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Article

Teaching functional skills for individual with autism spectrum disorder (ASD): a systematic review

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ABSTRACT

Functional skills are an ability needed to navigate everyday daily life. In recent years, many research conducted to improve the functional skills of an individual with autism spectrum disorder (ASD) using a specific intervention. This study investigates articles related to functional skills for an individual with ASD in the database Sage Journal, Scopus, and Springer Link. The selected articles were chosen based on keywords, years of publication and criteria of inclusion. A total of 46 articles were selected to be reviewed in this research. This article used systematic reviews PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) as its method to obtain the selected articles among others articles in databases. The results showed social skills were there were several types of functional skills that were rarely studied, types of interventions that were rarely used and there were several interventions that were not effective to us. This study provides valuable information on improving functional skills for an individual with ASD and the intervention used to improve it.

Keywords:

Function skills,
Autism spectrum disorder,
ASD,
Systematic review

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Introduction

Autism spectrum disorder (ASD) or most commonly known as autism is a neurodevelopmental disorder that is often characterized by social impairments, communication delays, non-typical behaviors, and repetitive, restricted and stereotyped behaviors and interest (American Psychiatric Association, 2013; Volkmar & Pauls, 2003). As the result, individuals with ASD experienced lower academic performance, maladaptive behavioral issues, deficit in imitation skills, issues with expressiveness, deficits in functional skill, and receptive and pragmatic language. The lack of ability to perform functional skills can negatively impact independence and quality of life and also make families who have individual with ASD in their family member experienced difficulty (Dijkhuis et al., 2020).

The acquisition, adeptness and maintenance of functional skills are among the most important skill to get for every individual. Functional skills allow us to take care of ourself and perform independencies in our environment. For most people, the acquisition of functional skills received from life experiences. However, for individual with ASD, it needs special strategy, media, or method (LaRue et al., 2016). Many articles researched strategies to improve functional skills for individual with ASD, either by using media, method or combine of those two (i.e., Yakubova et al.; Kurt & Kutlu; and Cho et al.).

Functional skills are frequently demanded in domestic, vocational, and community environments. These skills are not limited to performances, that affect the actual survival or physical well-being of individual, but also include variety of skills which influence individual ability to perform as independently, productively as possible in every environment (LaRue et al., 2016). It allows us to take care of ourselves and function independently in our natural environment (Storey & Miner, 2011). To teach functional skills requires instructional programs that involve skills of immediate of usefulness to individual and employ teaching materials that are real rather than simulated, so that's means the skills must be immediately useful (Alodat et al., 2020). Functional skills are self-care skills, domestic skills, community skills, pre-vocational skills, vocational skills, recreational skills, social skills, behavior management skills, (LaRue et al., 2016) and academic functional skills (Mumpuniarti & Pujaningsih, 2016).

Functional skills are important to learn because they are vital for independent living. Without that skill, individual's potential to progress in educational, vocational and domestic setting is limited and continued reliance on parents or caregivers for such task can stress those individuals (Estes et al., 2009; Pierce & Schreibman, 1994; Shrestha et al., 2013). Independence when performing functional skills are also an important area of focus for individual with ASD to learn. Performing functional skills independently plays a critical role in successful inclusion of individuals in the community and workplace environment and children my feel more empowered or more in control in their lives (Carnahan et al., 2009; Gardner & Wolfe, 2019).

Some difficulties areas of functional skills in individual with ASD are toileting (Szyndler, 1996), food preparation (Johnson et al., 2013), price comparison (Browder & Spooner, 2011; Storey & Miner, 2011; Weng & Bouck, 2014), job interviews (Munandar et al., 2021; Simpson & Myles, 2011), customer service (Bross et al., 2019), leisure activity (Armendariz & Hahs, 2019; Lee et al., 2017) and social skills (Blackwell & Stockall, 2021). Recent research has shown functional skills of individual with ASD could be improved by using various intervention such as robot-based play drama (So et al., 2020), convert audio coaching (Mason et al., 2020), virtual reality (Dixon et al., 2020; Miller et al., 2020), teacher-implemented video-enhanced activity schedule (Ledbetter-Cho et al., 2020), inclusive physical activity program (Sansi et al., 2021), and incidental teaching (Blackwell & Stockall, 2021). Neely et al. (2016) reviewed articles on generalization and maintenance of functional living skills, different from this article which focuses more on teaching of functional skills.

This study aims to provide evidence in the form of data from all types of functional skills and various types of media used are compared with previous researches that examined more about certain types of functional skills (Bennett & Dukes, 2014; Radley et al., 2020) or focused more in the media they used (Hanna et al., 2021). It is hoped that with the writing of this article, future researchers can use this article as a guide and carry out research that further expands the range of research in other types of functional skills, using different media than what has been used and deepening the search for the effectiveness of the media. This study systematically reviews previous research, suggest other areas for further analysis, and conducted to obtain answers to questions, in the form of: (RQ1) how many articles researched improving the functional skills of ASD children published per year? (RQ2) which functional skill are most researched? (RQ3) which intervention was used in the research about to improve functional skills of individual with ASD? And (RQ4) to what extent the effectiveness of each intervention in improving functional skill?

