PERCEPTION OF PARENTS IN USING VIDEO MODELLING TO IMPROVE SELF-HELP SKILLS OF CHILDREN WITH AUTISM SPECTRUM DISORDER

Aman NA[1], Hanifah INA[1], Ilias K[2], Hayasaka T[3], Nordin S[4] and Che Daud AZ[1, 5].

[1]Centre for Occupational Therapy Studies, Faculty of Health Sciences, Universiti Teknologi MARA, 42300 Puncak Alam, Selangor, Malaysia

[2]Department of Basic Science, Faculty of Health Sciences, Universiti Teknologi MARA, 42300 Puncak Alam, Selangor, Malaysia

[3]Department of Occupational Therapy, Faculty of Health and Sciences, Kyorin University, Tokyo 181-8612, Japan

[4]College of Computing, Informatics and Media, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia

[5]Special Population Research, Innovation & Knowledge (SPaRK), Faculty of Health Sciences, Universiti Teknologi MARA, 42300 Puncak Alam, Selangor, Malaysia

Correspondence:

Ahmad Zamir Che Daud,
Centre for Occupational Therapy Studies,
Faculty of Health Sciences, Universiti Teknologi MARA
42300 Puncak Alam, Selangor, Malaysia
Email: zamir5853@uitm.edu.my

Abstract

Over the past 20 years, there has been a noticeable increase in the prevalence of autism spectrum disorder (ASD) because of the change in diagnostic criteria, policy and increased awareness. One of the issues that children with ASD have in their life is self-help skills. This triggers the need to adopt a proper technique to intervene and teach new skills to children with ASD. Video modelling (VM) is one of the intervention methods that can be done with children with ASD as one of parent-mediated interventions (PMI). The objective of this study was to investigate the self-help skills problems among children with ASD and parents' perception of using VM to improve self-help skills in children with ASD. Associations of the child's and parent's demographic characteristics with self-help skills problems and perception of parents in using VM were also examined. A cross-sectional study using purposive sampling that included 262 parents of children with ASD was employed. Questionnaires that include demographic characteristics, Vineland Adaptive Behaviour Scale Third Edition (VABS-3) and Video Modelling Perceptions Scale (VMPS) were completed by the participants. There were significant differences between the age of children with ASD ($p < 0.001$) with self-help skills problems. Educational level ($p < 0.001$), occupation sector ($p < 0.001$) and household income status ($p < 0.001$) were associated with parents' perceived interest and accessibility in using VM. In conclusion, parents showed positive responses about their perceived interest and accessibility in using VM to improve self-help skills in children with ASD.

Keywords*:* Autism Spectrum Disorder, Perception, Self-Help Skills, Video Modelling, Parent-Mediated Intervention

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by persistent (i) difficulties in social communication and (ii) restricted, repetitive and sensory behaviour or interest (1). ASD is a permanent developmental disorder that can impair and restrict a person's daily functioning (1). Children with ASD experience problems performing self-help skills independently, which profoundly impacts the other areas of development such as social interaction, recreation and leisure, community participation, and employment (2). Self-help skills are defined as 16 daily living skills which include beginning to eat, cooperating in dressing and washing, beginning to drink, using a spoon and fork, removing clothing, toilet training, cleaning hands and face, putting on clothes and shoes, hygiene, fastening fasteners, bathing, using the bathroom, using knives when eating, eating and exercise choices, preparing for weather and health care (3). To overcome these problems, parents can be active mediators in the therapeutic process by receiving adequate training and ongoing coaching, which allow them to give interventions to their children more efficiently (4).

Parent-mediated intervention (PMI) is a treatment that involves a combination of commitment of the parents and children. Qualified therapists will educate, teach, and coach the parents or caregivers to maximize children's learning through more opportunities to practice the skills across various settings (5). PMI is progressively

being used to focus on core deficits associated with children with ASD such as functional life skills, challenging behaviour and academic functioning (6). However, there are several challenges, including a lack of parental time, energy, resources, sustainability issues, and a higher degree of stress (6). Therefore, perceptions of parents on intervention techniques used must be explored to ensure the willingness of parents to implement the intervention with their children.

