of twenty (40%) students moved from incorrect response to correct response. One student (5%) provided incorrect response and eleven students (55%) provided correct response in both the conditions.

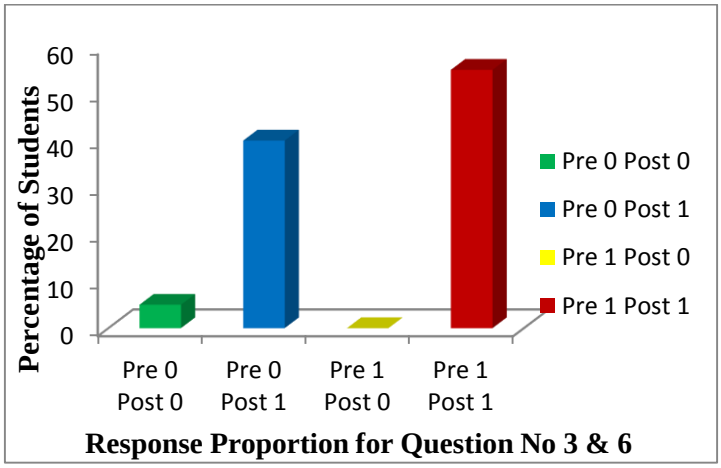

Figure 7: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 3& 6.*

Figure 8 shows percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 31 (PRT targets only one behavior at a time in children with Autism Spectrum Disorder). The performance of students improved after viewing the video module as eight out of twenty (40%) students moved from incorrect response to correct response. But, nine students (45%) provided incorrect response and three children (15%) provided correct response in both pre and post questionnaire condition. Figure 9 shows percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 39 (Schedules include the sequence of activity list with respect to time). The performance of students improved after viewing the video module

as eight out of twenty (40%) students moved from incorrect response to correct response. Twelve students provided (60%) correct response in both pre and post questionnaire condition. Hence, the results indicated a significant improvement (χ^2=6.125, df = 1, p<0.05) from pre to post questionnaire for all these questions in students.

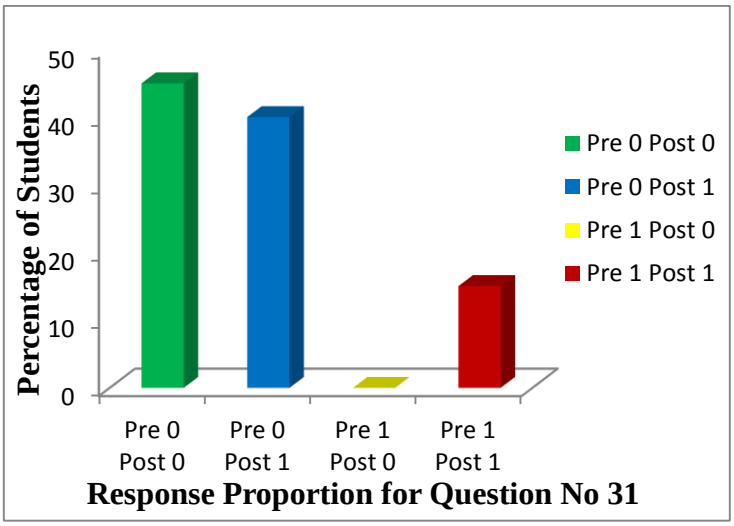

Figure 8: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 31.*

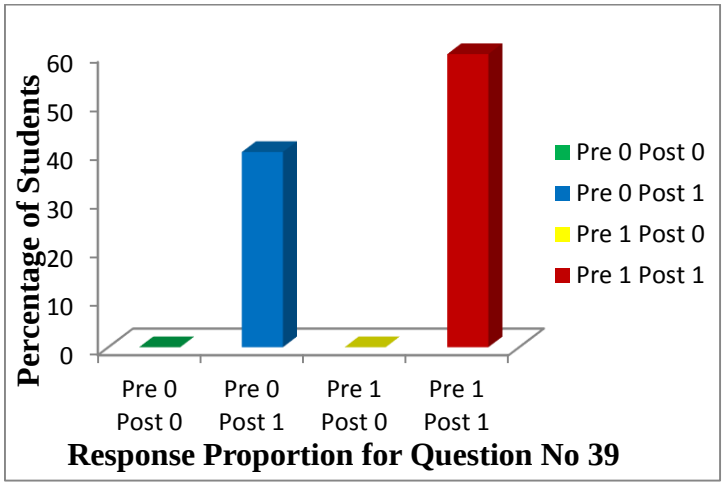

Figure 9: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 39.*

Most of the students obtained correct response in both the conditions for question no 3, 6 & 39 and the result indicates that the video module helped these children to sustain and refresh the learned concept. Few students obtained improvement in scores in post questionnaire condition and the result indicates that, the video module helped these children to improve their knowledge regarding few terminologies and techniques in different management approach for ASD. In question no 31, few children obtained the incorrect response in both the conditions and this could be due to unfamiliarity of the technique (PRT) and confusions in the terms. Few students obtained improvement in scores and this reveals the importance and usefulness of video module in student education.

Question no 4, 13, 18, 27, & 37

Three students (15%) moved from incorrect response to correct response from pre to post questionnaire and fifteen students (75%) provided correct response and one student (5%) provided incorrect response in both pre and post questionnaire conditions for question no 4 (A child with Autism Spectrum Disorder does not need intensive teaching session). One student changed (5%) the response from correct to incorrect from pre questionnaire to post questionnaire condition for the same question. In question no 37 (Physical organization is the arrangement of activities for each session), sixteen students (80%) provided incorrect response and one student (5%) provided correct response in both the conditions. Only three students (15%) changed the response from incorrect to correct from pre to post questionnaire condition. Three students (15%) moved from incorrect response to correct response from pre to post questionnaire and seventeen students (85%) provided correct response in both pre and post questionnaire conditions for question no 13, 18 & 27. The change in response from pre questionnaire to post questionnaire conditions were not evidently seen and hence, the

response transformations were not significant (χ^2=.25, df = 1, p>0.05) for all these questions.

All these questions were easy and students knew the fundamental information and hence, differences in response proportions were not evident from pre to post questionnaire condition. The students achieved the fundamental information through theoretical course work of graduation. Since students already knew these concepts the improvement could not be seen after administration of video module.

Question no 7

Figure 10 shows proportions of students providing correct and incorrect response on pre and post questionnaire conditions for question no 7 (Class room based approach is a treatment approach for children with Autism Spectrum Disorders). The performance of students improved after viewing the video module as thirteen out of twenty (65 %) of the students moved from incorrect response to correct response. Seven students (35%) responded similarly in both conditions.

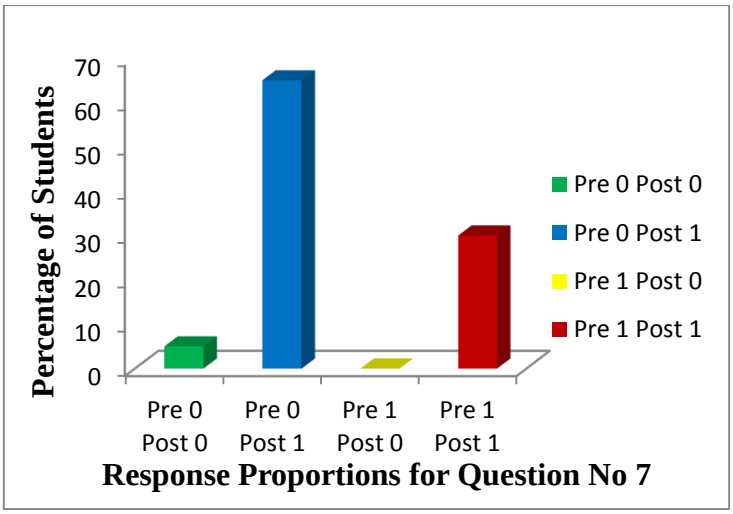

Figure 10: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 7.*

The results indicated a significant improvement ($\chi^2 = 0.25, df = 1, p<0.01$) from pre to post questionnaire for question no 7 in students. Most of the students obtained correct response in post questionnaire and result indicates that the video module helped these students to improve their concept of TEACCH as an educational intervention approach to ASD. Before the video the students were unaware about usefulness of TEACCH and hence the developed video module is facilitative in enhancing knowledge of different management techniques for ASD.

Question no 11, 15, 17, 21, 24, & 25

Four students (20%) moved from incorrect response to correct response and sixteen students (80%) provided correct response in both the questionnaire conditions for question no 11 (DTT breaks down learning units into simple units), 21 (PECS is a behavioral technique, in which communication is carried out through picture exchange), & 24 (PECS improves requesting, answering, and commenting skills in children with Autism Spectrum Disorders). In question no 17 (Antecedence increases or decreases the frequency of behavior) & 25 (Discrimination activities start with equally preferred items), thirteen students (65%) provided incorrect response and three students (15%) provided correct response in both the conditions. Four students (20%) changed the response from incorrect to correct from pre to post questionnaire conditions in question no 17 & 25. In question no 15, seven students (35%) provided incorrect response and nine students (45%) provided correct response in both the conditions and four students (20%) changed their response from incorrect to correct response. The change in response from pre questionnaire to post questionnaire condition was not evidently seen and the transformation of responses were not significant ($\chi^2 = 2.25, df = 1, p>0.05$) for these questions.

The change in response proportions was present in few children. All these questions were easy and students knew the fundamental information and hence, differences in response proportions were not evident from pre to post questionnaire condition. The students achieved the fundamental information through theoretical course work during graduation. Since students already knew these concepts the improvement could not be seen after administration of video module. The video module would have helped the children to maintain their knowledge regarding these concepts.

Question no 12

Two students (10%) moved from incorrect response to correct response from pre to post questionnaire for question no 12 (Constant instructions should be used in initial stages of DTT). Eighteen students (90%) provided correct response in both pre and post questionnaire conditions. The change in response from pre questionnaire to post questionnaire condition was not evidently seen and the transformation of responses were not significant ($\chi^2 = 0.5, df = 1, p > 0.05$) for this question. The students knew the concept of using constant instructions at initial stages of therapy. Hence improvement could not be seen after administration of video module. The video module would have helped the children to maintain their knowledge regarding the concept.

Question no 14

The performance of students improved after viewing the video module as seven out of twenty (35%) students moved from incorrect response to correct response. Four students (20%) provided incorrect response and nine students (45%) provided correct response in both the conditions. Figure 11 shows percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 14(Mass trial includes presentation of combination of related and unrelated tasks). The results indicated a significant

improvement (χ^2 =5.14, df = 1, p<0.05) from pre to post questionnaire for question no 14 in students.

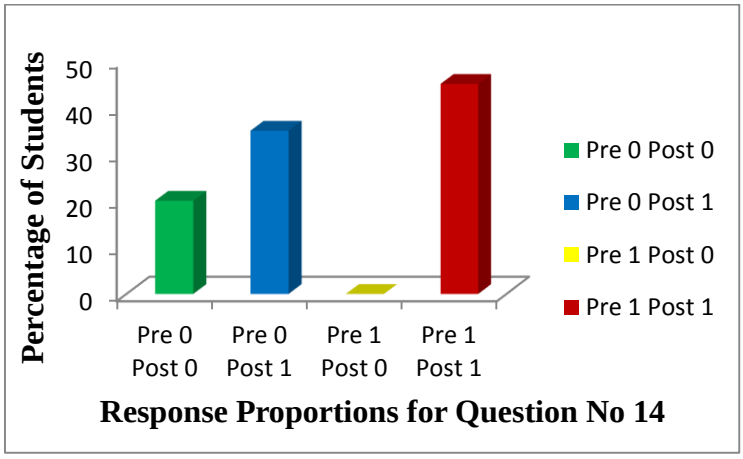

Figure 11: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 14.*

Most of the students obtained correct response in post questionnaire and result indicates that the video module helped these students to improve their concept of stimulus presentation in DTT. Before the video the students were unaware about mass trials in DTT. The video module also helped the students to refresh their knowledge about stimulus presentation in DTT.