Method

This study was conducted using systematic review. Systematic review is very useful for synthesizing various relevant research results, so that the facts presented are more comprehensive and balanced. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) used a guideline to select articles that match the criteria required for this article. The Prisma had abstract checklist which can be used as a guide in selecting the required articles. The abstract checklist is as follows (Beller et al., 2013) :

Table 1. The PRISMA for Abstract Checklist

Title	Identify the report as a systematic review, meta-analysis, or both.
Objectives:	The research question including components such as participants, interventions, comparators, and outcomes.
Eligibility criteria:	Study and report characteristics used as criteria for inclusion.
Information sources:	Key databases searched and search dates.
Risk of bias:	Methods of assessing risk of bias.
Included studies:	Number and type of included studies and participants and relevant characteristics of studies.
Synthesis of results:	Results for main outcomes (benefits and harms), preferably indicating the number of studies and participants for each. If meta-analysis was done, include summary measures and confidence intervals.
Description of the effect:	Direction of the effect (i.e., which group is favored) and size of the effect in terms meaningful to clinicians and patients.
Strengths and Limitations of evidence:	Brief summary of strengths and limitations of evidence (e.g., inconsistency, imprecision, indirectness, or risk of bias, other supporting or conflicting evidence.
Interpretation:	General interpretation of the results and important implications.
Funding:	Primary source of funding for the review.
Registration:	Registration number and registry name.

Data was collected from the online journal database indexed by Sage Journal, Scopus and Springer Link. The inclusion criteria used in searching for the selected articles are described in Table 1.

Table 2. Inclusion Criteria

Criteria	Description
Topic	The research articles have discussion topics related to intervention, ASD, and functional skills.
Period	The research articles were published between 2012 – 2022 and relate to the subject that being reviewed.
Research Base	The research articles cover quantitative studies.
Transparency	Research method from the research articles that was used to reviewed must explicitly indicate sample size, instruments and analysis.
Validity	The research result must be valid and reliable.

The keywords that used to search to find relevant articles were “functional skill”, “functional skills”, “autism”, “autistic”, and “ASD”. These keywords were searched in title and abstract of studies to determine which studies relevant for inclusion to be reviewed in this study. This study used the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) as a guideline to obtain good quality systematic review (Beller et al., 2013). Below is the checklist and flowchart to assist in reporting the review results.

Figure 1. Search and Selection Summary

The selected studies were identified and screened through eight stages: 1) Development of criteria of inclusion (see Table 1), to make sure that it is systematically reviewed, studies that didn't fit criteria of inclusion were excluded from the review; 2) Searching related studies in online journal databases indexed by Sage Journal, Scopus, and SpringerLink using tracking: title, abstract, and keywords referring to functional skills, autism. The studies that were discussed in this review were considered fit in criteria of inclusion; 3) Limitation of finding studies that was published to 2012 – 2022; 4) Doing wider investigation of study that fit with criteria of inclusion and kept for review; 5) An independent rater screened 50 % of the 46 studies (n=23) for investigation of study that fit with criteria of inclusion. Two raters reviewed together, and a collaborative decision was made of how to categorize the data; 6) Carry out studies analysis to construct critical reviews of functional skills; 7) Impact factor analysis by including the effect size or calculating the effect size for articles that do not include it; 8) Making conclusions based on final analysis that has been carried out and validated by this review.

Hasil dan Pembahasan

RQ1. How many articles researched improving the functional skills of ASD children published per year?

There were 46 articles included in this systematic review that was published during 2012–2022, with the highest released articles being published in 2018 with 8 articles were released that year. There was no article that was published on the topic of functional skills in 2022, as shown in figure 2.

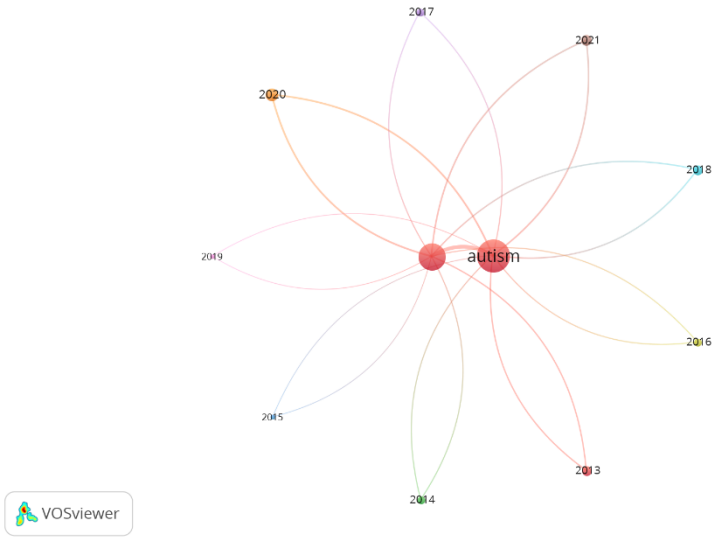

Figure 2. Number of Published Articles per year

In 2012, article about improving functional skills of ASD children was 1 article (Bereznak et al., 2012). 7 articles were released which researched in 2013 (Bennett et al., 2013; Burton et al., 2013; Johnson et al., 2013; Kandalaft et al., 2013; McKissick et al., 2013; Shrestha et al., 2013; Wilson, 2013) and 2019 (Armendariz & Hahs, 2019; Bross et al., 2019; Dueñas et al., 2019; Gardner & Wolfe, 2019; Hutchinson et al., 2019; Kurt & Kutlu, 2019; Yakubova et al., 2019). Meanwhile 3 articles were released in 2014 (Grosberg & Charlop, 2014; C. Y. Q. Lee et al., 2014; Weng & Bouck, 2014), 2015 (Finn et al., 2015; Kamps et al., 2015; Macpherson et al., 2015) and 2016 (Halle et al., 2016; Harriage et al., 2016; Leaf et al., 2016). 5 articles were released in 2017 (Alaniz et al., 2017; Bradshaw et al., 2017; Godish et al., 2017; S. Y. Lee et al., 2017; Probst & Walker, 2017) and 2020 (Dixon et al., 2020; Ledbetter-Cho et al., 2020; Mason et al., 2020; Miller et al., 2020; So et al., 2020). The next year in 2018, 8 articles were released (Chang et al., 2018; Davis et al., 2018; Edwards et al., 2018; Kim et al., 2018; Kurnaz & Yanardag, 2018; Law et al., 2018; Walsh et al., 2018; Wertalik & Kubina, 2018). In 2021, 4 articles were released (Blackwell & Stockall, 2021; Munandar et al., 2021; Sansi et al., 2021; Yakubova & Chen, 2021). However, no article was released in 2022.

