International Journal of Public Health Science (IJPHS)
Vol. 13, No. 3, September 2024, pp. 1136~1144
ISSN: 2252-8806, DOI: 10.11591/ijphs.v13i3.23707

The use of video-based interventions to teach activity of daily living to children with autism spectrum disorder–scoping review

Nurul Khairani Ismail[1], Hasrul Hosshan[1,2], Nurbieta Abd Aziz[1], Abdul Halim Masnan[1,2], Norsayyidatina Che Rozubi[1], Mohd Muslim Md Zalli[1], Siti Roshaidai Mohd Arifin[3]
[1]Faculty of Human Development, Sultan Idris Education University, Tanjong Malim, Perak, Malaysia
[2]National Child Development Research Centre, Tanjong Malim, Perak, Malaysia
[3]Kuliyyah of Nursing, International Islamic University Malaysia, Kuantan, Pahang, Malaysia

Article Info

Article history:

Received Aug 2, 2023
Revised Dec 13, 2023
Accepted Jan 30, 2024

Keywords:

Activity daily living
Children with ASD
Implementation support
Scoping review
Video-based intervention

ABSTRACT

The study aimed to delve into the successful implementation of Video-Based Intervention (VBI) in improving activity of daily living skills (ADL) among children with autism spectrum disorder (ASD). Three primary electronic databases were utilised to perform this review: WOS, Scopus and Google Scholar. The process primarily used the research methodologies by Arksey and O'Malley as a framework. In the course of performing the scoping review, three themes emerged: firstly, a wide range of VBI techniques can be employed to enhance the skills of children with ASD; secondly, when VBI is coupled with adequate implementation support specifically tailored for children with ASD, it can effectively improve their daily living abilities. Essentially, the findings of this study support that VBI implementations can promote desired skills in ADL among children with ASD. Furthermore, additional implementation support complements video modeling, improving skill acquisition in ASD. This research enhances the existing knowledge base dedicated to enhancing the quality of life for children with ASD, providing valuable insights for educators, clinicians, and families involved in their care.

Corresponding Author:

Hasrul Hosshan
Faculty of Human Development, Sultan Idris Education University
35900 Tanjong Malim, Perak Darul Ridzuan, Malaysia
Email: hasrul.hosshan@fpm.edu.my

1. INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental disorder that affects speech, behaviour, and social skills and usually appears in infancy [1]. ASD is estimated to be 1.6 per 1,000 children in Malaysia [2] and 14.7 per 1,000 eight-year-olds in the US, indicating a growing tendency [3]. ASD children benefit from early intervention. Human brain development after birth depends on genetic programming and extrinsic events [4], [5]. The highest neuroplastic phase is birth to age three due to fast synapse development [5], [6]. Early detection and management improve cognitive and behavioural results compared to later diagnoses [6], [7]. Early diagnosis improves preschool verbal and general cognition, boosts inclusive classroom enrollment, and minimises the need for continued care [4], [6], [7]. Early diagnosis also enables early intervention, improving results [4], [6]. Children with ASD's quality of life can be significantly enhanced with activity daily living (ADL) intervention, which is crucial to independence [8]. To guarantee effective intervention, addressing numerous parts of their everyday lives and prioritising skills based on their final functioning can assist in choosing the best objectives [9], [10].

Video-based interventions (VBI) draw inspiration from Albert Bandura's social learning theory, utilising video models to facilitate skill acquisition [11]. Bandura emphasised that children learn by observing

and imitating behaviour and have the potential to be intrinsically motivating and captivating [12]. Within the context of ASD, children frequently demonstrate superior visual perception, enabling them to process visual information more rapidly than auditory stimuli [13]. Thus, visual information is a preferred learning strategy for this target group [14]. Video modelling interventions encompass various approaches, including video modeling (VM), video self-modeling (VSM), point-of-view modeling (POV), video prompting (VP), video feedback (VF), and computer-based video instruction (CBI) [15].

Video modelling (VM) offers several practical advantages, such as it can targeting a wide range of skills and standardising training protocols [16], [17]. Furthermore, VM promotes generalisation from training by showing the skills in natural settings rather than simulated ones [18]. The accessibility of portable devices like mobile phones and tablets allows videos to be viewed anytime and anywhere [17]. Video models also enable children with ASD to repeatedly perform behaviours accurately, facilitating learning of desired actions with minimal modifications [19]. Video modeling effectively influences behavior and skill acquisition across a spectrum of domains, including social interaction, perspective-taking, play, self-help tasks, and academics [14], [20], [21]. However, some argue that VBIs may be ineffective, especially for children who struggle with imitation [22], [23]. Thus, to ensure successful VBI outcomes, pre-intervention imitation skill intervention should be carried out [23], [24]. Despite some attempts to review video modelling for personal care skills in children with ASD, limited focus has been placed on specific age groups, particularly early childhood. Thus, the present study aims to conduct a rigorous scoping review to explore existing literature and address the implementation of VBI in teaching ADL to children with ASD, focusing on two research questions: a) What kinds of VBI can be applied to teach ADL to children with ASD? b) What appropriate implementation supports can be used to improve ADL in children with ASD?