Question no 19

Figure 12 shows proportions of students providing correct and incorrect response on pre and post questionnaire conditions for question no 19 (Negative reinforcement decreases the behavior on providing the desired item). The performance of students improved after viewing the video module as ten out of twenty (50 %) students moved from incorrect response to correct response. One student (5%) changed the response from correct to incorrect in post questionnaire condition. One student (5%) provided same incorrect response in both conditions and eight students (40%) provided correct response in both conditions. The

results indicated a significant improvement (χ^2=5.81, df = 1, p<0.05) from pre to post questionnaire for question no 19 in students.

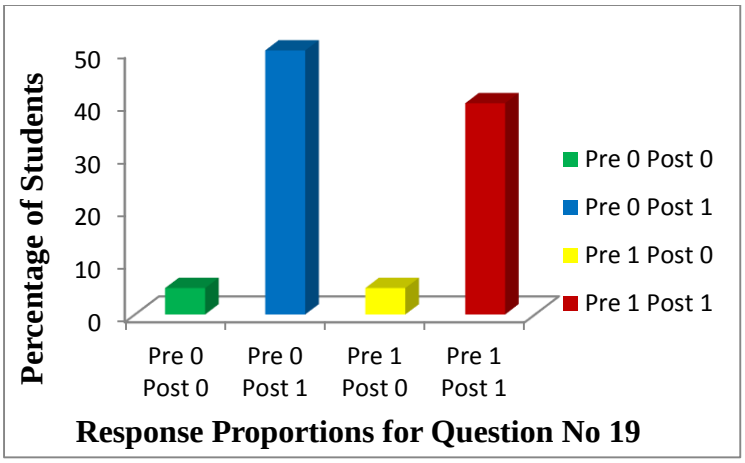

Figure 12: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 19.*

Most of the students obtained correct response in post questionnaire and result indicates that the video module helped these students to improve their concept of negative reinforcement in ABA. Before the video the students were confused between negative reinforcement and punishment. The video module also helped the students to refresh their knowledge about reinforcements in ABA.

Question no 20 & 30

Eight out of twenty (40%) students moved from incorrect response to correct response from pre to post questionnaire condition. Ten students (50%) provided correct response in both conditions. One student (5%) provided incorrect response in both conditions and another one (5%) changed the response from correct to incorrect. Figure13 shows proportions of students providing correct and incorrect response on pre and post questionnaire conditions for question no 20 (The generalization is not a part of ABA program).

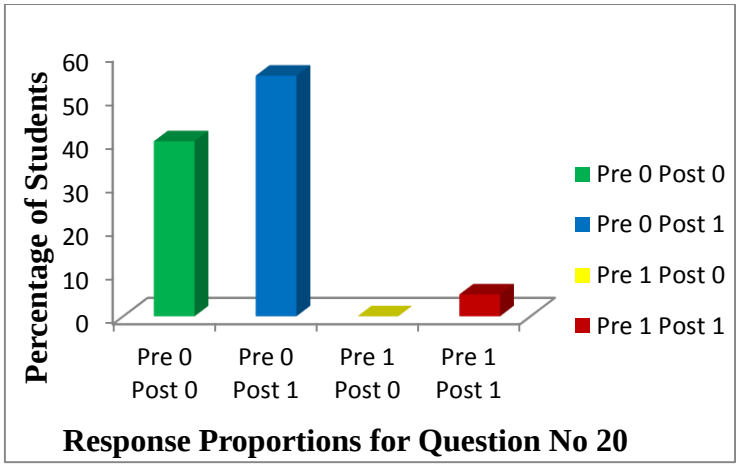

Figure 13: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 20.*

Six out of twenty (30 %) students moved from incorrect response to correct response and fourteen students (70%) provided correct response in both the conditions for question 30. Figure14 shows proportions of students providing correct and incorrect response on pre and post questionnaire conditions for question no 30 (Teaching a child from immediate natural context is called incidental teaching). The results indicated a significant improvement (χ^2=4, df = 1, p<0.05) from pre to post questionnaire for question no 20 & 30 in students.

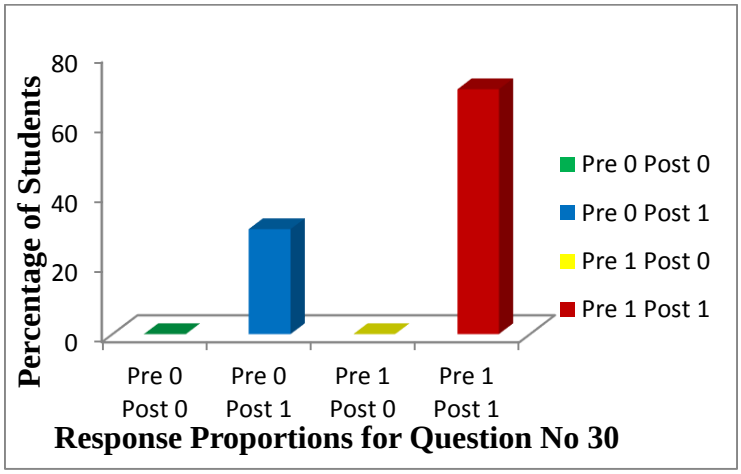

Figure 14: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 30.*

Most of the students obtained correct response in post questionnaire for question no 20 and result indicates that the video module helped these students to improve their concept of generalization in ABA. Before the video the students would have confused between DTT

and ABA. After the administration of video module, it helped the students to enhance their knowledge about ABA. Few students obtained correct response in post questionnaire for question no 30 and result indicates that the video module helped these students to improve their concept of incidental teaching in EMT. Before the video the students would have confusions between procedures in EMT. Most of the students obtained correct response in both condition for question no 30. The video module helped these students to refresh their knowledge about incidental teaching procedure in EMT.

Question no 22, 29, 34 & 40

The performance of students improved after viewing the video module as eleven out of twenty (55%) students moved from incorrect response to correct response and nine students (45%) provided correct response in both the conditions for question no 22 & 34. Figure15 shows percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 22 (In the initial stages child learns the picture exchange communication through two person prompting) & 34 (In PRT Natural reinforcements are provided to children).

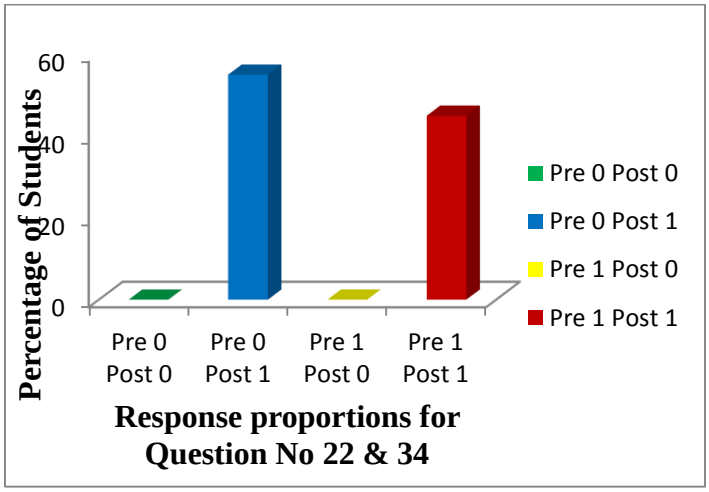

Figure 15: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 22 & 34.*

The performance of students improved after viewing the video module as eleven out of twenty (55%) students moved from incorrect response to correct response. Nine students (45%) provided correct response in both conditions. Figure16 shows percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 29 (Mand model consist of a question followed by a pause). Figure17 shows percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 40 (Work system includes physical arrangement of different areas). The performance of students improved after viewing the video module as eleven out twenty (55%) of the students moved from incorrect response to correct response. Eight students (40%) provided incorrect response in both the conditions and one student (5%) provided correct response in both conditions. The results indicated a significant improvement (χ^2=9.09, df = 1, p<0.01) from pre to post questionnaire for question no 22, 29, 34 & 40 in students.

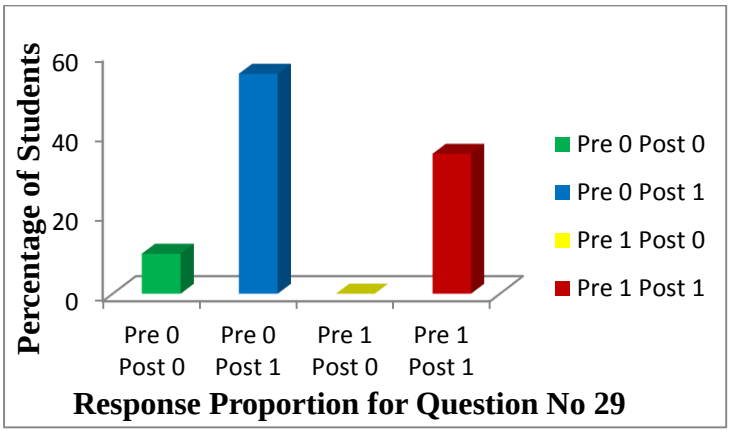

Figure 16: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 29.*

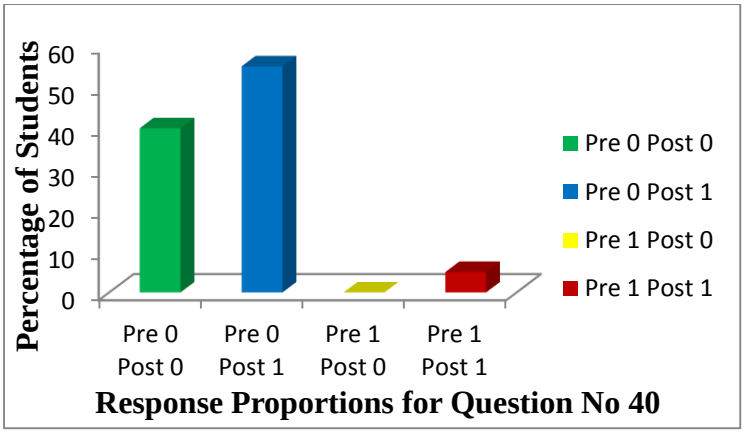

Figure 17: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 40.*

Most of the students obtained correct response in post questionnaire for question no 22 & 34 and result indicates that the video module helped these students to improve their concept of two person prompting in PECS and Natural reinforcement in PRT. Before the video the students had limited knowledge about two person prompting in PECS and natural reinforcements in PRT and the concept improved after viewing video module. Few students obtained correct response in both pre and post questionnaire and they would have learned these concepts during their course work. The video module helped these students to refresh their knowledge about two person prompting in PECS and use of natural reinforcements in PRT. Most of the students obtained correct response in post questionnaire for question no 29 result indicate that the video module helped these students to improve their concept of Mand model in EMT. Before the video the students had limited knowledge about Mand model and the concept improved after viewing the video module.

Question no 23 & 26

Seven students (35%) moved from incorrect response to correct response from pre to post questionnaire for both questions. Twelve students (60%) provided correct response and one student (5%) provided incorrect response in both pre and post questionnaire conditions.

The change in response from pre questionnaire to post questionnaire condition was not significant except pre 0 to post 1 condition ($\chi^2 = 3.12, df = 1, p > 0.05$) for these two questions. The change in response proportions was present in few children. The students knew the information and hence, differences in response proportions were not evident from pre to post questionnaire condition. The students achieved the fundamental information through theoretical course work of graduation. Since students already knew these concepts the improvement could not be seen after administration of video module. The video module would have helped the children to maintain their knowledge regarding these concepts.