RQ2. Which functional skills are most researched?

There were many types of functional skills that were researched in these selected articles. Among the 46 articles, social skills were searching the most among other types of functional skills with 14 articles researched how to increase social skills of individuals with ASD. There were only 2 articles that were researched about how to increase pre-vocational skills for individuals with ASD, same with academic functional skills, only 2 articles researched about them.

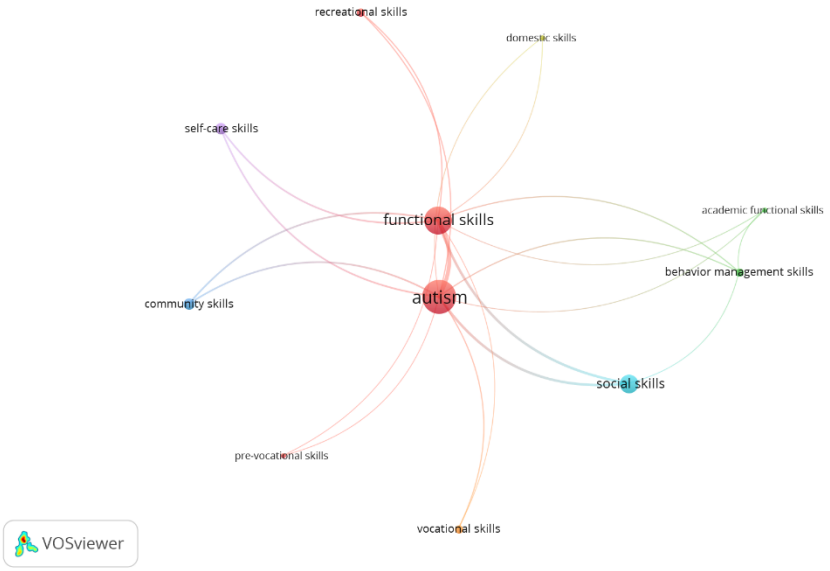

Figure 3. Types of Functional Skills of Selected articles

Among 46 articles that were selected, 8 articles were researched about improving self-care skills of ASD children (Alaniz et al., 2017; Bereznak et al., 2012; Godish et al., 2017; Kurt & Kutlu, 2019; C. Y. Q. Lee et al., 2014; Probst & Walker, 2017; Shrestha et al., 2013; Wertalik & Kubina, 2018). While domestic skills were researched in 3 articles (Gardner & Wolfe, 2019; Johnson et al., 2013; Yakubova & Chen, 2021) and community skills were researched in 5 articles (Dixon et al., 2020; Harriage et al., 2016; McKissick et al., 2013; Miller et al., 2020; Weng & Bouck, 2014). 2 articles were researched about pre-vocational skills (Hutchinson et al., 2019; Munandar et al., 2021) and academic functional skills (Burton et al., 2013; Ledbetter-Cho et al., 2020). Vocational skills were researched in 4 articles (Bennett et al., 2013; Bereznak et al., 2012; Bross et al., 2019; Yakubova et al., 2019) and 7 articles were researched about recreational skills (Armendariz & Hahs, 2019; Chang et al., 2018; Dueñas et al., 2019; Edwards et al., 2018; Kurnaz & Yanardag, 2018; S. Y. Lee et al., 2017; So et al., 2020). 14 Articles were researched social skills (Alaniz et al., 2017; Blackwell & Stockall, 2021; Davis et al., 2018; Grosberg & Charlop, 2014; Halle et al., 2016; Kamps et al., 2015; Kandalaft et al., 2013; Law et al., 2018; Leaf et al., 2016; Macpherson et al., 2015; Mason et al., 2020; Neely et al., 2016; Sansi et al., 2021; Walsh et al., 2018; Wilson, 2013), while 6 articles were researched behavior management skills (Bradshaw et al., 2017; Finn et al., 2015; Kandalaft et al., 2013; Kim et al., 2018; Ledbetter-Cho et al., 2020; Sansi et al., 2021).

RQ3. Which intervention was used in the research to improve functional skills of individual with ASD?

46 articles that were selected, there were many types of intervention that was used to increase the functional skill of individual with ASD. These interventions were grouped into two groups based on cognitive and behavior. Intervention based on behavior were more widely used, namely 34 articles. While intervention based on cognitive were used in 12 articles.