2. METHOD

2.1. Research design

A scoping review was used to learn how VBI can enhance ADL for children with ASD. This method methodically reviews domain-specific literature to help grasp the topic [25], [26]. Scoping reviews are essential for examining specific fields' breadth and depth [25] but do not require thoroughly analysing the evaluated papers' methods and results [25]–[27]. This study chose the [25] methodological framework to examine the depth, breadth, and features of literature on VBI's implementation in boosting ADL for children with ASD. However, the study won't detail the conclusions, but this study helped visualise the vast amount of relevant materials on this fascinating topic [25]. As indicated by [28], this study examined each stage of [25] methodological approach and suggested improvements. Summary of the steps taken in this study Figure 1.

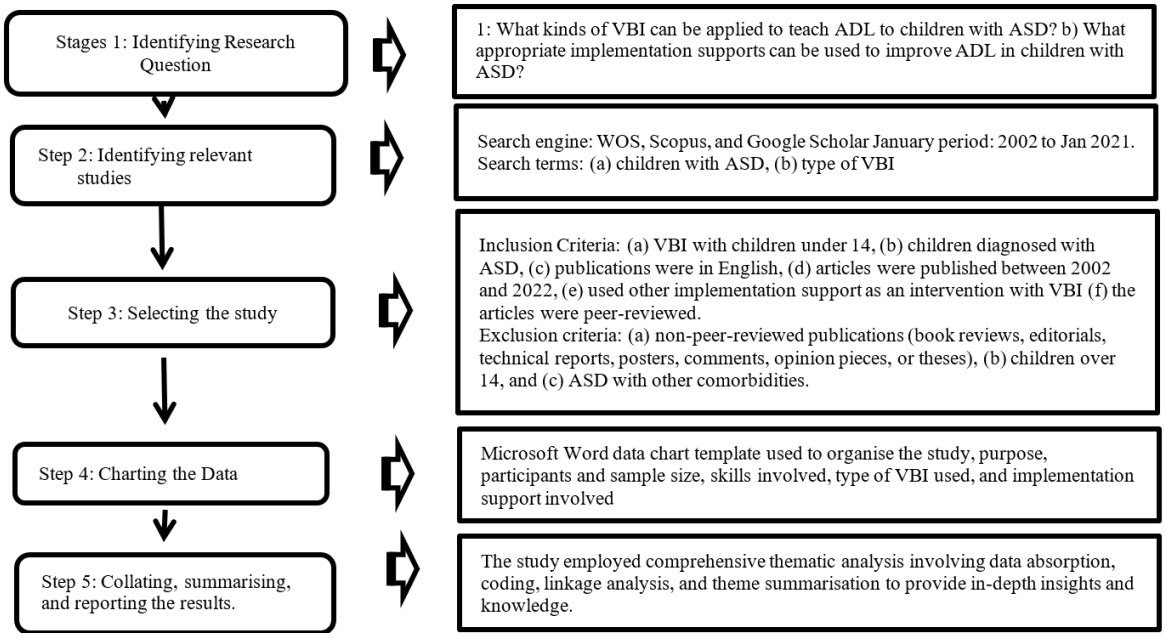

Figure 1. Arksey and O'Malley's framework stages for conducting a scoping review

3. FINDINGS

The initial search yielded 636 articles, with four duplicates removed. After reviewing the titles and abstracts, certain articles were excluded, and the remaining ones were subjected to a full-text evaluation. During the evaluation process, another 566 articles were removed from the evaluation because they did not match the inclusion criteria. 66 full-text articles were assessed, and after proper title screening, abstract screening, and content screening, only nine articles were included in the review. The selected articles' summarization processes are visually presented in Figure 2.