Question no 28

Four students (20%) moved from incorrect response to correct response from pre to post questionnaire for this questions (EMT uses drill practice of the target items). Ten students (50%) provided incorrect response and five students (25%) provided correct response in both pre and post questionnaire conditions. One student (5%) changed the response from correct to incorrect from pre to post questionnaire condition. The change in response from pre questionnaire to post questionnaire condition was not significant ($\chi^2 = 0.8, df = 1, p > 0.05$) for this question. Students would have confused between the concept drill practice and generalization. The concept was not clear to students after video administration hence the explanation should be altered in the video module for better understanding of the particular concept.

Question no 33

Figure18 shows proportions of students providing correct and incorrect response on pre and post questionnaire conditions for question no 33 (PRT focus on pivotal areas of child's development). The performance of students improved after viewing the video module as ten out of twenty (50%) students moved from incorrect response to correct response. One

student (5%) provided same incorrect response and nine students (45%) provided correct response in both the conditions. The results indicated a significant improvement ($\chi^2 = 8.1$, df = 1, $p < 0.01$) from pre to post questionnaire for question no 33 in students.

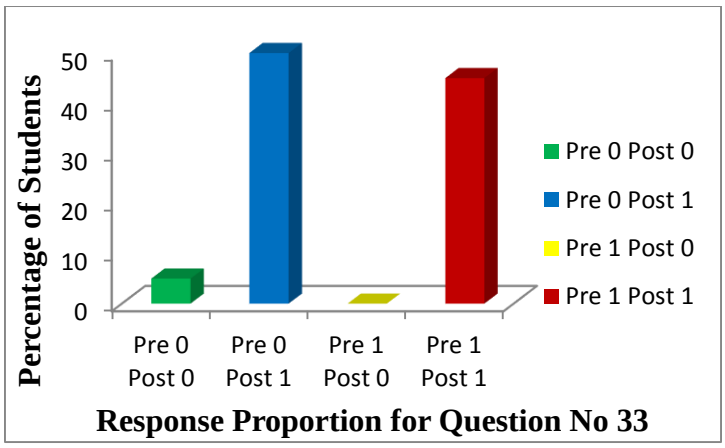

Figure 18: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 33.*

Most of the students obtained correct response in post questionnaire for question no 33 and result indicates that the video module helped these students to improve their concept of PRT. Before presentation of the video the students had limited knowledge about concept of PRT. Few students obtained correct response in both the conditions. After viewing video module most of the children reported that concept of PRT is knew to them. Hence the correct response obtained in pre questionnaire could be attributed to chance errors because of close end nature of the questionnaire.

Question no 35

Figure19 shows proportions of students providing correct and incorrect response on pre and post questionnaire conditions for question no 35 (Child choose activity and reinforcements options in PRT). The performance of students improved after viewing the video module as twelve out twenty (60 %) of the students moved from incorrect response to

correct response. Seven students provided correct response in both conditions. The results indicated that there was a significant improvement ($\chi^2 = 7.69, df = 1, p<0.01$) from pre to post questionnaire for question no 35 in students.

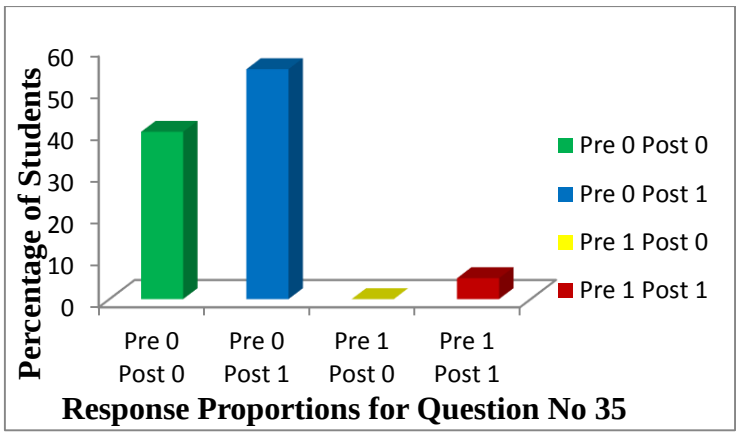

Figure 19: *Percentage of students providing correct and incorrect response on pre and post questionnaire conditions for question no 35.*

Most of the students obtained correct response in post questionnaire for question no 35 and result indicates that the video module helped these students to improve their concept of child's choice of activity in PRT. Before the video the students had limited knowledge about procedure of PRT. Few students obtained incorrect response in both the conditions and this could be due to the confusion between concepts of ABA and PRT.

Question no 38

Five students (25%) moved from incorrect response to correct response from pre to post questionnaire and fifteen students (75%) provided correct response in both pre and post questionnaire conditions. The change in response from pre questionnaire to post questionnaire condition was not apparent and the transformation of responses were not significant ($\chi^2 = 3.2, df = 1, p>0.05$) for this question. The change in response proportions was present in few students. The question was easy and students knew the fundamental information and hence differences in response proportions were not evident from pre to post

questionnaire condition. The students achieved the fundamental information through theoretical course work of graduation. Since students already knew these concepts the improvement could not be seen after administration of video module. The video module would have helped the students to maintain their knowledge regarding this concept.

In general, students obtained both positive and negative change in the response from pre to post questionnaire condition. Few students obtained identical response in both the conditions. The negative change in response and identical incorrect responses for few questions could be due to chance errors. The identical correct responses could be attributed to prior knowledge of the concept due to course work influence and clinical knowledge or chance errors due to close end nature of the question. The positive change in response proportion from pre to post questionnaire condition confirms the effectiveness of the video module developed. For all the eighteen questions the improvement was significant and all these questions improved their knowledge of particular management technique. The change in response proportion was more evident in the questions related to specific management techniques (EMT, PECS, TEACCH, and PRT). In the pre questionnaire most of the students did not attempt the questions for TEACCH and PRT. The change in response proportion signifies that after video administration their knowledge improved in particular for TEACCH & PRT. In introduction, the change in response proportion was not significant for most of the questions and proves basic knowledge of students about few concepts in management of ASD.

The response proportion analysis in students indicates significant improvement in most of the questions and hence the developed video manual is useful for this particular population. The video manual will help the students to enhance their knowledge of different management techniques and to become better clinicians to provide effective management to ASD. A Speech Language Pathologist should have thorough knowledge of various

characteristic features of disorders, assessment, management options and its clinical application. The documentary films will help to enhance these features and in turn help student clinicians to provide effective services to children and adults with communication disorders.

Response Proportion analysis in Mothers

In mothers the McNemar's test indicated a significant change from pre to post questionnaire condition in twenty one questions out of forty questions. Reponses in remaining question has also changed from pre questionnaire to post questionnaire, but the transformation was not significant.

Question no 1, 4, 18, 28 & 32

Two mothers (13.3%) moved from incorrect response to correct response, eleven mothers (73.3%) provided incorrect response and two mothers (13.3) provided correct response in both pre and post questionnaire conditions for question no 1 (The difficulties in communication, social interaction and poor mental abilities are the triad of symptoms in Autism Spectrum Disorders) & 32 (PRT starts with neutral items and move on to preferred items). Two out of fifteen (13.3%) mothers moved from incorrect response to correct response and thirteen mothers (86.7%) provided correct response in both the conditions in question no 4 (A child with Autism Spectrum Disorder does not need intensive teaching session) & 18 (Positive reinforcement increases the behavior on providing the desired item). Two mothers (13.3%) moved from incorrect response to correct response, one mother (6.7%) provided correct response and twelve mothers (80%) provided incorrect response for question no 28 (EMT uses drill practice of the target items). The results indicated that there was no significant response transformation ($\chi^2 = 0.5$, $df = 1$, $p > 0.05$) from pre to post questionnaire for all these questions in mothers.

Majority of the mothers provided incorrect response in both the conditions for question no 1 and could be attributed to mother's lack of knowledge of the term repetitive and stereotyped behaviors and misinterpretation of poor mental abilities as one of the triads of symptoms in ASD. Majority of the mothers provided incorrect response for question no 28 & 32 in both the conditions and could be attributed to mother's lack of knowledge of the concept of EMT and PRT respectively. Both EMT and PRT was completely a new concept to mothers and learning a new concept will take time. Perhaps by repeated practice using video module mothers could enhance their knowledge of EMT and PRT. In question no 4 & 18 most of the mothers obtained correct response in both the conditions and could be due to their experience with ASD and knowledge obtained from professionals regarding the characteristics and procedure of management techniques.

Question no 2

Four out of fifteen (26.7%) mothers moved from incorrect response to correct response, seven mothers (46.7%) provided incorrect response and two mothers (13.3%) provided correct response in both the conditions for question no 2 (All the management techniques of Autism Spectrum Disorders are based on behavioral principles). Two mothers (13.3%) changed the response from correct to incorrect from pre to post questionnaire condition for the same question. The results indicated that there was no significant response transformation (χ^2=0.17, df = 1, p>0.05) from pre to post questionnaire for this question in mothers. Majority of the mothers provided incorrect response in both the conditions for question no 1 and could be attributed to mother's lack of knowledge of the different management approaches. Mothers would have confused between behavioral issues in children and management of the behavioral issues using behavioral principles.

Question no 5, 8, 9, & 37

Three out of fifteen (20%) mothers moved from incorrect response to correct response, six mothers (40%) provided incorrect response and four mothers (26.7%) provided correct response in both the conditions in question no 5 (The management techniques for other communication disorders can be adapted for the management of Autism Spectrum Disorders). Two mothers (13.3%) changed their response from pre to post questionnaire condition in question no 5. One mother (6.7%) moved from incorrect response to correct response, twelve mothers (80%) provided correct response and one mothers (6.7%) provided incorrect response in both pre and post questionnaire conditions for question no 8 (The children with Autism Spectrum Disorders respond equally to all management techniques). One mother (6.7%) changed the response from correct to incorrect from pre questionnaire to post questionnaire condition for the same question. One mothers (6.7%) moved from incorrect response to correct response and fourteen mothers (93.3%) provided correct response in both pre and post questionnaire conditions for question no 9. Fourteen mothers (93.3%) provided incorrect response in both the conditions and one mother (6.7%) changed the incorrect response to correct response for question no 37 (Physical organization is the arrangement of activities for each session). The results indicated that there was no significant response transformation ($\chi^2=0, \mathrm{df}=1, p>0.05$) from pre to post questionnaire for all these questions in mothers.

Mixed results were found for question no 5, as few mothers showed improvement, few mothers obtained incorrect responses in both conditions and few of them obtained correct response in both the conditions. The result reveals that the mothers are not confident about the adaptation of different management techniques for ASD after viewing video module.

Majority of the mothers provided incorrect response in both the conditions for question no 37 and could be attributed to mother's lack of knowledge of the term physical organization in TEACCH. TEACCH was completely a new concept to mothers and learning a new concept is time consuming. Perhaps by repeated practice using video module mothers could enhance their knowledge of TEACCH. In question no 8 & 9 most of the mothers obtained correct response in both the conditions and could be due to their experience with ASD and knowledge obtained from professionals regarding the characteristics features exhibited by ASD.