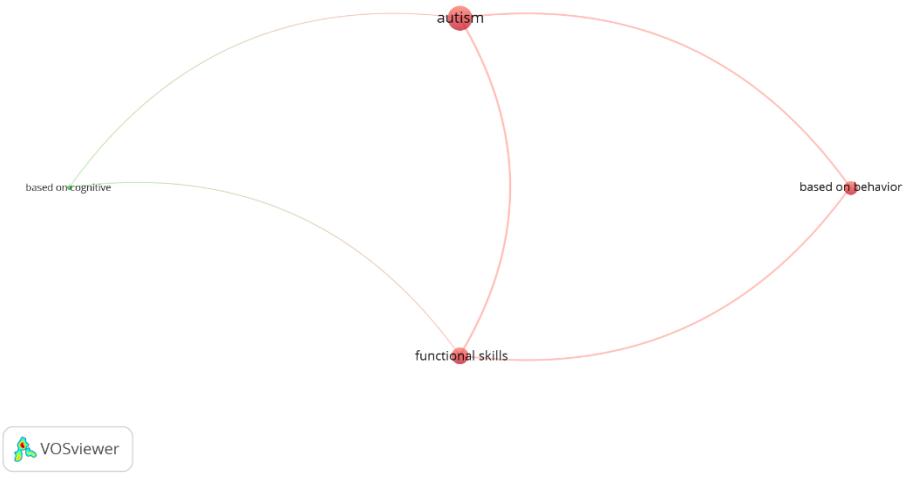

Figure 4. Intervention Used in The Selected Articles

46 articles that were selected, Intervention based on behavior were more widely used, namely 34 articles (Alaniz et al., 2017; Armendariz & Hahs, 2019; Bereznak et al., 2012; Blackwell & Stockall, 2021; Bradshaw et al., 2017; Chang et al., 2018; Davis et al., 2018; Dixon et al., 2020; Dueñas et al., 2019; Edwards et al., 2018; Finn et al., 2015; Gardner & Wolfe, 2019; Grosberg & Charlop, 2014; Halle et al., 2016; Harriage et al., 2016; Johnson et al., 2013; Kamps et al., 2015; Kandalaft et al., 2013; Kurnaz & Yanardag, 2018; Law et al., 2018; Leaf et al., 2016; C. Y. Q. Lee et al., 2014; S. Y. Lee et al., 2017; Macpherson et al., 2015; Mason et al., 2020; Miller et al., 2020; Probst & Walker, 2017; Sansi et al., 2021; Shrestha et al., 2013; So et al., 2020; Walsh et al., 2018; Wertalik & Kubina, 2018; Wilson, 2013; Yakubova & Chen, 2021). While intervention based on cognitive were used in 12 articles (Bennett et al., 2013; Bross et al., 2019; Burton et al., 2013; Godish et al., 2017; Hutchinson et al., 2019; Kim et al., 2018; Kurt & Kutlu, 2019; Ledbetter-Cho et al., 2020; McKissick et al., 2013; Munandar et al., 2021; Weng & Bouck, 2014; Yakubova et al., 2019).

RQ4. To what extent the effectiveness of each intervention in improving functional skill?

Many interventions were used to try to improve functional skills of individual with ASD. Among these interventions that were used, 86% interventions that were used to improve functional skills of individual with ASD were effective. About 4% of interventions not effective to be used to improve functional skills for individual with ASD, these interventions were aquatic group therapy that was used to improve social skill and virtual reality that were used to improve community skills for individual with ASD (Alaniz et al., 2017; Miller et al., 2020). There were also about 6% of interventions that this effectiveness resulted in mixed finding, these interventions were video prompting used to improve community skills and recreational skills, cool versus not cool that was to improve social skills and Acceptance and Commitment Therapy (ACT) and Behavioral Skills Training (BST) to improve pre-vocational skills. About 4% of intervention that can't be known fully of their effectiveness because some of the participants withdraw from the research.

The purpose of this was to identify and analysis all of previous researched about improving functional skill for individual with ASD which focused in which year that researcher published articles about improving functional skill, the type of functional skill that was researched, which intervention was used and the effectiveness of the intervention that was used in the previous researched. By using the PRISMA as a guideline for this systematic review, 46 articles were selected to be used in this article from databases Sage Journal, Scopus dan Springer Link. Previous systematic review only focused in one type functional skill (Bennett & Dukes, 2014; Radley et al., 2020) or in one media that was used to increase functional skill (Hanna et al., 2021). From 46 articles that was published during 2012–2022, with the highest released articles being published in 2018 with 8 articles were released that year. There was no article that was published on the topic of functional skills in 2022. This is

somewhat concerning as improving functional skill is important for independent living of individual with ASD, so the research still important to do.

About the type of functional skills that were researched before, improving social skills of individuals with ASD were the most researched among other types of functional skills with 14 articles. Different with social skills, pre-vocational skills and academic functional skills only researched in 2 articles. Although each type of functional skill is equally important for the independent life of children with ASD, the results of this systematic review prove that there are still certain types of functional skills that need to be improved in researching how to improve these types of functional skills for children with ASD. Regarding the intervention that was used to improve functional skill of individual with ASD, it been identified that most of intervention that used is based on behavior. While intervention that based on cognitive only been researched in 12 articles. This lack of use of cognitive-based interventions causes interventions that are used to improve the functional skills of children with ASD only focus on social-based interventions, even though interventions based on cognition are also really needed to be researched so that the interventions used will be more varied.

We also were able to categorize the effectiveness of each intervention in improving functional skill. While there were many interventions that was used to improve functional skill of individual with ASD. There were several ineffective interventions, and some of the interventions found mixed results. It is hoped that future studies will no longer use interventions that have been proven ineffective, and interventions that have mixed finding results need more in-depth research.