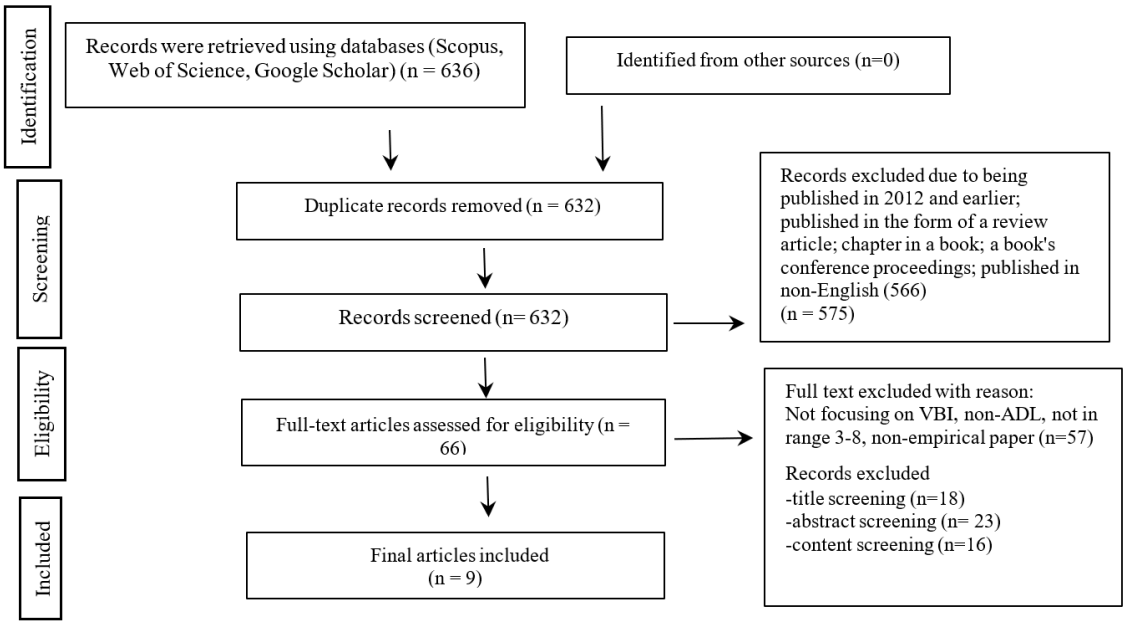

Figure 2. Articles selection processes using PRISMA Flow Diagram

3.1. Participants' background and skills involved

The studies highlight the effectiveness of VBI in improving ADL in children with ASD across various ages and settings. [29] teach multiple skills, such as making orange juice and table setting to three 5-year-old children with ASD, [30] focused on teaching hand-washing skills to three boys aged 3 to 5 in a school setting, [31] taught meal preparation to a 4-year-old boy with ASD in his home setting, [32] worked with 8 school-aged children to improve various daily living skills using point-of-view video modelling with an iPad, [33] enhanced oral hygiene practices in 18 children in a home setting [34] and [35] taught toileting skills to boys with ASD using video self-modelling and point-of-view modelling with various forms of reinforcement, [36] taught toilet training skills to a 4-year-old boy with ASD using video modelling in a home setting. Finally, a study [37] conducted at home with three 5-year-old children taught shoe-tying using video prompting and backward chaining. The children received verbal praise and physical rewards as positive reinforcement during the training.

3.2. Various kinds of VBI can be applied to enhance children's skills

Research shows that VBI enables ASD children to improve functional daily abilities. Customised video modelling interventions helped children with ASD gain skills in all three domains, even after the post-video phase and 1-month follow-up [30]. Additionally, iPad point-of-view video modelling can improve task performance over six weeks in children with ASD by teaching self-help skills [32], [31] utilised point-of-view video modelling to teach 4-year-old children how to prepare and serve himself Weetbix and clean up afterwards. The skill was subsequently transferred to various foods and situations.

Video modelling enhanced plaque index scores by blind clinical examiners at baseline, midpoint, and endpoint for ASD children in an oral hygiene trial [33], [34] discovered that video self-modelling and point-of-view modelling helped ASD children learn toileting. These were kept for four weeks and moved. Video self-modelling and point-of-view modelling helped boys with ASD learn toileting skills, which they kept 3-4 months later [35]. Video modelling helped [36] educate dressing, toileting, and flushing. Study in [37] used video prompting techniques to teach children how to tie their shoes and found that they retained the knowledge even a

week later. Another research [29] used instructional video modelling to educate children with ASD on how to make orange juice, prepare a letter for sending, and clean a fishbowl. Overall, instructional video modelling improved skill acquisition in all four categories beyond the post-video phase and 1-month follow-up.

The findings suggest that internet-based interventions can be a promising approach to improving oral hygiene outcomes in children with ASD [33]. The studies showed improvements in oral hygiene outcomes in both the intervention and control groups, with larger effect sizes observed in the intervention group. This suggests that internet-based interventions can effectively improve oral hygiene outcomes in children with ASD and may be an alternative approach to traditional intervention methods. The studies showed that intervention packages could effectively teach functional skills to children with ASD. The intervention packages effectively taught the behaviours necessary for successful and independent toileting, dressing, sitting on the toilet, and flushing. Furthermore, the skills generalised to other settings and were maintained for several months [34], [35]. This suggests that intervention packages can effectively teach functional skills to children with ASD. Table 1 summarise the participants in each study.