Question no 12, 13, 19, & 40

Three out of fifteen (20%) mothers moved from incorrect response to correct response and twelve mothers (80%) provided correct response in both the conditions for question no 12 (Constant instructions should be used in initial stages of DTT) & 13 (Periodic change of reinforcement increases child's response). Three mothers (20%) changed their response from incorrect to correct and twelve mothers (80%) provided incorrect response in both pre and post questionnaire conditions for question no 40 (Work system includes physical arrangement of different areas). Three mothers (20%) changed the response from incorrect to correct from pre questionnaire to post questionnaire condition, eleven mothers (73.3%) provided incorrect response and one mother provided correct response in both the conditions for question no 19 (Negative reinforcement decreases the behavior on providing the desired item). The results indicated that there was no significant response transformations (χ^2=1.33, df = 1, p>0.05) from pre to post questionnaire conditions for all these questions in mothers.

In question no 12 & 13 most of the mothers obtained correct response in both the conditions and could be due to their experience with ASD and knowledge obtained from professionals regarding the procedure of general management technique. Majority of the

mothers provided incorrect response in both the conditions for question no 19 & 40 and could be attributed to mother's lack of knowledge of negative reinforcement in ABA and work system in TEACCH. The terminologies and concepts would have confused the mothers. Perhaps by repeated practice using video module mothers could enhance their knowledge of negative reinforcement and work system. By including further explanations and providing orientation about one technique at a time would help the mothers to enhance the knowledge.

Question no 6, 24, 29 & 31

Figure 20 shows percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 6 (Autism Spectrum Disorders is also known as Pervasive Developmental Disorders) & 24 (PECS improves requesting, answering, and commenting skills in children with Autism Spectrum Disorders).

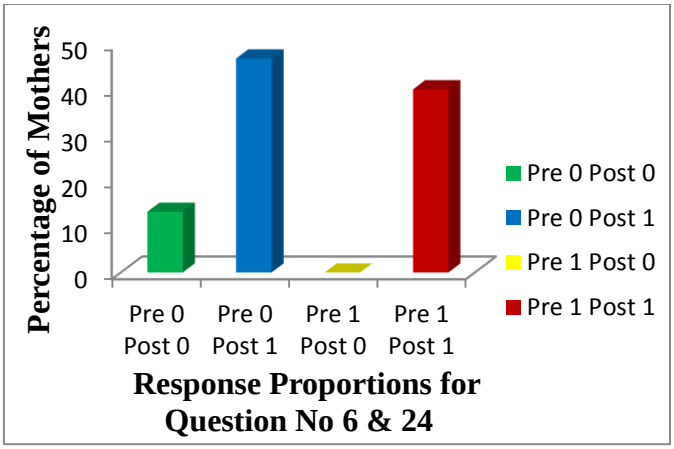

Figure 20: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 6 & 24.*

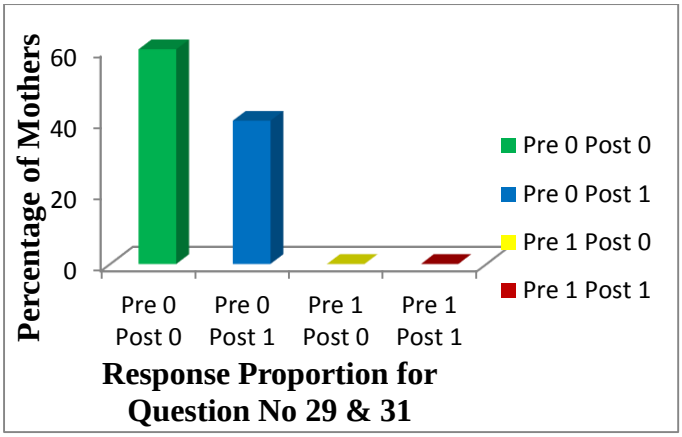

Figure 21: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 29 & 31.*

Figure 21 shows percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 29 (Mand model consist of a question followed by a pause) & 31 (PRT targets only one behavior at a time in children with Autism Spectrum Disorder). The performance of mothers improved after viewing the video module as six out of fifteen (40%) of mothers moved from incorrect response to correct response for all these questions. Nine mothers (60%) provided correct response in both pre and post questionnaire conditions for question no 6 & 24. Nine mothers (60%) provided incorrect response in both pre and post questionnaire conditions for question no 29 & 31. The results indicated a significant improvement ($\chi^2 = 4.16, df = 1, p < 0.05$) from pre to post questionnaire for all these questions in mothers.

Most of the mothers obtained correct response in post questionnaire for question no 6 & 24 and result indicates that the video module helped these mothers to learn a new term PDD and improve the knowledge of different phases in PECS. Before the video the mothers were no aware of the term PDD and had limited knowledge about PECS. Few mothers obtained correct response in both pre and post questionnaire as they knew the information through clinicians. Most of the mothers obtained incorrect response in both the conditions for question no 29 & 31 and result indicates that the video module does not help the mothers to

learn Mand model in EMT and concept of PRT. Before the video the mothers were not aware of EMT and PRT but after viewing the video they would have confused between the different procedures and techniques. Perhaps by repeated practice using video module mothers could enhance their knowledge of EMT and PRT. By including further explanations and providing orientation about one technique at a time would help the mothers to enhance their knowledge.

Question no 7, 11, 15, 21 & 30

The performance of mothers improved after viewing the video module as seven out of fifteen (46.7 %) mothers moved from incorrect response to correct response for question no 7, 11, 15, 21 & 30. But other response patterns differed for each questions. In question no 7, seven mothers (46.7%) provided same correct response and one mother (6%) provided incorrect response in both conditions. Figure 22 shows percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 7.

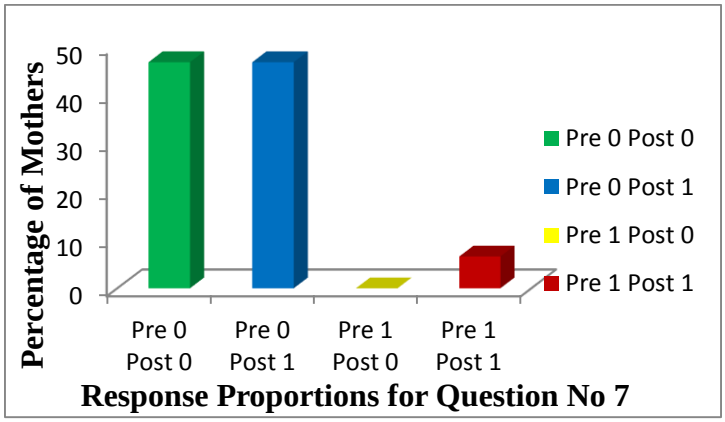

Figure 22: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 7.*

The figure 23 explains the response pattern for question no 30 in both conditions. Two mothers (13%) provided incorrect response and six mothers (40%) provided correct response in both conditions for question no 30. Figure 24 shows percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for

question no 15. In question no 15, seven mothers (46.7%) provided the same incorrect response and one mother (6.6%) provided correct in both the conditions.

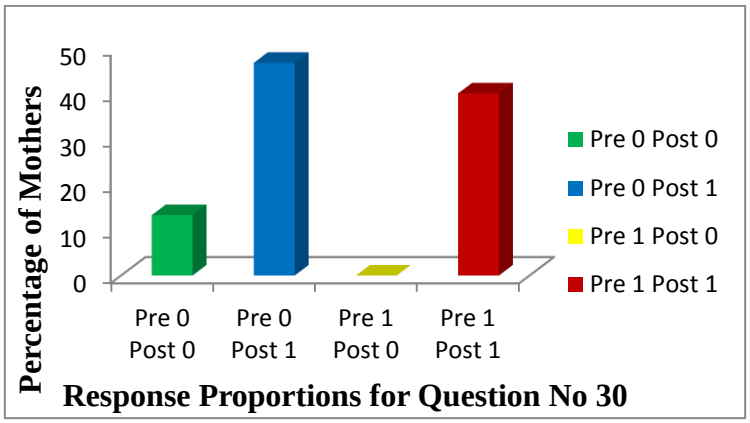

Figure 23: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 30.*

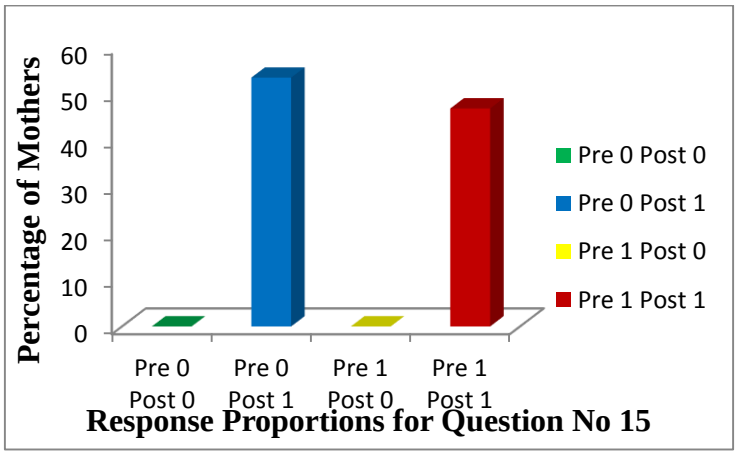

Figure 24: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 15.*

In question no 11 & 21, eight mothers (53%) provided similar correct response in both conditions. The figure 25 explains the response pattern for question no 11& 21 in both conditions. The results indicated that there was a significant improvement (χ^2=5.14, df = 1, p<0.05) from pre to post questionnaire for all the specified question in mothers.

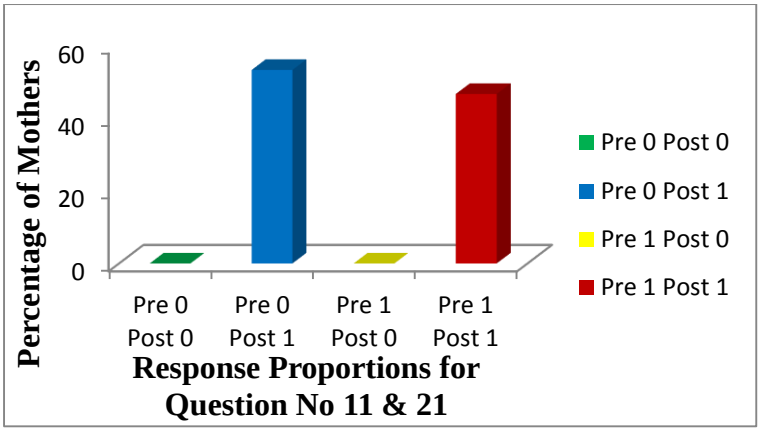

Figure 25: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 11 & 21.*

Most of the mothers obtained correct response in post questionnaire for question no11, 15, 21 & 30 and result indicates that the video module helped the mothers to learn concepts of DTT, PECS and EMT procedure. Few mothers obtained correct response in both the conditions and indicates that mothers knew the information by means of counseling by the professionals. Few mothers obtained correct response for question no 7 in post questionnaire and indicate the effectiveness of video module but at the same time few of them obtained incorrect response in both the conditions. The result indicates that the video module does not help these mothers to learn the purpose of TEACCH. Perhaps by repeated practice using video module mothers could enhance their knowledge of TEACCH as an educational intervention technique.

Question no 10 & 26

The performance of mothers improved after viewing the video module as eight out of fifteen (53.3%) of mothers moved from incorrect response to correct response for these two questions. Seven mothers (46.7%) provided correct response in both the conditions for question no 10. Figure 26 and 27 shows percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 10 & 26 respectively.