The Use of Video Modeling to Improve Functional Skills

Bross et al. (2019) demonstrated that individuals with ASD could improve their customer service skills by using video modeling when they were employed as a cashier at a retail store. Burton et al. (2013)indicated that an individual with ASD and intellectual disability could improve their functional math skills by learning using video self-modeling on an iPad, in the research five-item example questions was used in the intervention phase and during post-intervention phase they were using five-item different but similar questions. Data from research conducted by Lee et al. (2014) showed that video modeling could be used to improve toileting an individual with ASD, the task analysis of toileting that used in the research was walking the toilet, undressing, sitting on the toilet, eliminating in the toilet, redressing, and.

Lee et al. (2017) used video self-modeling as an intervention to teach an individual with ASD functional play skills, the intervention used showed the improvement of the skills according to the result. Shrestha (2013) demonstrated by using point-of-view video modeling can be used to improve functional self-help skills individual with ASD to serve himself an afternoon snack. Kurnaz & Yanardag (2018) researched about effectiveness of video self-modeling to improve individuals with ASD active video game skills, and the result shown the intervention is effective and active video game skills of individual with ASD improved. Based on data from research conducted by Godish et al. (2017) using video modeling could improve abduction prevention skills of individuals with ASD and all participants can maintain their skills except one participant who needed help to maintain the skills. Walsh et al. (2018) used video modeling to improve individual with ASD social skills, the result shown an improvement based on an increase of social communication skills necessary for workplace inclusion. Halle et al. (2016) indicated that an individuals with ASD could improve their social skills, a greeting response by using video modeling social stories.

Wertalik and Kubina (2018) showed that individuals with ASD could improve their daily living skills by using video modeling, based on the results of her research. Grosberg and Charlop (2014) used Portable Video Modeling Intervention (PVMI) to improve social initiation skills, the results showed the intervention could improve their skills. Based on research conducted by Duenas et al. (2019) showed video modeling could be used to improve pretend play behaviors skills of an individuals with ASD. The data from Macperson et al. (2015) research also shown portable video modeling technology could improve compliment behaviors of an individuals with ASD.

The Use of Video Prompting to Improve Functional Skills

Gardner and Wolfe (2019) indicated by using video prompting intervention package to individuals with ASD could improve their dishwashing skills and they could maintain that skills up to 3-weeks post intervention. Johnson et al. (2013) showed food-preparation skills of individuals with ASD could be improved by using teacher implemented video prompting on an iPad touch and the teacher viewed the intervention as a practical, effective, and efficient strategy. The data from Armendariz and Hahs (2019) research shown video prompting could be used to improve leisure activity skills but shown mixed result to improve social initiation skills of individual with ASD.

Weng et al. (2014) used video prompting via iPad to improve price comparison skills individual with ASD and the result shown an improvement of their skills. Research conducted by Yakubova and Chen (2021) shown an improvement of daily living skills of individuals with ASD by using parent-created and parent-implemented video prompting. Yakuboza el al. (2019) conducted research with results shown that, self-directed video prompting could improve vocational skills of individuals with ASD. Data from research conducted by Bereznak et al. (2012) shown video self-prompting via an iPhone could be used to improve vocational and daily living skills individuals with ASD.

The Use of Others Interventions to Improve Functional Skills

Miller et al. (2020) used virtual reality could be used to improve air travel skills individuals with ASD at airport, the preliminary result showed an efficacy of VR to teach basic air travel skills although further research is needed. Dixon et al. (2020) also used immersive virtual reality to improve pedestrian skills individual with ASD and the result shown the research participants reached mastery criteria. Virtual reality also used in the research conducted by Kandalaft et al. (2013) to improve social skills, social cognition, and social functioning individual with ASD, according to data these skills shown an improvement.

Davis et al. (2018) used peer-delivered simultaneous prompting to improve social skills individuals with ASD and the result shown their skills is improved. Harriage et al. (2016) research indicated parent implementation most-to-least could be used to improve pedestrian skills of an individuals with ASD. System of least prompts was used in research conducted by Probst & Walker (2017) to improve personal hygiene skills of individual with ASD, there was improvement of these skills according to data. Bennet et al. (2013) used convert audio coaching (CAC) as an intervention to improve employment skills of an individuals with ASD, based on data there's improvement of these skills. Mason et al. (2020) also used CAC in their research to improve question asking skills and the results shown their skills improved and they preferred using this intervention rather than other intervention in which they previously experienced.

Research conducted by Blackwell & Stockall (2021) shown that conversational skills of individuals with ASD could be improved by using incidental teaching as the intervention, incidental teaching can be implemented by following the RACTF (Recruit, Assess, Cueing, Teach, and Fade) process. Edwards et al. (2018) conducted research about improving functional leisure engagement skills of individuals with ASD by using backward chaining, and these skills shown improvement according to the data. Law (2018) indicted that functional communication skills of individual with ASD could be improved by using Map4speech, an mobile application that was developed for parents of children with ASD. Munandar (2021) demonstrated that an individual with ASD could improve their storytelling ability in job interviews by using video-based intervention, patterned behavior description interview (PBDI) questions was used in mock job interviews. McKissick et al. (2013) conducted research about computer-assisted explicit instruction was used to improve map-reading skills of individuals with ASD and showed an increase based the data. Cho et al. (2020) indicated teacher-implemented video-enhanced activity schedule could be used as interventions to improve mathematical skills and decrease collateral behaviors of individuals with ASD, however visual analysis indicates there was no functional relationship between the intervention package and collateral behaviors.