Table 1. Data extracted from the included study

Study	Purpose	Participants, sample size	Skills	Type of VBI used	Implementation support
[29]	To gauge the effectiveness of instructional video modelling for teaching life skills to children with ASD.	Participants, 3 years old children Sample Size (n=3)	Making orange juice, preparing mail, tending to pets, cleaning a fish bowl, and setting the table.	Instructional video modeling	Concrete reinforcement, praise
[30]	To examine the efficiency of a commercially available video model in teaching hand-washing to children with ASD.	Participant, 3 to 5 years Sample Size (n=3)	Hand-washing skills	Video modeling	Praise
[31]	To evaluate the effectiveness of point-of-view video modeling in teaching a boy with ASD to serve himself an afternoon snack using forward-chaining.	Participant, Four years old children Sample Size(n=1)	Preparing meals	Point-of-view video modeling	Verbal prompting forward chaining
[32]	To investigate if iPad-based point-of-view video modeling effectively teaches self-care and daily living skills to children with ASD.	Participant 7.5 to 13.5 years old children Sample Size (n=8)	Tying shoes, brushing teeth, using the restroom, eating independently, managing finances, and doing household chores.	Point-of-view video modeling	verbal praise
[33]	To assess the efficacy of a three-week internet-based video modeling intervention for teaching proper brushing techniques	Participant 5-15 years old children Sample Size (n=18)	Oral hygiene	Video modeling	Twice-daily reminder e-mails
[34]	To study the impact of a video modeling intervention on enhancing independent toileting skills in two young boys with ASD.	Participant 4-5 years old children Sample Size (n=2)	Toilet Train	video self-modelling and point-of-view modelling	Verbal praise, animations, and chaining procedure
[35]	To examine the outcomes of a video modeling intervention that combines real and animated models with a chaining procedure.	Participant 7 to 8 years old children Sample Size (n=2)	Toilet Train	video self-modelling and point-of-view modelling	Verbal praise, animation prompting, and reinforcement
[36]	To explore the impact of an instructional package, in toilet-training a 4-year-old boy with ASD.	Participant 4 years old children Sample Size (n=1)	Toilet Train	Video modeling	Reinforcement – food Picture prompt
[37]	To examine the effectiveness of video prompting combined with backward chaining for mastering the shoe-tying skills in children with ASD	Participant 5 years old children Sample Size (n=3)	Tying shoes	Video Prompting	Verbal praise, physical rewards, backward chaining.

3.3. Implementing VBI with appropriate implementation support to children with ASD can successfully improve children's ADL skills

The studies suggest that VBIs with appropriate implementation support, such as reinforcement, verbal prompting, animations, and chaining procedures, can improve ADL skills in children with ASD. Prompting guides participants with spoken cues, reduces confusion, and facilitates learning. This intervention component clarifies expectations and ensures an understanding of the targeted behaviour. [31] used verbal prompting to teach meal preparation skills to a child with ASD. Otherwise, [37] and [35] used video prompting to teach tying shoes and toileting skills to children with ASD. Forward and backward chaining is a task analysis technique that breaks down complex behaviours into smaller, more manageable steps. [31] and [34] used forward chaining to teach meal preparation and toileting skills to children with ASD. Nevertheless, [37] used to teach tying shoes to children with ASD. The use of animation in video modelling interventions can be promising in teaching play skills to children with ASD, particularly those with toilet skills deficiency [34], [35].

Reinforcement strategies are critical in promoting positive behaviour change and maintaining engagement in behavioural interventions. In the study mentioned earlier, various reinforcement strategies are utilised to maximise the effectiveness of the intervention. Verbal praise effectively promotes skill acquisition in children with ASD [29], [34]–[37]. By offering participants positive feedback and acknowledging their efforts, researchers can boost their self-esteem and motivation to continue practising the targeted behaviour. Verbal praise can be provided spontaneously or upon completing specific tasks, ensuring participants feel recognised and valued for their progress. Tangible rewards, such as candy or access to a preferred toy, can motivate behaviour change. Researchers can create a clear link between the desired behaviour and a positive outcome by providing participants with a concrete incentive. Physical rewards also allow the intervention to be tailored to children's preferences, ensuring the reinforcement remains appealing and effective for each participant [29], [31], [37]. In each study, [34] and [35] used verbal praise, animations, a prompting and reinforcement procedure, verbal praise, and animations to toilet-train two children. [37] employed backwards chaining, verbal recognition, and physical rewards with video prompting to teach how to tie shoes. Otherwise, [31] used concrete reinforcement implementation support to conduct their research. The study of [34] and [35] also uses animation and chaining to teach complex skills to children with ASD. Table 1 summarises the data extracted in the included study.

4. DISCUSSION

Children with ASD frequently encounter challenges when it comes to independently engaging in everyday tasks due to their difficulties in processing sensory information and adapting to changes in routine [38]. VBI has been extensively theorised by [12]. According to Bandura’s theory, when children are presented with models that they can easily relate to and find captivating, they are more inclined to engage in activities actively and possess the motivation to accomplish tasks. This aspect holds significant importance within numerous intervention approaches. Despite the promising potential of VBI for improving various domains of human behaviour, several studies have shown that multiple factors, such as implementation support, influence the effectiveness of VBI [39]. Additional implementation support could increase VBI efficiency across all age groups, including preschoolers [29], [31]. Incorporating personalised approaches within this implementation support helps facilitate an even more engaging learning environment by fostering more robust connections between children's needs and interests while promoting higher motivation levels, leading to long-term gains seen through better retention rates post-intervention. One evidence-based implementation support that effectively supports children with ASD is reinforcement [40], [41]. This method provides immediate feedback on performance while allowing for repeated practice of targeted skills within a structured setting. Praise and tangible rewards such as stickers or small toys are particularly effective reinforcement for children with ASD that can make learning more meaningful by reinforcing specific steps within each skill [41].

Other than that, based on the study, animation in video modelling enables educators to create dynamic scenarios that replicate real-life situations while keeping the child's interest intact [34], [42]. Animated videos have proven effective in enhancing communication, social interaction, and generalisation of learned skills across different environments for children with ASD. Furthermore, animated characters in videos are less intimidating than live models or static images, as they provide non-threatening visual aids that facilitate skill acquisition without triggering anxiety or fear responses commonly observed in some autistic learners during face-to-face interactions [43]. Nevertheless, it is essential to consider that some animations might be too fast-paced or complex, making it challenging for children with ASD to understand and construct a mental model of the task. Additionally, they may need domain-specific knowledge, further hindering their ability to grasp the concepts presented in the videos [44].