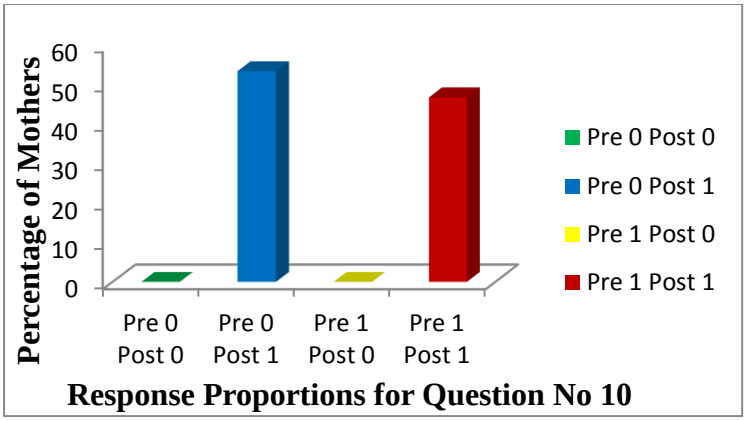

Figure 26: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 10.*

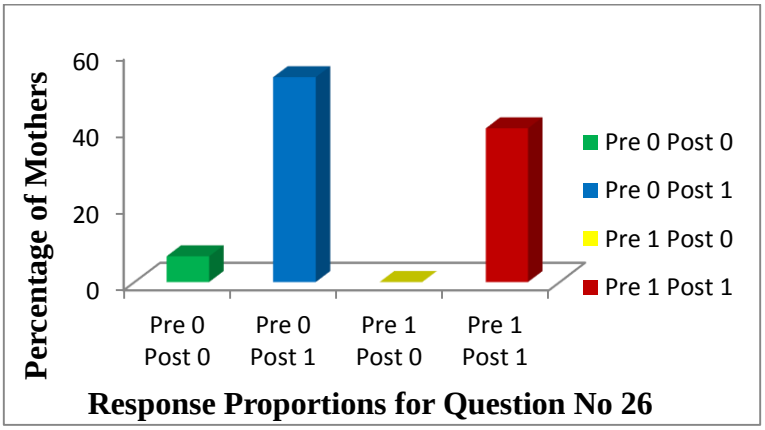

Figure 27: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 26.*

In question no 26, six mothers (40%) provided same correct response in both the conditions and one mother (6.6%) provided incorrect response in both the conditions. The results indicated that there was a significant improvement (χ^2=6.12, df = 1, p<0.05) from pre to post questionnaire for all these question in mothers. Most of the mothers obtained correct response in post questionnaire for question no10 & 26 and result indicates that the video module helped the mothers to learn subgroups of ASD and role of adult in EMT. Few mothers obtained correct response in both the conditions and indicates that mothers knew the information by means of counseling by the professionals or they provided chance errors. The result indicates that the video module helped most of the mothers and repeated practice using

video module is necessary to few mothers to augment the knowledge of management techniques.

Question no 14

Figure 28 shows percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 14. The performance of mothers improved after viewing the video module as eight out of fifteen (53.3%) mothers moved from incorrect response to correct response. Five mothers (33.3%) provided incorrect response and one mother (6.6%) provided correct response in both the conditions. One mother changed the response from correct to incorrect in post questionnaire condition. The results indicated a significant improvement ($\chi^2=4, df=1, p<0.05$) from pre to post questionnaire for question no 14 in mothers.

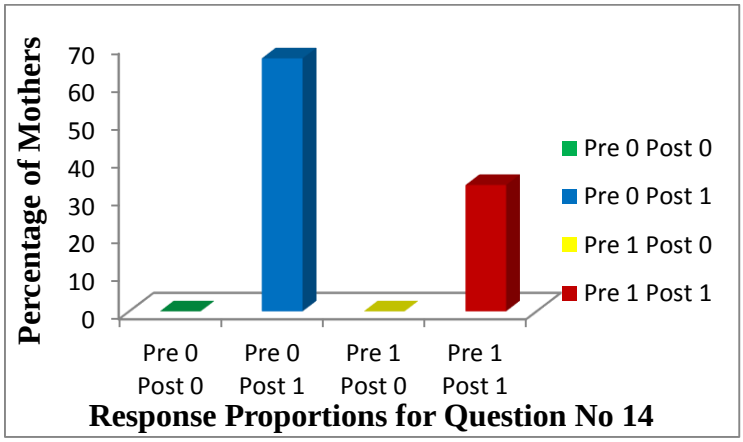

Figure 28: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 14.*

Most of the mothers obtained correct response in post questionnaire for question no 14 and result indicates that the video module helped the mothers to learn concepts of mass trial in DTT. Few mothers obtained correct response in both the conditions and indicates mother's prior knowledge or chance errors provided by mothers.

Question no 16 & 36

Figure 29 shows percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 16 & 36. The performance of mothers improved after viewing the video module as 10 out of fifteen (66.7 %) of mothers moved from incorrect response to correct response. Five mothers (33.3%) obtained correct response in both the conditions. The results indicated that there was a significant improvement (χ^2=8.1, df = 1, p<0.01) from pre to post questionnaire for these two question in mothers.

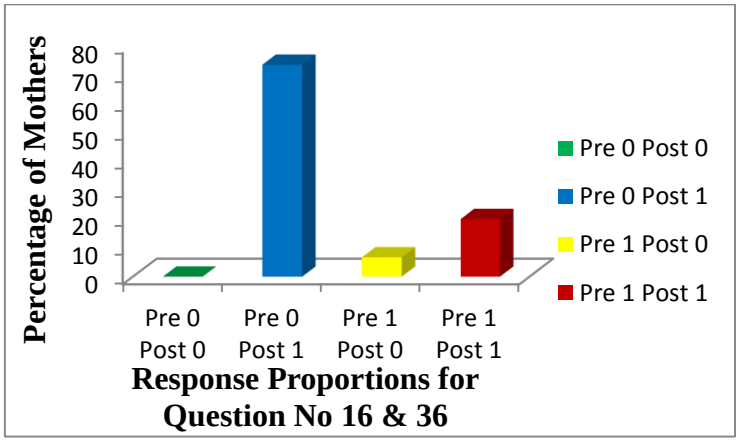

Figure 29: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 16 & 36.*

Most of the mothers obtained correct response in post questionnaire for question no 16 & 36 and result indicates that the video module helped the mothers to learn concepts of ABC analysis in ABA and importance of TEACCH. Hence the developed video module is useful for the mothers of children with ASD.

Question no 17.

Four out of fifteen (26.7%) of mothers moved from incorrect response to correct response and eleven mothers (73.3%) provided incorrect response in both pre and post questionnaire conditions for question no 17. The results indicated that there was no significant response transformations (χ^2=2.25, df = 1, p>0.05) from pre to post

questionnaire for this question in mothers. Hence the video module does not help the mothers to differentiate between antecedence and consequence in ABA. Additional information is necessary for mothers to improve the concept of antecedence in ABA.

Question no 20 & 22

The performance of mothers improved after viewing the video module as nine out of fifteen (60%) mothers moved from incorrect response to correct response. Five mothers (33.3%) provided correct response and one mother (6.6%) provided incorrect response in both the conditions. Figure 30 shows percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 20 & 22. The results indicated that there was a significant improvement (χ^2=7.11, df = 1, p<0.01) from pre to post questionnaire for question no 20 & 22 in mothers.

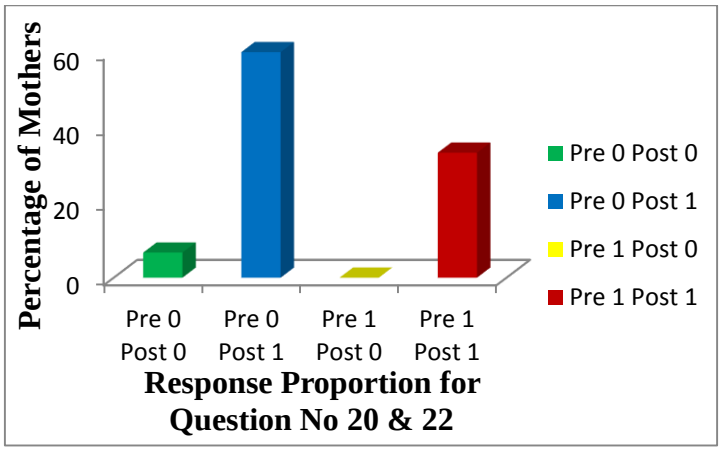

Figure 30: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 20 & 22.*

Most of the mothers obtained correct response in post questionnaire for question no 20 & 22 and result indicates that the video module helped the mothers to learn the concept of generalization in ABA and two person prompting in PECS. Hence, the developed video module is useful for the mothers of children with ASD to enhance the knowledge of different management techniques.

Question no 23

Five out of fifteen (33.3%) of mothers moved from incorrect response to correct response, six mothers (40%) provided incorrect response and three mothers (20%) provided correct response in both pre and post questionnaire conditions for question no 23. One mother (6.7%) changed the response from correct to incorrect from pre to post questionnaire conditions for the same question. The results indicated that there was no significant response transformations ($\chi^2 = 1.5, df = 1, p > 0.05$) from pre to post questionnaire for this question in mothers. Mixed results were obtained for question no 23. Hence, additional information is necessary for mothers to improve the concept of usefulness of PECS for verbal children with ASD.

Question no 25

Four out of fifteen (26.7%) of mothers moved from incorrect response to correct response, one mothers (6.7%) moved from correct response to incorrect response from pre to post questionnaire condition for question no 25. Nine mothers (60%) provided incorrect response and one mother (6.7%) provided correct response in both pre and post questionnaire conditions for question this question. The results indicated that there was no significant response transformations ($\chi^2 = 1.5, df = 1, p > 0.05$) from pre to post questionnaire for this question in mothers. Mixed results were obtained for question no 25. Hence, additional information is necessary for mothers to improve the concept of discrimination in PECS.

Question no 27

Five out of fifteen (33.3%) mothers moved from incorrect response to correct response, one mother (6.7%) provided incorrect response, nine mothers (60%) provided correct response in both pre, and post questionnaire conditions for question no 27. The

results indicated that there was no significant response transformations (χ^2=1.5, df = 1, p>0.05) from pre to post questionnaire for this question in mothers. Mixed results were obtained for question no 27. Hence, additional information is necessary for mothers to improve the concept of time delay procedure in EMT.

Question no 33

Figure 31 shows percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 33. The performance of mothers improved after viewing the video module as eleven out of fifteen (73.3%) mothers moved from incorrect response to correct response. One mother (6.6%) changed the pre questionnaire correct response to incorrect response in post questionnaire condition. Three mothers (20%) provided correct response in both the conditions.

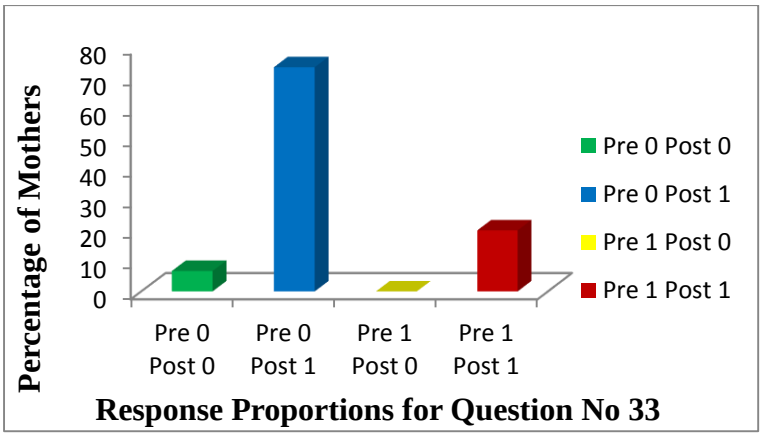

Figure 31: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 33.*

The results indicated a significant improvement (χ^2=6.75, df = 1, p<0.01) from pre to post questionnaire for question no 33 in mothers. Most of the mothers improved the response from pre to post and indicates that the video module helped them to improve the knowledge of goals of PRT. Before the video administration the mothers were unaware of PRT procedure and goals and after video administration their knowledge has improved.