One of the common mediums that are being used in PMI is video modelling (VM) (7). VM proposes that learning will occur when children observe a certain behaviour through a video that represents the targeted behaviour (e.g., social, motor, self-monitoring, communication, vocational, play, emotional, and adaptive skills) and they will imitate the behaviour they observe (8). Basic VM, video self-modelling, point-of-view VM and video prompting are some of the most popular types of VM (9). There is strong evidence that supports the use of VM in teaching different skills to children with ASD such as social communication and functional living skills (10). VM training demonstrated success in helping children with ASD to accomplish many tasks in daily life such as functional living skills, play and food selectivity (7, 11-14). Therefore, the objective of this study is to investigate parents' perceived interest and accessibility in using VM to improve self-help skills of children with ASD using video modelling perceptions scale (VMPS). Associations of demographic characteristics with self-help skills problems and the perception of parents in using VM were also explored.

Materials and Methods

Design

A cross-sectional study was conducted at Community-Based Rehabilitation (CBR) centres and the National Autism Society of Malaysia (NASOM) in the east, northern, south and central regions of Malaysia. It is an observational study in which data from a population is analysed at a specific point in time (15). Participants were recruited from December 2021 to May 2022. It is frequently used to assess health outcomes prevalence, comprehend the health factors, and describe demographic characteristics (15). This study design allowed researchers to examine self-help skills problems among children with ASD and the perception of parents in using VM. Ethical approval from Universiti Teknologi Mara (UiTM) Research Ethics Committee was obtained before conducting the study (Approval no.: REC/11/2021/(MR/848).

Samples and sampling strategy

Sample size calculation was done and this study needed 384 participants to achieve a reliability level of 95% with 0.05 margin error. However, only 262 participants participated in this study. Through the purposive sampling method, participants were chosen based on the pre-set inclusion and exclusion criteria. Participants were recruited based on the following inclusion criteria parents or caregivers of children: (i) with ASD aged from three to nine years; with ASD whose children were currently undergoing treatment from Community-Based Rehabilitation (CBR) centres and National Autism Society of Malaysia (NASOM) in Malaysia; (iii) primary caregivers; (iv) educational level of at least high school to be able to understand and complete the questionnaire. Participants were excluded if their children had comorbid conditions such as neurological impairment and other congenital problems.

Materials and instruments

Participants were asked to complete three questionnaires that include demographic characteristics, Vineland Adaptive Behaviour Scale Third Edition (VABS-3) and Video Modelling Perceptions Scale (VMPS). Demographic characteristics questionnaire was used to gather demographic information of the participants such as age, gender, educational level, occupation sector and income status (MYR).

VABS-3 (parent/caregiver form) was used to measure the adaptive behaviour of children with ASD (3). It consists of four domains; 1) communication such as receptive, expressive, and written; 2) daily living skills such as personal, domestic and community; 3) socialization such as interpersonal relationships, play and leisure and coping skills; and (4) motor skills such as gross motor and fine motor. For this study, only the daily living skills domain will be rated. Parent/caregiver will respond to each item using a 3-point Likert scale that indicates the independency level of their child (0 = never performs the skills independently, 1 = sometimes performs skills independently and 2 = usually performs skills independently). VABS-3 had internal consistency ranging from 0.90 to 0.99 for all Comprehensive Form domains and 0.86 to 0.97 for all Domain-Level Form domains (3). While for the test-retest reliability, r values ranged from 0.79 to 0.93 across all ages and 0.74 to 0.90 for all Domain-Level domains (3).

Perception of parents towards the use of VM was measured using VMPS that is developed by Cardon et al. (16). It comprised 11 items that reflected the supposed strengths and disadvantages of VM as depicted in professional literature, as well as other potential barriers to more extensive use (16). VMPS consists of 2 factors: Factor 1 and Factor 2. Factor 1 has 7 items associated with perceptions of caregivers on their interest in using VM as an intervention medium and Factor 2 has 4 items related to perceptions of caregivers on the accessibility of VM as an intervention medium (16). Caregivers will respond to each item using a 5-point Likert scales that show the degree of their agreement or disagreement (1 = agree completely to 5 = disagree completely) (16). Internal consistency of Factor 1 is 0.83 and Factor 2 is 0.62 and 0.73 for all the 11 items in VMPS. These suggested that the scale factors are measuring the specific concepts consistently (16).