While the results are promising, it is crucial to avoid relying solely on a single method or technique when working with children with ASD since people may respond differently based on their unique needs and

preferences [45]. Using chaining and prompting techniques has shown a positive correlation with acquiring crucial life skills in children with ASD [31]. This teaching strategy provides a structured approach to learning, which can be particularly beneficial for children who thrive on routine. Breaking down complex tasks into smaller steps allows learners to acquire new skills gradually, minimising frustration and confusion. Additionally, incorporating personalised prompts during video modelling sessions enhances learning opportunities and promotes engagement. However, it is challenging to determine which specific variable (video modelling, prompting, or reinforcement) contributes to skill acquisition when video modelling interventions consist of multiple components or implementation support [46].

This study has several limitations; due to limited access to these databases, only three databases were used, namely Scopus, Web of Science, and Google Scholar, from 2012–2022. This study employed "video-based intervention" or "video modeling" as primary search keywords. However, other keys, such as video recording, computer-assisted instruction, and others, should be considered in future studies. These added terms should increase the relevancy of research results. Further research should focus on i) a more extended range of study years, ii) the use of specific generalisation and maintenance dimensions to assess the effectiveness of the intervention, iii) studies that include pre-screening treatment that looks into imitation ability, iv) examine the effectiveness of the VBI as both the whole intervention or intervention component, v) include more significant sample sizes, vi) include different search engines, vii) ensure adequate follow-up after the treatment phase, and viii) include studies with a social validity assessment.

5. CONCLUSION

The current study conducted a scoping review of VBI to teach ADL to children with ASD. This scoping review strengthens the notion that VBI is a beneficial intervention strategy that helps improve several ADL abilities. Furthermore, VBI~~s~~ can improve ADL by simulating the activities of the video model in sequential stages. As a result, using VBI~~s~~ as an intervention approach and additional implementation support can help and encourage children with ASD to be optimum independent in ADL. Furthermore, using VBIs to assist with targeted skills should be made public so that all stakeholders, particularly practitioners and parents, can benefit from the vast range of viable strategies to help in the intervention process.

ACKNOWLEDGEMENT

The authors extend their appreciation to the Sultan Idris Education University (UPSI) under the Special Interest Group Grant (SIG Research Code: 2021-0132-107-01) for supporting this Post-Doctoral research work on Autism.

REFERENCES

[1] H. Hodges, C. Fealko, and N. Soares, "Autism spectrum disorder: definition, epidemiology, causes, and clinical evaluation," *Translational Pediatrics*, vol. 9, no. S1, pp. S55–S65, Feb. 2020, doi: 10.21037/tp.2019.09.09.

[2] Ministry of Health (MOH) Malaysia, *Clinical practice guidelines management of autism spectrum disorder in children and adolescents*. Putrajaya, 2014.

[3] J. Baio *et al.*, "Prevalence of autism spectrum disorder among children aged 8 years - autism and developmental disabilities monitoring network, 11 sites, united states, 2014," *MMWR. Surveillance Summaries*, vol. 67, no. 6, pp. 1–23, Apr. 2018, doi: 10.15585/mmwr.ss6706a1.

[4] P. O. Towle, P. A. Patrick, T. Ridgard, S. Pham, and J. Marrus, "Is earlier better? the relationship between age when starting early intervention and outcomes for children with autism spectrum disorder: a selective review," *Autism Research and Treatment*, vol. 2020, pp. 1–17, Aug. 2020, doi: 10.1155/2020/7605876.

[5] Y. Fandakova and C. A. Hartley, "Mechanisms of learning and plasticity in childhood and adolescence," *Developmental Cognitive Neuroscience*, vol. 42, Apr. 2020, doi: 10.1016/j.dcn.2020.100764.

[6] M. L. E. Clark, Z. Vinen, J. Barbaro, and C. Dissanayake, "School age outcomes of children diagnosed early and later with autism spectrum disorder," *Journal of Autism and Developmental Disorders*, vol. 48, no. 1, pp. 92–102, Jan. 2018, doi: 10.1007/s10803-017-3279-x.

[7] S. Lemcke, E. T. Parner, M. Bjerrum, P. E. R. H. Thomsen, and M. B. Lauritsen, "Early regulation in children who are later diagnosed with autism spectrum disorder: a longitudinal study within the danish national birth cohort," *Infant Mental Health Journal*, vol. 39, no. 2, pp. 170–182, Mar. 2018, doi: 10.1002/imhj.21701.

[8] V. H. Bal, S.-H. Kim, D. Cheong, and C. Lord, "Daily living skills in individuals with autism spectrum disorder from 2 to 21 years of age," *Autism*, vol. 19, no. 7, pp. 774–784, Oct. 2015, doi: 10.1177/1362361315575840.

[9] L. Brown, J. Nietupski, and S. Hamre-Nietupski, *The criterion of ultimate functioning*. The Council for Exceptional Children, 1976.