Question no 34

Figure 32 shows percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 34. The performance of mothers improved after viewing the video module as eleven out of fifteen (73.3%) mothers moved from incorrect response to correct response. Three mothers (20%) provided correct response and one mother (6.6%) provided incorrect response in both the conditions. The results indicates a significant improvement ($\chi^2 = 9.09, df = 1, p < 0.01$) from pre to post questionnaire for question no 34 in mothers.

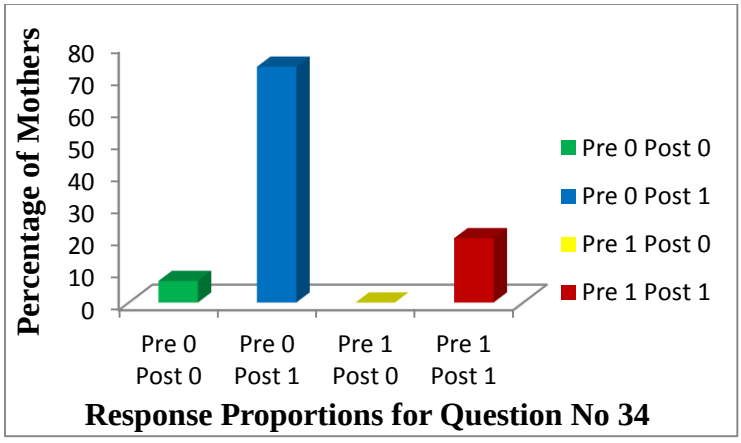

Figure 32: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 34.*

Most of the mothers improved the response from pre to post and, indicates that the video module helped them to improve the knowledge of natural reinforcements in PRT. Before the video administration, the mothers were unaware of PRT procedure and after the video administration their knowledge has improved.

Question no 35

Figure 33 shows percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 35. The performance of mothers improved after viewing the video module as twelve out of fifteen (80%) mothers moved from

incorrect response to correct response. One mother (6.6%) obtained incorrect response and two mothers (13.3%) obtained correct response in both the conditions. The results indicated a significant improvement (χ^2=10.08, df = 1, p<0.01) from pre to post questionnaire for question no 35 in mothers.

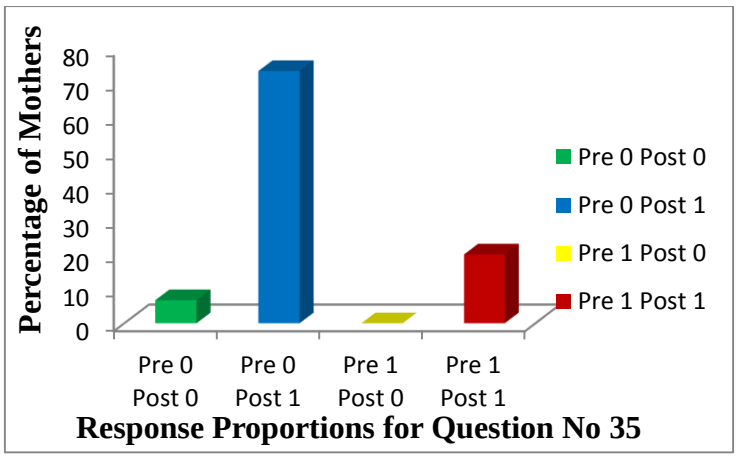

Figure 33: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 35.*

Question no 38 & 39

The performance of mothers improved after viewing the video module as thirteen out of fifteen (86.7 %) mothers moved from incorrect response to correct response. Two mothers (13.3%) provided correct response in both the conditions. Figure 34 shows percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 38 & 39 The results indicated a significant improvement (χ^2=11.07, df = 1, p<0.01) from pre to post questionnaire for these two question in mothers.

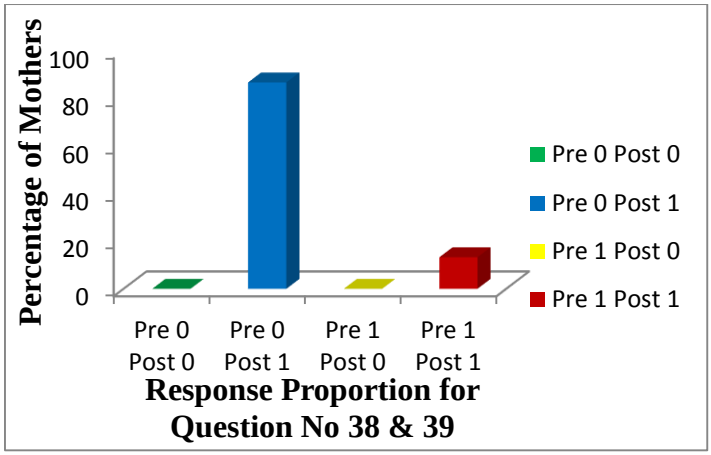

Figure 34: *Percentage of mothers providing correct and incorrect response on pre and post questionnaire conditions for question no 38& 39.*

Most of the mothers improved the response from pre to post and indicates that the video module helped them to improve the knowledge of physical organization and scheduling in TEACCH. Before the video administration the mothers were unaware of components of TEACCH and after video administration their knowledge has improved.

In general, for twenty one questions the response proportion has changed significantly from pre to post questionnaire condition in mothers. The change was seen in the remaining nineteen questions but that was not significant. Hence the result shows that the video module helped the mothers to improve the concept and understand the terminologies. The audio visual materials play an important role in learning process. Visual modules and documentaries have been widely used in the educational set ups to train the students and professionals. The results of the response proportions analysis in mothers signify the improvement in their knowledge after video administration.

There was a significant difference on most of the questions from pre to post questionnaire condition; there were few questions which showed no significant differences. The change in the trend itself is indicative of the effectiveness of the video in learning process of a particular concept. However, McNemar test revealed a negative trend for questions, where in participants obtained correct response in pre questionnaire and incorrect

response in post questionnaire condition. This indicates an error in their responses due to closed ended questions where chances of mere guess are quite high. Such responses cannot be considered as reliable. By using auditory and visual messages, students and mothers can process the information quicker and this in turn fosters their learning process.

The present study establishes improvement in student's and mother's responses in post questionnaire conditions after viewing the video module and signifies an improvement in knowledge related to management techniques in ASD. It shows that the developed video module on management techniques for children with ASD is helpful in facilitating concepts for undergraduate students of speech and hearing profession and mothers of children with ASD. An improving trend in the performance of students and mothers indicatives the strong foundation of the developed video module in training professionals and parents in the field of management of ASD. The result of the current study is in agreement with study done by Krishna and Prema (2014). They had developed a video training module to assess pragmatic skills in normal children. The study revealed that the video recordings play an important role in the assessment of pragmatic skills. The developed video module helped the SLPs to rate the pragmatic skills in an effective manner. They discussed the importance of video based assessment to train SLPs to improve the quality of assessment in children.

Gopi Sankar et al (2011) developed a video data base for assessment of voice and its disorders and study revealed significant improvement in student's performance after viewing the developed video module. They suggested the usage of multimedia presentation to build foundation in students and to improve knowledge in professionals. The result of the study also supports the findings of the present study to use documentary films and videos to educate clinicians and parents to improve knowledge regarding assessment and management of various communication disorders.

Thus, the current study emphasizes the role of video module to train students and mothers to improve their knowledge of different management techniques both in theoretical and practical aspects. In Indian context, this is the first video module, which is developed and field tested for management of ASD. The module acts as a reference for professionals and parents during teaching sessions of ASD and help to handle the children with ASD in an effective manner. The video module will help both clinicians and mothers to improve their clinical knowledge in terms of management of children with ASD. The case demonstrations of each management techniques will help the mothers in learning the procedure and steps in different management techniques. The study signifies the importance of audio visual presentation for improving the knowledge of students and mothers regarding different management techniques of ASD. The student clinicians are the ones who provide clinical management and mothers are the one who provide home therapy to children with ASD. The video module helps the clinicians and mothers to improve the various developmental aspects in these children with ASD to improve their quality of life. Hence, current study highlights the importance and need to develop audio video database for assessment and management of various communication disorders. This tool can be used to educate and train students in the field of communication disorders and parents of children with communication disorders.

CHAPTER V

SUMMARY AND CONCLUSION

Children with ASD are exceptional and unique. The ASD is a heterogeneous population and hence the management of this population is very challenging. The specific management techniques for these children focus on speech and language aspects, behavioral aspects, sensory aspects and educational aspects. The applications of these management techniques vary from child to child. The prevalence and incidence of autism is also growing. However, the systematic use of these techniques by both students and parents are still contradictory. Hence, it is very necessary to develop and standardize a video module for different management techniques in children with ASD. These manuscripts help clinicians and parents to deal with them appropriately. It will also serve as a reference for clinicians and parents of children with ASD. The present study was carried out as a first attempt to discuss the importance and usefulness of video module for different management techniques for children with ASD.

The current study was carried out in two phases. The first phase included preparation of script, video recording of the management techniques, preparation of the pre final video module, evaluation of the pre-final video module by SLPs and preparation of the final video module. The final video module included introduction to different management techniques (35 minutes duration) and case demonstrations of different management techniques (ABA, DTT, PECS, EMT, PRT, & TEACCH). Case demonstrations of each management technique were about 30 minutes.

The second phase included selection of participants, preparation of the video evaluation questionnaire and administration of the video module to participants. The participants were twenty intern students of speech and hearing field and fifteen mothers of

children with ASD. The video evaluation questionnaire included forty questions from video module related to the management techniques in ASD. The participants were asked to fill the questionnaire before and after administration of the video. Each correct answer was scored as one and each incorrect answer was score as zero. Total scores were calculated and statistical analysis was carried out.

The content validity of the video was evaluated using kappa coefficient and the inter judge reliability of all the videos ranged from 0.65-0.90 and indicated good agreement between judges. The results of the present study revealed a significant difference between pre and post questionnaire scores with in students and mothers. Both students and mothers indicated significant improvements in post questionnaire scores as compared to pre questionnaire scores. The results of the current study indicated that, both students and mothers were able to improve their concepts and knowledge related to different management techniques for children with ASD. Mothers asked for more clarifications and explanations of the terminologies and concepts in the video module during the administration as compared to students. In both pre and post questionnaire conditions the results revealed a significant difference between groups. The students scored significantly higher in both pre and post questionnaire conditions than mothers. This particular trend could be justified by discussing student's advantage during course work. As the students have basic knowledge about the terminologies and a few techniques the video module would have helped to refresh the basic knowledge and aided to enhance their knowledge. But, for most of the mothers all these information were novel and that helped them to be familiar with a few techniques and terminologies related to management techniques in children with ASD.

The comparison of correct response percentage between students and mothers in post questionnaire condition revealed that the two groups significantly differed from each other only for six questions out of forty questions. The percentage of correct response in post

questionnaire condition was similar in the two groups for thirty four questions. These results indicated that the developed video module was equally helpful for both groups in gaining practical knowledge.

The comparison of pre and post questionnaire response proportion analysis within groups indicated significant change in response from pre to post questionnaire condition in both the groups. Both students and mothers showed a trend of positive change in response from pre to post questionnaire condition (pre incorrect to post correct). The students showed this trend in eighteen out of forty questions and mothers exhibited the trend in twenty one questions out of forty questions. The negative change in response (pre correct to post incorrect) was also observed, but this trend was negligible in both the groups.

The present study establishes improvement in student's and mother's responses in post questionnaire conditions after viewing the video module that signifies an improvement in knowledge related to management techniques in ASD. Thus, the current study emphasizes the role of video module to train students and mothers to improve their knowledge of different management techniques both in theoretical and practical aspects. The module will help them to use it as a reference during teaching sessions of ASD and also to handle the children with ASD in an effective manner.