Data collection procedure

Potential participants were screened based on inclusion and exclusion criteria that have been set. Study procedures

were explained and if the participants are willing to participate in this study, consent forms were completed. Then, demographic questionnaires, VABS-3 and VMPS were given to the participants to be completed via Google Forms. Questionnaires that had been completed were prepared for data entry and analysis.

Data analysis

All data were statistically analysed using Statistical Package for Social Science (SPSS) version 25.0 software. Demographic characteristics of participants, self-help skills problems among children with ASD and parents' perceived interest and accessibility in using VM were analysed using the descriptive statistic while for the associations of demographic characteristics with self-help skills and perception of parents in using VM, either independent t-test or one-way ANOVA were used depending on the numbers of variables involved during the data analysis process.

Results

Demographic characteristics of participants

A total of 262 participants were recruited for this study. Most of the participants were female (n = 220, 84.0%) and their ages ranged from 31 to 40 years old (n = 163, 62.2%). The majority of parents were from college or university (n = 212, 80.9%) followed by secondary school (n = 35, 13.4%), primary school (n = 8, 3.1%) and no formal education (n = 7, 2.7%). Participants were mostly unemployed or housewives (n = 96, 36.6%), self-employed (n = 56, 21.4%), private staff (n = 56, 21.4%) and government servants (n = 54, 20.6%). Most of the participants' household income status was less than RM4,850 per month (n = 146, 55.7%) followed by household income between RM4,851 and RM10,970 per month (n = 106, 40.5%) and exceeding RM10,971 per month (n = 10, 3.8%). The demographic characteristics of the participants were summarized in Table 1.

Table 1: Demographic characteristics of participants (N = 256)

Demographic characteristics	N	%
Children's gender		
Male	202	77.1
Female	60	22.9
Children's age		
3 – 6 years old	149	56.9
7 – 9 years old	113	43.1
Parents' gender		
Male	42	16.0
Female	220	84.0
Parents' age		
≤ 30 years old	52	19.8
31 - 40 years old	163	62.2
41 - 50 years old	47	17.9
Parents' educational level		
No formal education	7	2.7
Primary school	8	3.1
Secondary school	35	13.4
College / University	212	80.9
Occupation sector		
Government	54	20.6
Private	56	21.4
Self-employed	56	21.4
Unemployed / Housewife	96	36.6
Household income		
Less than RM 4, 850 per month	146	55.7
RM 4,851 to RM 10, 970 per month	106	40.5
Exceeds RM 10,971 per month	10	3.8

Self-help skills problems among children with ASD

Self-help skills problems among children with ASD were measured using VABS-3. Based on the findings, the most common self-help skills problems among children with ASD were 'understand the right to vote' (93.5%), 'knows how to make an emergency call' (92.4%), 'sets a goal requiring six months and achieves it' (91.6%), 'uses the stove or oven for cooking or baking' (88.2%), 'understands signs/ symbols used to indicate danger' (78.6%), 'checks change from purchases for correctness' (76.7%), 'understands and follows community rules and laws' (76.0%), 'talks with a familiar person using a phone, etc.' (75.2%), 'takes his own temperature when needed' (74.0%), and 'secures the home against intruders when leaving' (73.7%). Table 2 showed the self-help skills problems among children with ASD. Data were arranged from the most to the least common self-help skills problems among children with ASD.

Table 2: Self-help skills problems among children with ASD

Items	Performing skills independently, n (%)		
	Never	Sometimes	Usually,
Understands the right to vote	245 (93.5)	17 (6.5)	0 (0.0)
Knows how to make an emergency call	242 (92.4)	19 (7.3)	1 (0.4)
Sets a goal requiring six months and achieves it	240 (91.6)	20 (7.6)	2 (0.8)

Table 2: Self-help skills problems among children with ASD (Continued)