Robot-based play-drama was used as intervention in research conducted by So et al. (2020) to improve joint attention and functional play behaviors skills of individuals with ASD, these skills showed an improvement after using the intervention. Bradshaw et al. (2017) used parent-mediated

as intervention to improve functional language and social motivation skills of individual with ASD and according to data, these skills showed an improvement. Kurt & Kutlu (2019) examined the effect from social stories to abduction-prevention skills of individuals with ASD, it shown all participants were able to learn the target skills and able to maintain their learning. Alaniz et al. (2017) used aquatic group therapy as an intervention to improve water safety and social interaction skills of individual with ASD, although water safety skills shown an improvement but social interaction skills didn't improve.

Hutchinson et al. (2019) examined the efficacy of acceptance and commitment therapy (ACT) and behavioral skills training (BST) to improve interview skills of individual with ASD. The result shown, by using ACT there were some improvements, but BST were required for all participants to master the skills. Wilson (2013) used in vivo modeling to improve social communication skills of individuals with ASD, and according to data these skills shown an improvement. Research conducted by Sansi et al. (2021) shown inclusive physical activity could be used to improve motor skills, social skills, and positively affected the attitudes of individuals with ASD. Chang et al. (2018) indicated to improve play skills of individual of ASD, symbolic play could be used as an intervention.

Based to research conducted by Leaf et al. (2016) cool versus not cool procedure could be used to improve the social game play skills of individuals with ASD and seven of the eight participants mastered each of the games taught in the research. Kamps et al. (2015) indicated comprehensive peer network intervention could be used as intervention to improve social communication skills of individuals with ASD. Finn et al. (2015) used WatchMinder to improve on-task behavior skills of individual with ASD, and this skill showed an improvement by using that intervention. Research conducted by Kim et al (2018) about narrative story comprehension and task engagement skills of individual with ASD could be improved by using shared reading intervention.

Conclusion

46 articles that was selected from databases Sage Journal, Scopus dan Springer Link by using the PRISMA as guideline in this systematic review. Based on that, found articles about improving functional skill of individual with ASD published the most is in 2018, while in 2020 there's no articles published. Functional skills have many types, of these various types, that is the type that is most often researched is social skills, meanwhile pre-vocational skills and academic functional skills rarely researched. There are many interventions that had been used to researched about increasing functional skill of individual with ASD, however lot of them based on behavior and rarely researcher use intervention based on cognitive. And although in general the interventions used were effective, there were some interventions that were ineffective and some that had mixed results.

References

Alaniz, M. L., Rosenberg, S. S., Beard, N. R., & Rosario, E. R. (2017). The Effectiveness of Aquatic Group Therapy for Improving Water Safety and Social Interactions in Children with Autism Spectrum Disorder: A Pilot Program. Journal of Autism and Developmental Disorders, 47(12), 4006–4017. https://doi.org/10.1007/s10803-017-3264-4

Alodat, A., Muhaidat, M., Algolaylat, A., & Alzboun, A. (2020). Functional Skills among Students with Intellectual Disabilities as Perceived by Special Education Teachers in Jordan: A Preliminary Study. Ürdün'deki Özel Eğitim Öğretmenlerinin Algıladıkları Zihinsel Yetersizliği Olan Öğrencilerin İşlevsel Becerileri., 49(2), 1236–1254. https://doi.org/10.14812/cufej.584249

American Psychiatric Association. (2013). Diagnostic and Statistical Manual of Mental Disorders.

Armendariz, V., & Hahs, A. D. (2019). Teaching Leisure Activities with Social Initiations Through Video Prompting. Journal of Behavioral Education, 28(4), 479–492. https://doi.org/10.1007/s10864-019-09320-1

Beller, E. M., Glasziou, P. P., Altman, D. G., Hopewell, S., Bastian, H., Chalmers, I., Gøtzsche, P. C.,

Lasserson, T., & Tovey, D. (2013). PRISMA for Abstracts: Reporting Systematic Reviews in Journal and Conference Abstracts. PLoS Medicine, 10(4). https://doi.org/10.1371/journal.pmed.1001419

Bennett, K. D., & Dukes, C. (2014). A Systematic Review of Teaching Daily Living Skills to Adolescents and Adults with Autism Spectrum Disorder. Review Journal of Autism and Developmental Disorders, 1(1), 2–10. https://doi.org/10.1007/s40489-013-0004-3

Bennett, K. D., Ramasamy, R., & Honsberger, T. (2013). Further Examination of Covert Audio Coaching on Improving Employment Skills among Secondary Students with Autism. Journal of Behavioral Education, 22(2), 103–119. https://doi.org/10.1007/s10864-013-9168-2

Bereznak, S., Ayres, K. M., Mechling, L. C., & Alexander, J. L. (2012). Video Self-Prompting and Mobile Technology to Increase Daily Living and Vocational Independence for Students with Autism Spectrum Disorders. Journal of Developmental and Physical Disabilities, 24(3), 269–285. https://doi.org/10.1007/s10882-012-9270-8

Blackwell, W., & Stockall, N. (2021). Incidental Teaching of Conversational Skills for Students With Autism Spectrum Disorder. Teaching Exceptional Children, 54(2), 116–123. https://doi.org/10.1177/0040059921990405

Bradshaw, J., Koegel, L. K., & Koegel, R. L. (2017). Improving Functional Language and Social Motivation with a Parent-Mediated Intervention for Toddlers with Autism Spectrum Disorder. Journal of Autism and Developmental Disorders, 47(8), 2443–2458. https://doi.org/10.1007/s10803-017-3155-8

Bross, L. A., Travers, J. C., Munandar, V. D., & Morningstar, M. (2019). Video Modeling to Improve Customer Service Skills of an Employed Young Adult With Autism. Focus on Autism and Other Developmental Disabilities, 34(4), 226–235. https://doi.org/10.1177/1088357618805990

Browder, D. M., & Spooner, F. (2011). Teaching Students with Moderate and Severe Disabilities. The Guilford Press.