Implications

1. It would act as a reference for both clinicians and parents of children with ASD.
2. This could be used as an education material for both students and parents.
3. Additionally, it would aid in early intervention strategies for children with ASD through distance-mode intervention.
4. The developed video module sets the foundation for the research on other communication disorder population.

5. It would serve as a document for future research and could be used as a document for evidenced based practice.

Future Directions

1. The study can be replicated with a large sample size.
2. The response of student and parent population could be studied separately by modifying the content and script.
3. The video module for different management techniques in ASD could be developed by including case demonstration of children with different severity levels and age groups.
4. Future research based on video module for the purpose of tele-rehabilitation could be conducted.
5. The video module could be developed in different Indian language for better understanding of parents and family members of children with ASD.
6. The effectiveness of student and parent training on different management techniques for ASD using current video module could be studied.

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Appendix I

Script Board for the Management of Autism Spectrum Disorders

Shyamala K.Chengapa., Neethu Yasodharan P

Introduction to different management techniques

S No	Visual	Audio	Approx. Duration in sec.
1	Opening Copy write warning Logo of AIISH followed by project title- ‘’Development and Validation of video manual for different management techniques in ASD’’ Funding Agency Name Project Investigator’s Name Research Officer’s Name	’Development and Validation of video manual for different management techniques in ASD. The ASD is a heterogeneous population, thus management of this population is very important. There are number of different management techniques available for these children, but systematic use of these techniques by clinicians and parents are still contradictory. Hence there is a need to develop video manual for management techniques for these children.	33
2	*Objective* Text slide along with picture of manual and CD	The study was aimed to develop video manual for different management techniques in children with ASD and to validate the same	10
3	Implication Text slide	The professionals can use this video module to train students and educate parents about different management techniques. It can serve as a reference for clinicians and parents. It can serve as a document for future research.	26
4	ASD/PDDs Text slide	ASD is also known as PDD. ASD is a neuro-developmental disorder characterized by triad of symptoms which includes impairments in communication, social interaction and restricted and repetitive behaviours, activities and interests.	30
5	ASD Text slide	ASD is a range of disorders in which a group of individuals shares few similarities but differs in terms of quality and quantity of specific characteristics exhibited	13
6	ASD Text slide	According to DSM IV ASD include Autistic Disorder, Asperger Syndrome, Childhood Disintegrative Disorder, Rett Syndrome and PDD not otherwise specified. Each disorder differs from others in terms of specific features exhibited. In DSM V, ASD is considered as a single group without sub categories	30
7	Management techniques for ASD Text slide	There are different management techniques available for ASD. These techniques can be grouped into behavioural, naturalistic, developmental etc. There will be individualistic variations and each child performs differently to each management techniques. One technique that works for one child may not work for other child.	25
8	Typically Developing Children (TDC) Vs Children with ASD Text slide	Children with ASD (CWA) differ from Typically Developing Children (TDC) in terms of learning in many ways. CWA have poor observational skills hence they have few learn	25

		elements per day and specific instructions are necessary for them. TDC have good observational skills hence they have more learn elements per day and specific instructions are necessary for them	
9	More opportunities Text slide along with visuals of teaching session	Children with autism have to learn at a faster rate than typical peer to catch up. We should provide individualized intensive teaching to increase learning for these children.	15
10	Management Techniques Text slide	These are the different management techniques demonstrated in the study. Behavioral Management Approaches. Discrete Trial Training (DTT), Applied Behavior Analysis (ABA), Picture Exchange Communication System (PECS) comes under Behavioral Management Approach. Enhanced Milieu Teaching (EMT), Pivotal Response Training (PRT) comes under Naturalistic Behavior Management Approaches. Treatment and Education for Autism and related Communication Handicapped Children (TEACCH) comes under Class Room Based Approach.	30
11	Discrete Trial Training (DTT) Text slide	There are two view points about DTT. One group considers DTT as a Behavioral therapy technique while others consider it as a teaching strategy within ABA. DTT breaks down learning opportunities into simple and small units. It provides structure for the learning interaction and large number of learning opportunities in a small amount of time. It is conducted one-to-one in a distraction-free setup	30
12	Procedure Text slide followed by video	Clinician provides brief & distinctive instruction /question known as Discriminative stimulus and waits for child's response and provides prompts accordingly. Every correct response will be reinforced and prompts will be provided for each incorrect response. Small gap is provided between each trial.	40
14	Tips to Remember Text slide	The discriminative stimulus should be appropriate to child's language level. It should be constant at initial stage and later multiple stimuli can be added to child's vocabulary. The reward should be changed periodically according to child's response.	15
15	Presentation of stimulus Text slide	Stimulus can be presented in two ways: Mass Trial and Mixed Trial. In mass trial repeated practice of the same task will be carried out and it's easy to learn. As we provide same task again and again it becomes rote and sometimes hard to generalize. In mixed trial combination of related/unrelated tasks are provided. Due to same it is hard to learn for few children but it is more natural and easy to generalize.	25
16	Example of mass and mixed trials in table Therapy video mass and mixed trials	These are few examples of mass and mixed trial	120
17	Advantages Text slide	It follows consistent teaching pattern, hence easy to learn. It breaks down complex behaviors into simple units. it increases child's interests and practice. It targets both developmental	20

		skills and problem behaviours	
18	Applied Behavior Analysis Text slide	ABA is a systematic process based on behavioral principles to teach new skills and modify problem behaviors. In ABA all the behavior are considered as objective and measurable. ABA should be provided on one to one basis for intensive time period. Before the therapy baseline assessment is necessary to find out the actual level of the child. and during ABA therapy clinician will continuously monitor the behaviors and child current level can be compared to baseline	35
19	Behavioural listing Text slide	First clinician will list out all the skills and problem behaviours of the child. Later clinician will target the skills in developmental hierarchy and the behavior which is most frequent and harmful to the child.	15
20	Three term contingency Text slide	Behaviour is analyzed through a three term contingency known as ABC i.e .Antecedent Behavior and Consequence. Antecedent makes the behavior happen, and Consequence makes an increase/decrease in the behavior	20
21	Example of Three Term Contingency Text slide	This is an example of three term contingency, when adult provides stimulus 'Touch your nose', child responds to that by touching nose and in turn adult provides praise/toys/eatables as reaction. Response is depended on both stimulus and reaction. Stimulus should be clear and constant to avoid confusion. Here are some examples of instructions.	30
22	Presentation of stimulus Text slide	Get child's attention and present stimulus and waits for child's response. If child respond correctly provides reinforcement. If there is no response or response is incorrect, provide prompts.	15
23	Reinforcements Text slide with visuals of rewards	There are two types of reinforcements. Positive Reinforcement and Negative Reinforcement. In Positive Reinforcement frequency of behaviour increases on provide desired item immediately following response. In Negative Reinforcement frequency of behaviour increases on removing a desired item immediately following response. These are few examples of material and social rewards.	35
24	Schedules of reinforcement Text slide with videos of continuous and intermittent reinforcements	There are two types of Schedules of reinforcement: Continuous reinforcement and Intermittent reinforcements. In continuous reinforcement, reinforcement will be provided after each correct trial. Intermittent reinforcement is again divided into Fixed and Variable. In fixed intermittent reinforcement, reinforcement will be provided at fixed intervals of time. In variable intermittent reinforcement, reinforcement will be provided at variable intervals of time, but at fixed ratio.	95
25	Prompts Text slide with visuals of few prompts.	Prompts are information/assistance provided to child for better performance of the target behavior. It reduces the errors and speeds up correct response. Prompts should be gradually faded otherwise it leads to prompt dependency.	15
26	Prompt Hierarchy Text slide with videos of	Prompts always start with full physical prompt and end up with indirect prompt.	25

	prompts		
27	Generalization Text slide with visuals of different materials, settings and individuals.	Generalization is the central goal of ABA intervention. It does not occur automatically. Generalization should be carried out with respect to different materials, individuals, and settings. All the activities should be carried out with different individuals like teachers, parents and clinicians. Different materials like pictures, flash cards, miniature objects of the same target item should be used. The activities should be transferred to different settings like school and home.	40
28	Tips for generalization Text slide	Teach skills with many individuals in different environments. Teach during many different times of day. Do not do the same thing the same way all of the time. When skills are learned in therapy room /class room transfer that to home and other natural settings. Parents must practice all new skills as often as possible	20
29	Advantages Text slide	ABA is intensive and individualized. It follows a consistent teaching pattern, hence easy to learn. It targets both developmental skills and problem behaviours. Generalization is the central goal of ABA.	15
30	Picture Exchange Communication System (PECS) Text slide with visuals of PECS board.	PECS is a behavioral technique, in which child learns communication through pictures. It can be used for ASD of all age groups. PECS is more beneficial for children who are nonverbal. But can be used for verbal children to enhance language skills. The child is taught to exchange pictures rather than pointing to initiate communication. It has six phases/stages.	30
31	Phases of PECS Text slide with visuals of PECS board.	How to communicate, Distance and Persistence, Discrimination, Introducing sentences/ Sentence Construction, Teaching to answer questions, Teaching commenting	10
32	PECS Book Text slide with visuals of PECS book.	Readymade PECS books are available in market. We can make PECS book using laminated pictures of child's interests and daily use items. These pictures can be mount to board/file using Velcro strip. Later these pictures can be arranged according to categories.	25
33	Phase I : How to communicate Text slide with visuals of PECS phase I followed by video of phase I	First stage in PECS targets initiation of communication. This is three step sequence process where in child pick up, reach the communicative partner and release the picture. Child is trained with single picture at a time. The child has to provide the picture to the communicative partner and partner provides the desired item to the child.	60
34	Phase II: Distance and Persistence Text slide and visuals of phase II followed by video of phase II	In phase II main goal is to increase spontaneity of communication. Distance of both communication partner and communication book from child is increased. In this phase child uses single picture for communication with different individuals in different settings improve spontaneity of communication.	30
35	Phase III: Discrimination Text slide and visuals of phase III followed by video of phase	The third phase is picture discrimination. There are two types of discrimination: Simple Discrimination and Conditional Discrimination. In Simple Discrimination pictures of child's	55