Items	Performing skills independently, n (%)		
	Never	Sometimes	Usually,
Uses the stove or oven for cooking or baking	231 (88.2)	28 (10.7)	3 (1.1)
Understands signs/ symbols used to indicate danger	206 (78.6)	47 (17.9)	9 (3.4)
Checks change from purchases for correctness	201 (76.7)	39 (14.9)	22 (8.4)
Understands and follows community rules and laws	199 (76.0)	58 (22.1)	5 (1.9)
Talks with a familiar person using a phone, etc.	197 (75.2)	52 (19.8)	13 (5.0)
Takes his own temperature when needed	194 (74.0)	47 (17.9)	21 (8.0)
Secures the home against intruders when leaving	193 (73.7)	56 (21.4)	13 (5.0)
Sets a short-term goal and achieves it	193 (73.7)	59 (22.5)	10 (3.8)
Shows awareness that exercise is good for people	189 (72.1)	64 (24.4)	9 (3.4)
Makes small purchases at a store	187 (71.4)	53 (20.2)	22 (8.4)
Makes healthy eating choices	182 (69.5)	69 (26.3)	11 (4.2)
Carries or stores money/ payment cards securely	179 (68.3)	56 (21.4)	27 (10.3)
Knows what to do in dangerous situations	178 (67.9)	76 (29.0)	8 (3.1)
Combines coins to equal a specific amount	178 (67.9)	55 (21.0)	29 (11.1)
Is careful when using sharp objects	163 (62.2)	72 (27.5)	27 (10.3)
Is careful around hot objects	158 (60.3)	64 (24.4)	40 (15.3)
Covers mouth and nose when coughing or sneezing	158 (60.3)	81 (30.9)	23 (8.8)
Prepares a simple snack or meal	153 (58.4)	78 (29.8)	31 (11.8)
Uses household appliances/equipment carefully	150 (57.3)	88 (33.6)	24 (9.2)
Uses at least two social interaction technologies	139 (53.1)	98 (37.4)	25 (9.5)
Washes fruits/ vegetables before eating or cooking	126 (48.1)	90 (34.4)	46 (17.6)

Table 2: Self-help skills problems among children with ASD (Continued)

Items	Performing skills independently, n (%)		
	Never	Sometimes	Usually,
Puts his clean clothes away where they belong	116 (44.3)	81 (30.9)	65 (24.8)
Uses household products correctly	111 (42.4)	118 (45.0)	33 (12.6)
Uses the toilet when needed without help	110 (42.0)	82 (31.3)	70 (26.7)
Stays near parent/ caregiver when in public places	105 (40.1)	92 (35.1)	65 (24.8)
Understands that money is used to buy things	100 (38.2)	76 (29.0)	86 (32.8)
Bathes or showers and dries himself	92 (35.1)	107 (40.8)	63 (24.0)
Defecates in a toilet or potty chair	88 (33.6)	71 (27.1)	103 (39.3)
Acts safely when working and/or having fun	88 (33.6)	132 (50.4)	42 (16.0)
Puts dirty clothes in the proper place to be washed	79 (30.2)	88 (33.6)	95 (36.3)
Urinates in a toilet or potty chair	78 (29.8)	75 (28.6)	109 (41.6)
Uses at least two simple kitchen appliances	73 (27.9)	118 (45.0)	71 (27.1)
Cuts easy-to-cut food with a table knife	65 (24.8)	87 (33.2)	110 (42.0)
Puts leftover food away	64 (24.4)	102 (38.9)	96 (36.6)
Puts clothing on right side forward/correct side out	53 (20.2)	118 (45.0)	91 (34.7)
Puts shoes on the correct feet and ties or fastens	48 (18.3)	118 (45.0)	96 (36.6)
Wipes up his own spills	36 (13.7)	110 (42.0)	116 (44.3)
Washes and dries his hands	32 (12.2)	97 (37.0)	133 (50.8)
Takes off or wipes dirty shoes before going inside	31 (11.8)	108 (41.2)	123 (46.9)
Brushes his teeth	20 (7.6)	78 (29.8)	164 (62.6)
Feeds himself with a spoon without spilling	8 (3.1)	72 (27.5)	182 (69.5)
Drinks from a regular cup or glass without spilling	6 (2.3)	55 (21.0)	201 (76.7)

Parents' perceived interest and accessibility in using VM

VMPS was used to measure parents' perception towards using VM. The mean score of VMPS (1.65 ± 0.49) showed that all parents of children with ASD were interested and had access to using VM as an intervention medium. They are interested and willing to learn more about VM. They also believed that VM will enhance their children's skills.