Burton, C. E., Anderson, D. H., Prater, M. A., & Dyches, T. T. (2013). Video self-modeling on an ipad to teach functional math skills to adolescents with autism and intellectual disability. Focus on Autism and Other Developmental Disabilities, 28(2), 67–77. https://doi.org/10.1177/1088357613478829

Carnahan, C. R., Hume, K., Clarke, L., & Borders, C. (2009). Using Structured Work Systems to Promote Independence and Engagement for Students with Autism Spectrum Disorders. TEACHING Exceptional Children, 41(4), 6–14. https://doi.org/10.1177/004005990904100401

Chang, Y. C., Shih, W., Landa, R., Kaiser, A., & Kasari, C. (2018). Symbolic Play in School-Aged Minimally Verbal Children with Autism Spectrum Disorder. Journal of Autism and Developmental Disorders, 48(5), 1436–1445. https://doi.org/10.1007/s10803-017-3388-6

Davis, M. A. C., Spriggs, A., Rodgers, A., & Campbell, J. (2018). The Effects of a Peer-Delivered Social Skills Intervention for Adults with Comorbid Down Syndrome and Autism Spectrum Disorder. Journal of Autism and Developmental Disorders, 48(6), 1869–1885. https://doi.org/10.1007/s10803-017-3437-1

Dijkhuis, R., de Sonneville, L., Ziermans, T., Staal, W., & Swaab, H. (2020). Autism Symptoms, Executive Functioning and Academic Progress in Higher Education Students. Journal of Autism and Developmental Disorders, 50(4), 1353–1363. https://doi.org/10.1007/s10803-019-04267-8

Dixon, D. R., Miyake, C. J., Nohelty, K., Novack, M. N., & Granpeesheh, D. (2020). Evaluation of an Immersive Virtual Reality Safety Training Used to Teach Pedestrian Skills to Children With Autism Spectrum Disorder. Behavior Analysis in Practice, 13(3), 631–640. https://doi.org/10.1007/s40617-019-00401-1

Dueñas, A. D., Plavnick, J. B., & Bak, M. Y. S. (2019). Effects of Joint Video Modeling on Unscripted Play Behavior of Children with Autism Spectrum Disorder. Journal of Autism and Developmental Disorders, 49(1), 236–247. https://doi.org/10.1007/s10803-018-3719-2

Edwards, C. K., Landa, R. K., Frampton, S. E., & Shillingsburg, M. A. (2018). Increasing Functional Leisure Engagement for Children With Autism Using Backward Chaining. Behavior Modification, 42(1), 9–33. https://doi.org/10.1177/0145445517699929

Estes, A., Munson, J., Dawson, G., Koehler, E., Zhou, X. H., & Abbott, R. (2009). Parenting stress and psychological functioning among mothers of preschool children with autism and developmental