[10] L. L. Weaver, "Effectiveness of work, activities of daily living, education, and sleep interventions for people with autism spectrum disorder: a systematic review," *The American Journal of Occupational Therapy*, vol. 69, no. 5, Sep. 2015, doi: 10.5014/ajot.2015.017962.

[11] S. Bellini and J. Akullian, "A meta-analysis of video modeling and video self-modeling interventions for children and adolescents with autism spectrum disorders," *Exceptional Children*, vol. 73, no. 3, pp. 264–287, Apr. 2007, doi: 10.1177/001440290707300301.

[12] A. Bandura, "Self-efficacy: toward a unifying theory of behavioral change," *Psychological Review*, vol. 84, no. 2, pp. 191–215, 1977, doi: 10.1037/0033-295X.84.2.191.

[13] D. Cihak, C. Fahrenkrog, K. M. Ayres, and C. Smith, "The use of video modeling via a video ipod and a system of least prompts to

improve transitional behaviors for students with autism spectrum disorders in the general education classroom," *Journal of Positive Behavior Interventions*, vol. 12, no. 2, pp. 103–115, Apr. 2010, doi: 10.1177/1098300709332346.
[14] N. Abd Aziz, M. Kadar, D. Harun, and H. F. Mohd Rasdi, "Video modelling to improve hand dexterity in students with learning disabilities: special education teachers' perspectives," *Jurnal Sains Kesihatan Malaysia*, vol. 20, no. 1, pp. 151–160, Jan. 2022, doi: 10.17576/JSKM-2022-2001-14.
[15] C. Keenan, A. Thurston, C. Storey, and K. Urbanska, "PROTOCOL: video-based interventions for promoting positive social behaviour in children with autism spectrum disorders: a systematic review and meta-analysis," *Campbell Systematic Reviews*, vol. 17, no. 2, Jun. 2021, doi: 10.1002/cl2.1171.
[16] C. R. Carnahan, P. S. Williamson, and J. Christman, "Linking cognition and literacy in learners with autism spectrum disorder," *TEACHING Exceptional Children*, vol. 43, no. 6, pp. 54–62, Jul. 2011, doi: 10.1177/004005991104300606.
[17] N. Abd Aziz, M. Kadar, D. Harun, and H. F. Mohd Rasdi, "Implementation of video modeling in the occupational therapy intervention process for children and adolescents with special needs: a scoping review," *Occupational Therapy In Health Care*, vol. 35, no. 2, pp. 227–244, Apr. 2021, doi: 10.1080/07380577.2021.1876967.
[18] T. A. Taber, N. Lambright, and J. K. Luiselli, "Video modeling training effects on types of attention delivered by educational care-providers," *Behavior Analysis in Practice*, vol. 10, no. 2, pp. 189–194, Jun. 2017, doi: 10.1007/s40617-017-0182-z.
[19] T. Cardon and T. Azuma, "Visual attending preferences in children with autism spectrum disorders: a comparison between live and video presentation modes," *Research in Autism Spectrum Disorders*, vol. 6, no. 3, pp. 1061–1067, Jul. 2012, doi: 10.1016/j.rasd.2012.01.007.
[20] S.-Y. Wang, Y. Cui, and R. Parrila, "Examining the effectiveness of peer-mediated and video-modeling social skills interventions for children with autism spectrum disorders: a meta-analysis in single-case research using hlm," *Research in Autism Spectrum Disorders*, vol. 5, no. 1, pp. 562–569, Jan. 2011, doi: 10.1016/j.rasd.2010.06.023.
[21] S. Zlotnik, E. Gal, and P. L. Weiss, "Video modelling as a tool to evaluate self-perception of strategies used by adolescents during daily tasks," *Disability and Rehabilitation: Assistive Technology*, vol. 17, no. 2, pp. 177–183, Feb. 2022, doi: 10.1080/17483107.2020.1774809.
[22] C. K. Nikopoulos and M. Keenan, "Promoting social initiation in children with autism using video modeling," *Behavioral Interventions*, vol. 18, no. 2, pp. 87–108, Apr. 2003, doi: 10.1002/bin.129.
[23] C. J. Lindsay, D. W. Moore, A. Anderson, and K. Dillenburger, "The role of imitation in video-based interventions for children with autism," *Developmental Neurorehabilitation*, vol. 16, no. 4, pp. 283–289, Aug. 2013, doi: 10.3109/17518423.2012.758185.
[24] C. Rayner, "Video-based intervention for children with autism: towards improved assessment of pre-requisite imitation skills," *Developmental Neurorehabilitation*, vol. 18, no. 2, pp. 113–121, Mar. 2015, doi: 10.3109/17518423.2014.890959.
[25] H. Arksey and L. O'Malley, "Scoping studies: towards a methodological framework," *International Journal of Social Research Methodology*, vol. 8, no. 1, pp. 19–32, Feb. 2005, doi: 10.1080/1364557032000119616.
[26] D. Levac, H. Colquhoun, and K. K. O'Brien, "Scoping studies: advancing the methodology," *Implementation Science*, vol. 5, no. 1, Dec. 2010, doi: 10.1186/1748-5908-5-69.