Association between demographic characteristics of children with ASD and self-help skills problems

Independent t-test was conducted to investigate the association between demographic characteristics (gender and age) of children with ASD and self-help skills problems. It showed that there was no significant difference in self-help skills problems in female children (M = 1.71, SD = 0.43) and male children (M = 1.71, SD = 0.39), t (260) = -0.07, p = 0.94. However, there was a significant difference in self-help skills problems in 3 – 6 years old (M = 1.53, SD = 0.32) and 7 – 9 years old (M = 1.96, SD = 0.38), t (260) = -9.71, p = 0.00. Therefore, the self-help skills problems among children with ASD were not associated with gender but associated with the age of children with ASD. Table 3 summarized the results of the association.

Table 3: Association between demographic characteristics of children with ASD and self-help skills problems

Demographic characteristics	Mean ± SD	t-stats (df)	Mean diff. (95% CI)	P-value
Children's gender				
Male	1.71 ± 0.39	-0.07 (260)	-0.004 (-0.12, 0.11)	0.94
Female	1.71 ± 0.43			
Children's age				
3 – 6 years old	1.53 ± 0.32	-9.71 (260)	-0.42 (-0.51, -0.34)	0.00
7 – 9 years old	1.96 ± 0.38			

Association between demographic characteristics of the parents and perceived interest and accessibility in using VM

Independent t-test was conducted to investigate the association between the gender of parents and their perceived interest and accessibility in using VM. It showed that there was no significant difference in VABS scores in females (M = 1.62, SD = 0.43) than scores in males (M = 1.82, SD=0.67), t (260) = -1.86, p = 0.06. Therefore, perceived interest and accessibility in using VM are not associated with the gender of parents.

One-way ANOVA was used to investigate the association between the demographic characteristics of parents and their perceived interest and accessibility in using VM. Table 4 showed there was no significant association between the age of parents and their perceived interest and accessibility in using VM. However, for other demographic characteristics (educational level, occupation sector and household income status), there were significant differences in the perceived interest and accessibility in using VM. Therefore, perceived interest and accessibility in using VM can be said to be influenced by the demographic characteristics (educational level, occupation sector and household income status) of parents.

Table 4: Association between demographic characteristics of parents and their perceived interest and accessibility in using VM

Demographic characteristics	N	Mean ± SD	F-stats (df)	P-value
Parents' age				
≤ 30 years old	52	1.74 ± 0.57	1.13 (2; 259)	0.32
31 - 40 years old	163	1.62 ± 0.45		
41 - 50 years old	47	1.66 ± 0.50		
Parents' educational level				
No formal education	7	1.44 ± 0.33	8.95 (3; 258)	<0.001
Primary school	8	1.43 ± 0.26		
Secondary school	35	1.31 ± 0.26		
College / University	212	1.72 ± 0.49		
Occupation sector				
Government	54	1.99 ± 0.45	31.23 (3; 258)	<0.001
Private	56	1.90 ± 0.47		
Self-employed	56	1.42 ± 0.40		
Unemployed / Housewife	96	1.45 ± 0.37		
Household income (per month)				
Less than RM 4, 850	146	1.44 ± 0.44	43.74 (2; 259)	<0.001
RM 4,851 to RM 10, 970	106	1.90 ± 0.39		
Exceeds RM 10,971	10	2.10 ± 0.40		

Discussion

The objective of this study was to investigate the self-help skills problems among children with ASD. It is found that based on VABS-3, the most common self-help skills

problem among children with ASD is 'understand the right to vote' while the least common problem is 'drinks from a regular cup or glass without spilling'. A study showed that 56.4% of adolescents with ASD had deficits in self-help skills such as beginning to eat, cooperating in dressing and washing, beginning to drink, using a spoon and fork, removing clothing, toilet training, cleaning hands and face, putting on clothes and shoes, hygiene, fastening fasteners, bathing, using the bathroom, using knives when eating, eating and exercise choices, preparing for weather and health care (17). Based on a systematic review of 15 studies on individuals with ASD, it is found that 50% of them are highly dependent with little social interactions (18). This is consistent with the study done by Cruz-Torres et al. (19) in which adolescents and adults with ASD have a low level of independency and face difficulty in performing self-help skills.