	III	preferred and non preferred items will be provided and the preferred item will be provided. In Conditional Discrimination picture of equally preferred items will be provided. The child has to choose one and the item will be provided.	
36	Phase IV: Sentence Construction Text slide and visuals of phase IV followed by video of phase IV	The 4th phase in PECS targets sentence construction. Clinician will provide pictures of I want and child's interests. Clinician will prompt the child to make sentence (I want ball) and hand over the strip to clinician. Clinician in turn provides the desired item. Once child learns this, clinician increases sentence length by adding features of the item (color/size/quantity)	65
37	Phase V: Answering to Questions Text slide and visuals of phase V followed by video of phase V	5th phase targets answering skills. Clinician will ask simple question like What do you want? and prompts the child to arrange the pictures accordingly(for example: I want black pen).	15
38	Phase VI: Commenting Text slide and visuals of phase VI followed by video of phase VI	This phase targets commenting skills. The child is taught to comment on things. Clinician will ask questions like what do you see/hear/feel etc. Initially clinician provides prompts and later child has to do it independently.	45
39	Advantages of PECS Text slide	PECS requires interaction with other people. Child initiates communication in PECS. It starts with requesting, and moves to labelling and commenting. It increases child's motivation because of material rewards.	20
40	Enhanced Milieu Teaching (EMT) Text slide with visuals of EMT	EMT is a naturalistic behavioral technique. Adults can create natural environment for functional communication. It focuses on teaching functional skills for immediate use and focus on generalization and maintenance. Adults should model target words and expand child's utterances. On each correct attempt adult should praise and access to requested objects to encourages practice of new words.	35
41	Components and Procedures Text slide	Components of EMT are Environmental Arrangements and Responsive Interaction. Procedures of EMT are Modelling, Mand + Model, Time Delay and Incidental Teaching	15
42	Environmental Arrangements Text slide and visuals of environmental arrangements	Environmental Arrangement can be carried out in two ways: big environmental arrangement & little environmental arrangement. In big environmental arrangement child preferred activities and materials will be arranged and room will be arranged to promote child's engagement. Little environmental arrangement includes strategies carried out by adults to promote requesting during interaction.	30
43	Examples of Activities Text slide	These are tips and few examples of activities. Choose toys and materials which are developmentally appropriate and interesting to the child. Most importantly choose activities that promote speech and language targets. The activities should be incorporated in play routine. Simple cognitive task like cause and effect and means end relationship should be used. Simple tasks like vehicles on track, coloring, play dough and feeding babies could be conducted. We can arrange complex schemes	40

		like doll house, building blocks, cooking game, and role play.	
44	Responsive Interaction Text slide and visuals of responsive interaction followed by videos of responsive interaction.	Responsive interaction is necessary to sustain child's engagement. Following activities are used to sustain child's engagement. We have to observe and respond to each and every actions of the child. Motivate child by mirroring child's actions and exchanging materials. Talk about child's actions and explain your actions too. Take equal turns and be an engaging, responsive partner. Praise child's engagement and attempts, thus child knows that you notice his/her actions and change activity before child gets bored. Follow the child's lead by including topics and play materials of child's interests. Treat child's nonverbal turns as communication. Involve and expand child's play. Provide meaningful feedback to child for communicative behaviour.	80
45	Modeling Text slide and visuals of modeling followed by videos	Modeling is a procedure in EMT. It is the verbal/ nonverbal demonstrations provided to the child during interaction. We should expand child utterances both in terms of grammar and meaning. Adult should model specific language targets in context and talk at the target level appropriate to the child. Adult prompts child to imitate modeled language, it begins with "Say" followed by target item. Make the prompt clear to the child and waits for child's response. Model is repeated once if child does not respond. Approximations may be accepted. This is an example of modelled language.	65
46	Mand Model Text slide and visuals of mand model followed by videos	Mand Model is a prompt for a communicative response. An adult may ask real questions/ an instruction to verbalize preference/ an opportunity to indicate a choice etc. (for example what do you want?, Do you want milk or tea? etc). When child come up with responses, adult introduces modelling. These are the examples of mand model.	55
47	Time Delay (TD) Text slide	The third procedure is TD, it is the pause that transition to spontaneous requesting. Here is an example: take daily routine item like clothing. Take shirt and touch the button, look at child expectantly, WAIT….up to 5 sec. Complete the action when child says, help, button etc. This is an another example for TD	30
48	Incidental teaching Text slide and video of TD	The last procedure in EMT is incidental teaching. Teach child from context/environment. Utilize normally occurring situations and the child's interest to facilitate language learning. The situation or activity is "child selected". Adult uses all the three strategies appropriately (model, mand-model and time delay) in natural context	50
49	Advantages Text slide	It increases child use of targets and frequency of communication. It is more effective than drill-practice methods for early language learners	15
50	Pivotal Response Training Text slide	It is a naturalistic behavioral technique. It is multi-component intervention and focus on pivotal areas of a child's development which includes motivation, responses to multiple cues, self-management, and self-initiation. These are the areas which help the child to learn wide range of other skills	25

51	Aims of PRT Text slide	Child's motivation to learn Monitoring own behavior Responses to multiple cues Self initiation of communication and interaction Initially activities with preferred items will be carried out and later it will be faded to neutral items around in the environment. Therapy is provided in child's natural environment. Natural and targeted reward systems are taught to parents so they can implement them with their child. Young children with Autism are the most appropriate recipients of PRT (children who are elementary school aged or younger)	35
52	Main Goals Text slide	The main goals are: to teach language skills, to decrease disruptive/atypical/self-stimulatory behaviours and to increase social, communication, and academic skills	10
53	PRT Procedures Text slide followed by video of PRT	PRT is carried out in a natural environment (home/therapy room). The child-preferred activities and stimuli in the natural environment will be used, but adult control the situation. Adult allow the child to make choices during activities to increase child's motivation. Maintenance and acquisition tasks will be interspersed. Both adult and child will take turns and natural reinforcements will be used	110
54	Natural Language Procedure Text slide	Adult provided 2 to 3 options to child and provides appropriate play activity and verbal model and waits for child's response and continues the activity.	15
55	Advantages Text slide	It uses combination of natural and drill practices hence easy to learn. It increases child's motivation and monitoring skills. It increases child's use of targets and reduces problem behaviours. Generalization is targeted.	20
56	Treatment and Education of Autistic and related Communication Handicapped Children (TEACCH) Text slide	TEACCH is an educational intervention technique based on visual supports. It is useful for ASD of all age groups. Most of the children with ASD are visual learners hence TEACCH is helpful for them. Physical organization and scheduling are the important components of TEACCH	20
57	Components of TEACCH Text slide and visuals of components	Physical Organization, Scheduling, Work System, Task Organization are the components of TEACCH	10
58	Physical Organization Text slide and visuals of physical organization	Physical Organization refers to the actual layout and the area of teaching (classroom, home, or therapy room). The physical boundaries are clearly defined and usually include activities like: work, play, snack, and music etc.	20
59	Scheduling Text slide	A schedule is set up which indicates what the person is supposed to do and when it is supposed to happen. Children with ASD have problems with sequential memory and organization of time. The schedules for a day or week are clearly shown to the child through words, photographs, objects, or drawings.	30
60	Beginning schedule Text slide with visuals	This is an example of beginning schedule, where in we use only first and then. First one should be less preferred activity followed by more preferred activity.	15
61	Object Schedule	This includes sequence of objects necessary to complete	10

	Text slide with visuals	particular daily routine/ action	
62	Written/Picture Schedule Text slide with visuals	This includes sequence of written words and picture necessary for daily routine/ particular activity	10
63	Work System Text slide and visuals	This refers to the systematic and organized presentation of tasks/materials to be completed in independent work area. The goal is to teach the child to work independently. The work system is also organized in such a way that the child has little or no difficulty figuring out what to do (For example, the activity or task should be performed from top to bottom or from left to right). This is an example of work system, where in clinician arranges all the activities in order.	40
64	Task Organization Text slide with visuals followed by video	It is a part of work system. Tasks will be arranged separately to avoid confusion. This tells what needs to be done within a task	20
65	Text slide followed by the video	Physical Organization: Refers to Area, location, and number of access items in that area. Scheduling: Schedules should be clear, purposeful, and consistent. It helps in prediction and transition from one activity to other. The schedule tells you where to go and the sequence of activity.The work system tells you what to do in each session with respect to each activity	95

Appendix II

Development and Validation of Video Manual for Different Management Techniques in Children with Autism Spectrum Disorders

VIDEO FEEDBACK CHECKLIST

Name of the Speech Language Pathologist: Date:

Instructions: Please put a tick mark in the appropriate columns for each questions (1-poor, 2-average, 3-good) and write yes/no for last three questions.

Questions	1	2	3
A. Content and Presentation			
1. Do you think the titles and subtitles are appropriate?			
2. Do you think that the written text is visible?			
3. Do you think the information provided is sufficient?			
4. Do you think the content of the video is accurate and relevant?			
5. Do you think the vocabulary/language is appropriate for the user?			
6. Do you think the narration is adequate?			
7. Do you think the presentation of the video is well structured and organized?			
8. Do you think the procedures of all the management techniques are appropriate?			
9. Do you think the scripts of all the management techniques are appropriate?			
B. Audio and video characteristics			
10. Do you think the overall audio-visual presentation is good?			
11. Do you think the quality of audio is good?			
12. Do you think the quality of video is good?			
13. Do you think the editing of both audio and video is good?			
14. Do you think the audio and video are in harmony?			
15. Do you think the length of the video is too long? (yes/no)			
16. Do you think the length of the video is too short? (yes/no)			
17. Did you enjoy the video? (yes/no)			

How would you rate the overall video module? (1-poor 2-average 3-good)

If rating is (1) or (2), give your suggestions to improve video module.

Do you have any other suggestions about the video content, presentation and audio-video characteristics?

Do you have any suggestions in the video feedback checklist?

Appendix III

Development and Validation of Video Manual for Different Management Techniques in Children with Autism Spectrum Disorders

VIDEO EVALUATION QUESTIONNAIRE

Name of the Student/Parent: Date:

Instructions: Please read the following statements and state true or false.

	True	False
Introduction		
1) The difficulties in communication, social interaction and poor mental abilities are the triad of symptoms in Autism Spectrum Disorders.		
2) All the management techniques of Autism Spectrum Disorders are based on behavioral principles**.**		
3) Children with Autism Spectrum Disorders show poor listening and speaking skills.		
4) A child with Autism Spectrum Disorder does not need intensive teaching session.		
5) The management techniques for other communication disorders can be adapted for the management of Autism Spectrum Disorders.		
6) Autism Spectrum Disorders is also known as Pervasive Developmental Disorders.		
7) Class room based approach is a treatment approach for children with Autism Spectrum Disorders.		
8) The children with Autism Spectrum Disorders respond equally to all management techniques.		
9) The specific characteristics in Autism Spectrum Disorders differ in terms of quantity and quality.		
10) According to DSM IV, the Autism Spectrum Disorders include five subgroups.		
Discrete Trial Training (DTT)		
11) DTT breaks down learning units into simple units.		
12) Constant instructions should be used in initial stages of DTT.		
13) Periodic change of reinforcement increases child's response.		
14) Mass trial includes presentation of combination of related and unrelated tasks.		
15) Mixed trial is rote and easy to learn for most of children with Autism Spectrum Disorders.		
Applied behavior Analysis (ABA)		
16) Antecedent Behavior and Consequence (ABC) is a term used in Applied Behavior Analysis.		
17) Antecedence increases or decreases the frequency of behavior.		

18) Positive reinforcement increases the behavior on providing the desired item. 19) Negative reinforcement decreases the behavior on providing the desired item. 20) The generalization is not a part of ABA program. ***Picture Exchange Communication System (PECS)*** 21) PECS is a behavioral technique, in which communication is carried out through picture exchange. 22) In the initial stages child learns the picture exchange communication through two person prompting. 23) PECS is not beneficial for verbal children with Autism Spectrum Disorders. 24) PECS improves requesting, answering, and commenting skills in children with Autism Spectrum Disorders. 25) Discrimination activities start with equally preferred items. ***Enhanced Milieu Teaching (EMT)*** 26) The adult should be an engaging responsive partner during EMT 27) Time delay is the procedure in which adult pause and waits for child's spontaneous response. 28) EMT uses drill practice of the target items. 29) Mand model consist of a question followed by a pause. 30) Teaching a child from immediate natural context is called incidental teaching. ***Pivotal Response Training (PRT)*** 31) PRT targets only one behavior at a time in children with Autism Spectrum Disorder. 32) PRT starts with neutral items and move on to preferred items 33) PRT focus on pivotal areas of child's development 34) In PRT Natural reinforcements are provided to children 35) Child choose activity and reinforcements options in PRT ***Treatment and Education of Autistic and related Communication Handicapped Children (TEACCH)*** 36) TEACCH is an educational intervention technique for children with ASD 37) Physical organization is the arrangement of activities for each session 38) Physical organization and scheduling are component of TEACCH 39) Schedules include the sequence of activity list with respect to time 40) Work system includes physical arrangement of different areas.		