[27] Z. Munn, M. D. J. Peters, C. Stern, C. Tufanaru, A. McArthur, and E. Aromataris, "Systematic review or scoping review? guidance for authors when choosing between a systematic or scoping review approach," *BMC Medical Research Methodology*, vol. 18, no. 1, Dec. 2018, doi: 10.1186/s12874-018-0611-x.
[28] H. L. Colquhoun *et al.*, "Scoping reviews: time for clarity in definition, methods, and reporting," *Journal of Clinical Epidemiology*, vol. 67, no. 12, pp. 1291–1294, Dec. 2014, doi: 10.1016/j.jclinepi.2014.03.013.
[29] R. Shipley-Benamou, J. R. Lutzker, and M. Taubman, "Teaching daily living skills to children with autism through instructional video modeling," *Journal of Positive Behavior Interventions*, vol. 4, no. 3, pp. 166–177, Jul. 2002, doi: 10.1177/10983007020040030501.
[30] Nancy E. Rosenberg, Ilene S. Schwartz, and Carol A. Davis, "Evaluating the utility of commercial videotapes for teaching hand washing to children with autism," *Education and Treatment of Children*, vol. 33, no. 3, pp. 443–455, 2010, doi: 10.1353/etc.0.0098.
[31] A. Shrestha, A. Anderson, and D. W. Moore, "Using point-of-view video modeling and forward chaining to teach a functional self-help skill to a child with autism," *Journal of Behavioral Education*, vol. 22, no. 2, pp. 157–167, Jun. 2013, doi: 10.1007/s10864-012-9165-x.
[32] C. Meister and J. Salls, "Video modeling for teaching daily living skills to children with autism spectrum disorder: a pilot study," *Journal of Occupational Therapy, Schools, & Early Intervention*, vol. 8, no. 4, pp. 307–318, Oct. 2015, doi: 10.1080/19411243.2015.1107005.
[33] B. Popple *et al.*, "Brief report: remotely delivered video modeling for improving oral hygiene in children with asd: a pilot study," *Journal of Autism and Developmental Disorders*, vol. 46, no. 8, pp. 2791–2796, Aug. 2016, doi: 10.1007/s10803-016-2795-4.
[34] B. Drysdale, C. Y. Q. Lee, A. Anderson, and D. W. Moore, "Using video modeling incorporating animation to teach toileting to two children with autism spectrum disorder," *Journal of Developmental and Physical Disabilities*, vol. 27, no. 2, pp. 149–165, Apr. 2015, doi: 10.1007/s10882-014-9405-1.
[35] L. McLay, A. Carnett, L. van der Meer, and R. Lang, "Using a video modeling-based intervention package to toilet train two children with autism," *Journal of Developmental and Physical Disabilities*, vol. 27, no. 4, pp. 431–451, Aug. 2015, doi: 10.1007/s10882-015-9426-4.
[36] C. Y. Q. Lee, A. Anderson, and D. W. Moore, "Using video modeling to toilet train a child with autism," *Journal of Developmental and Physical Disabilities*, vol. 26, no. 2, pp. 123–134, Apr. 2014, doi: 10.1007/s10882-013-9348-y.
[37] P. R. Richard and G. H. Noell, "Teaching children with autism to tie their shoes using video prompt-models and backward chaining," *Developmental Neurorehabilitation*, vol. 22, no. 8, pp. 509–515, Nov. 2019, doi: 10.1080/17518423.2018.1518349.
[38] C. Mallory and B. Keehn, "Implications of sensory processing and attentional differences associated with autism in academic settings: an integrative review," *Frontiers in Psychiatry*, vol. 12, Aug. 2021, doi: 10.3389/fpsyt.2021.695825.
[39] S. C. Domire and P. Wolfe, "Effects of video prompting techniques on teaching daily living skills to children with autism spectrum disorders," *Research and Practice for Persons with Severe Disabilities*, vol. 39, no. 3, pp. 211–226, Sep. 2014, doi: 10.1177/1540796914555578.
[40] J. K. Hardy and R. H. McLeod, "Using positive reinforcement with young children," *Beyond Behavior*, vol. 29, no. 2, pp. 95–107, 2020.
[41] S. P. H. Camargo, M. Rispoli, J. Ganz, E. R. Hong, H. Davis, and R. Mason, "Behaviorally based interventions for teaching social interaction skills to children with asd in inclusive settings: a meta-analysis," *Journal of Behavioral Education*, vol. 25, no. 2, pp. 223–248, Jun. 2016, doi: 10.1007/s10864-015-9240-1.
[42] E. Barut Tugtekin and O. O. Dursun, "Effect of animated and interactive video variations on learners' motivation in distance education," *Education and Information Technologies*, vol. 27, no. 3, pp. 3247–3276, Apr. 2022, doi: 10.1007/s10639-021-10735-5.
[43] E. J. Carter, D. L. Williams, J. K. Hodgins, and J. F. Lehman, "Are children with autism more responsive to animated characters? a