This study found that the gender of children was not associated with self-help skills problems in children with ASD. Pellecchia et al. (20) also stated that the few studies that include demographic variables have found no significant differences in outcomes associated with sex or ethnicity. However, self-help skill problem in children was found to be associated with the age of children with ASD. According to Case-Smith and O'Brien (21), younger children often show growth in simple actions as their minds keep developing, which normally means that the abilities established in toddlers are prerequisites to the skills built upon by kids at the preschool level. Although children acquire abilities over varying lengths of time and in varying sequences, most children develop in a natural progression within the same age ranges.

To make sure the interventions that are carried out through PMI are effective, parents' perceptions of intervention techniques used must be explored to enhance the effectiveness. Most of the parents showed a positive response about their interest in using VM as PMI and they also showed their agreement about the barriers that may impede their accessibility in using VM such as expenses, time, and their computer and technical abilities. Callahan et. al (22) stated that caregivers viewed VM as a very important instructional tool. Similarly, Cardon (23) found that caregivers were interested in using VM to support their children's daily living routines but lacked knowledge on how to do so. These findings were also supported by Cardon et al. (16) that caregivers had positive perceptions of VM, and their interest in using it increased with experience. Those who showed interest in VM also believed that their children would benefit from it. Other than that, caregivers also identified important potential barriers to VM implementation (e.g., unavailability of technology, confusion surrounding technology use, and a lack of explicit training protocols) (16).

This study indicated that the gender and age of parents were not associated with parents' perceived interest and accessibility in using VM. Cardon et al. (16) proved that regardless of children's age, caregivers perceived VM as a beneficial intervention tool. This may be because parents believed that many children nowadays have shown great interest in using gadgets or smart technologies regardless of their age. Visual aids also help children with ASD comprehend concepts easily (24, 25).

Meanwhile, the educational level of parents was associated with their perceived interest and accessibility in using VM. Higher educational levels showed a significant increase in interest and accessibility in using VM. The result of this study was consistent with the previous study by Cardon et al. (16), it is reported that caregiver's education was associated with perceptions of VM accessibility. It is possible that caregivers with higher education levels can access relevant information and tools more readily (16). Other than that, Adhe et al. (26) stated that parents who have received their education in higher institutions would have different levels of awareness than parents who have received their education in primary and secondary schools.

Aside from that, these findings also suggested that the occupation sector of parents and household income status was associated with their perceived interest and accessibility in using VM. Parents of lower socioeconomic status are less likely to enrol or engage in parenting programs compared to higher socioeconomic status parents (27). This result contrasts with the finding from Cardon et al. (16) that stated caregivers' responses were not associated with their income levels. They showed interest and positive perceptions of VM accessibility regardless of their income levels (16).

Implications of study

There were limited studies about parents' perceptions and accessibility in using VM, especially in Malaysia. Thus, this study adds a significant contribution to filling the current gaps in the literature regarding parents' perception and accessibility in using VM to improve self-help skills of children with ASD in Malaysia. Through the result made by this study, policymakers and healthcare professionals will have a new approach to how to widen the accessibility of treatment through the use of technology and the involvement of parents/caregivers in the intervention plan and implementation.

Limitations of study

Several limitations were identified in this study. First, this study did not achieve the required sample size to generalise the results to the wider population. A larger sample size ensures better outcomes and generalization of findings. Moreover, the severity of children with ASD was not identified in this study. The severity of the condition can influence the degree of self-help skills problems in children with ASD.

Conclusion

In conclusion, this study showed that most children with ASD have problems with self-help skills that affect

their independence in everyday life. Most of the parents also showed positive responses about their interest and accessibility in using VM as a part of PMI to improve self-help skills in children with ASD. Perceived interest and accessibility in using VM can be said to be influenced by the demographic characteristics (e.g.; educational level, occupation sector and household income status) of parents.

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Competing interests

The authors declare that they have no competing interests.

Ethical Clearance

Ethical approval from the Universiti Teknologi Mara (UiTM) was obtained to conduct this study (Approval no.: REC/11/2021/(MR/848).

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