study of interactions with humans and human-controlled avatars," *Journal of Autism and Developmental Disorders*, vol. 44, no. 10, pp. 2475–2485, Oct. 2014, doi: 10.1007/s10803-014-2116-8.
[44] R. Ploetzner, S. Berney, and M. Bétrancourt, "A review of learning demands in instructional animations: the educational effectiveness of animations unfolds if the features of change need to be learned," *Journal of Computer Assisted Learning*, vol. 36, no. 6, pp. 838–860, Dec. 2020, doi: 10.1111/jcal.12476.
[45] A. H. Anderson, J. Stephenson, and M. Carter, "A systematic literature review of the experiences and supports of students with autism spectrum disorder in post-secondary education," *Research in Autism Spectrum Disorders*, vol. 39, pp. 33–53, Jul. 2017, doi: 10.1016/j.rasd.2017.04.002.
[46] C. Rayner, C. Denholm, and J. Sigafoos, "Video-based intervention for individuals with autism: key questions that remain unanswered," *Research in Autism Spectrum Disorders*, vol. 3, no. 2, pp. 291–303, Apr. 2009, doi: 10.1016/j.rasd.2008.09.001.

BIOGRAPHIES OF AUTHORS

Nurul Khairani Ismail is a Post Doctoral officer at University Pendidikan Sultan Idris, Tanjung Malim Perak. Her educational background includes a Bachelor's degree in Nursing from International Islamic University Malaysia's, hold second degree in education, specialising in Educational Psychology from the same university, and a Ph.D. in Preschool Education from Universiti Kebangsaan Malaysia. She has experience in teaching and as research for 9 years. Her research interests and experience are varied, ranging from early childhood and special education through character education and road safety education for children. She can be contacted at email: khairani.miros@gmail.com.

Hasrul Hosshan is a Senior Lecturer at the Faculty of Human Development, Universiti Pendidikan Sultan Idris (UPSI), Malaysia and Honorary Lecturer at, Centre on Disability Research and Policy, The University of Sydney, Australia. He does research in education and community setting related explicitly to disability inclusion, social participation, center based-rehabilitation, parenting and teaching quality. He is also a member of the International Association for the Scientific Study of Intellectual and Developmental Disabilities (IASSIDD). He is actively involved as a Disability Advocacy in local and international level. He can be contacted at email: hasrul.hosshan@fpm.upsi.edu.my.

Nurbieta Abd Aziz get her PHD in Occupational Therapy from Universiti Kebangsaan Malaysia (2022), MSc in Disability Policy and Practice from Flinders University Australia (2016), with 22 years of experience in Occupational Therapy fields. She is a senior lecturer at Universiti Pendidikan Sultan Idris, specialising in Occupational Therapy interventions for children with special needs, including autism spectrum disorders. She can be contacted at emai: nurbieta@fpm.upsi.edu.my.

Abdul Halim Masnan is the Assoc. Prof of Department of Early Childhood Education at Universiti Pendidikan Sultan Idris. He is a PhD holder from the Universiti Sains Malaysia. He is an Adjunct Professor at UNITAR and visiting professor at UNNES, Semarang, Indonesia. He also received an Erasmus grant in March 2022 for a 3-week teaching mobility program at Trnava University, Slovakia. He specialises in Early Childhood Education. His Pedagogy in Early Childhood Education expertise made him a team member conducting research projects and advisory boards in Malaysia and overseas. He can be contacted at email: abdul.halim@fpm.upsi.edu.my.

Norsayyidatina Che Rozubi is a Senior Lecturer in Counselling at the Psychology and Counselling Department, Faculty of Human Development, Sultan Idris Education University (UPSI) and is a registered counsellor. She graduated with a B. ed (Counselling and Guidance) from University Malaya (UM) in 2008, M. Ed (Counselling and Guidance) at National University Malaysia (UKM) in 2011 and Phd in Counselling at University Malaya in 2017. She has 15 years of experience in counselling and had served as a counsellor in boarding school. Her expertise is in children's counselling. Now she is doing postdoctoral at University of Edinburgh, United Kingdom, focusing on child sexual abuse and exploitation. She can be contacted at email: sayyidatina@fpm.upsi.edu.my.

Mohd Muslim Md Zalli is a Senior Lecturer at the Faculty of Human Development, Universiti Pendidikan Sultan Idris (UPSI), Malaysia. He researches higher learning education and school settings related explicitly to learners' behavior in online courses, learning strategies, and teaching quality. He is also a member of the International Study Association on Teachers and Teaching and is actively involved as the ATLAS.ti certified trainer. He can be contacted at email: muslim@fpm.upsi.edu.my.

Siti Roshaidai Mohd Arifin holds the position of Associate Professor at the Kulliyyah of Nursing, International Islamic University Malaysia (IIUM), Kuantan Campus. Dr. Roshaidai has been honored as one of the 30 Best Contributors to IIUM's Research Performance for three consecutive years: 2022, 2021, and 2020, and has received the High Impact Responsible Research Award in 2022 and 2020. Additionally, Dr. Roshaidai has garnered recognition from the University of Stirling for her outstanding participation in an international research project involving collaboration across four countries: the United Kingdom, Malaysia, Indonesia, and Thailand. She may be reached via email at roshaidai@iium.edu.my.