delay. Autism, 13(4), 375–387. https://doi.org/10.1177/1362361309105658
Finn, L., Ramasamy, R., Dukes, C., & Scott, J. (2015). Using WatchMinder to Increase the On-Task Behavior of Students with Autism Spectrum Disorder. Journal of Autism and Developmental Disorders, 45(5), 1408–1418. https://doi.org/10.1007/s10803-014-2300-x
Gardner, S. J., & Wolfe, P. S. (2019). Results of a Video Prompting Intervention Package Impacting Dishwashing Skill Acquisition for Adolescents With Autism. Journal of Special Education Technology, 34(3), 147–161. https://doi.org/10.1177/0162643418802666
Godish, D., Miltenberger, R., & Sanchez, S. (2017). Evaluation of Video Modeling for Teaching Abduction Prevention Skills to Children with Autism Spectrum Disorder. Advances in Neurodevelopmental Disorders, 1(3), 168–175. https://doi.org/10.1007/s41252-017-0026-4
Grosberg, D., & Charlop, M. (2014). Teaching Persistence in Social Initiation Bids to Children with Autism Through a Portable Video Modeling Intervention (PVMI). Journal of Developmental and Physical Disabilities, 26(5), 527–541. https://doi.org/10.1007/s10882-013-9362-0
Halle, S., Ninness, C., Ninness, S. K., & Lawson, D. (2016). Teaching Social Skills to Students with Autism: a Video Modeling Social Stories Approach. Behavior and Social Issues, 25(1), 42–54. https://doi.org/10.5210/bsi.v25i0.6190
Hanna, N., Lydon, H., Holloway, J., Barry, L., & Walsh, E. (2021). Apps to Teach Social Skills to Individuals with Autism Spectrum Disorder: A Review of the Embedded Behaviour Change Procedures. Review Journal of Autism and Developmental Disorders, 2010. https://doi.org/10.1007/s40489-021-00271-w
Harriage, B., Blair, K. S. C., & Miltenberger, R. (2016). An Evaluation of a Parent Implemented In Situ Pedestrian Safety Skills Intervention for Individuals with Autism. Journal of Autism and Developmental Disorders, 46(6), 2017–2027. https://doi.org/10.1007/s10803-016-2730-8
Hutchinson, V. D., Rehfeldt, R. A., Hertel, I., & Root, W. B. (2019). Exploring the Efficacy of Acceptance and Commitment Therapy and Behavioral Skills Training to Teach Interview Skills to Adults with Autism Spectrum Disorders. Advances in Neurodevelopmental Disorders, 3(4), 450–456. https://doi.org/10.1007/s41252-019-00136-8
Johnson, J. W., Blood, E., Freeman, A., & Simmons, K. (2013). Evaluating the effectiveness of teacher-implemented video prompting on an iPod Touch to teach food-preparation skills to high school students with autism spectrum disorders. Focus on Autism and Other Developmental Disabilities, 28(3), 147–158. https://doi.org/10.1177/1088357613476344
Kamps, D., Thiemann-Bourque, K., Heitzman-Powell, L., Schwartz, I., Rosenberg, N., Mason, R., & Cox, S. (2015). A Comprehensive Peer Network Intervention to Improve Social Communication of Children with Autism Spectrum Disorders: A Randomized Trial in Kindergarten and First Grade. Journal of Autism and Developmental Disorders, 45(6), 1809–1824. https://doi.org/10.1007/s10803-014-2340-2
Kandalaft, M. R., Didehbani, N., Krawczyk, D. C., Allen, T. T., & Chapman, S. B. (2013). Virtual reality social cognition training for young adults with high-functioning autism. Journal of Autism and Developmental Disorders, 43(1), 34–44. https://doi.org/10.1007/s10803-012-1544-6
Kim, S. Y., Rispoli, M., Lory, C., Gregori, E., & Brodhead, M. T. (2018). The Effects of a Shared Reading Intervention on Narrative Story Comprehension and Task Engagement of Students with Autism Spectrum Disorder. Journal of Autism and Developmental Disorders, 48(10), 3608–3622. https://doi.org/10.1007/s10803-018-3633-7
Kurnaz, E., & Yanardag, M. (2018). The Effectiveness of Video Self-Modeling in Teaching Active Video Game Skills to Children with Autism Spectrum Disorder. Journal of Developmental and Physical Disabilities, 30(4), 455–469. https://doi.org/10.1007/s10882-018-9596-y
Kurt, O., & Kutlu, M. (2019). Effectiveness of Social Stories in Teaching Abduction-Prevention Skills to Children with Autism. Journal of Autism and Developmental Disorders, 49(9), 3807–3818. https://doi.org/10.1007/s10803-019-04096-9
LaRue, R. H., Manente, C. J., Dashow, E., & Sloman, K. N. (2016). Functional Skills. Handbook of Evidence-Based Practices in Intellectual and Developmental Disabilities. https://doi.org/0.1007/978-3-319-26583-4_9
Law, G. C., Neihart, M., & Dutt, A. (2018). The use of behavior modeling training in a mobile app parent

training program to improve functional communication of young children with autism spectrum disorder. Autism, 22(4), 424–439. https://doi.org/10.1177/1362361316683887

Leaf, J. A., Leaf, J. B., Milne, C., Townley-Cochran, D., Oppenheim-Leaf, M. L., Cihon, J. H., Taubman, M., McEachin, J., & Leaf, R. (2016). The Effects of the Cool Versus Not Cool Procedure to Teach Social Game Play to Individuals Diagnosed with Autism Spectrum Disorder. Behavior Analysis in Practice, 9(1), 34–49. https://doi.org/10.1007/s40617-016-0112-5

Ledbetter-Cho, K., O'Reilly, M., Watkins, L., Lang, R., Lim, N., Davenport, K., & Murphy, C. (2020). The Effects of a Teacher-Implemented Video-Enhanced Activity Schedule Intervention on the Mathematical Skills and Collateral Behaviors of Students with Autism. Journal of Autism Ands Developmental Disorders. https://doi.org/10.1007/s10803-020-04495-3

Lee, C. Y. Q., Anderson, A., & Moore, D. W. (2014). Using Video Modeling to Toilet Train a Child with Autism. Journal of Developmental and Physical Disabilities, 26(2), 123–134. https://doi.org/10.1007/s10882-013-9348-y

Lee, S. Y., Lo, Y. yu, & Lo, Y. (2017). Teaching Functional Play Skills to a Young Child with Autism Spectrum Disorder through Video Self-Modeling. Journal of Autism and Developmental Disorders, 47(8), 2295–2306. https://doi.org/10.1007/s10803-017-3147-8

Macpherson, K., Charlop, M. H., & Miltenberger, C. A. (2015). Using Portable Video Modeling Technology to Increase the Compliment Behaviors of Children with Autism During Athletic Group Play. Journal of Autism and Developmental Disorders, 45(12), 3836–3845. https://doi.org/10.1007/s10803-014-2072-3

Mason, R. A., Gregori, E., Wills, H. P., Kamps, D., & Huffman, J. (2020). Covert Audio Coaching to Increase Question Asking by Female College Students with Autism: Proof of Concept. Journal of Developmental and Physical Disabilities, 32(1), 75–91. https://doi.org/10.1007/s10882-019-09684-2

McKissick, B. R., Spooner, F., Wood, C. L., & Diegelmann, K. M. (2013). Effects of computer-assisted explicit instruction on map-reading skills for students with autism. Research in Autism Spectrum Disorders, 7(12), 1653–1662. https://doi.org/10.1016/j.rasd.2013.09.013

Miller, I. T., Wiederhold, B. K., Miller, C. S., & Wiederhold, M. D. (2020). Virtual Reality Air Travel Training with Children on the Autism Spectrum: A Preliminary Report. Cyberpsychology, Behavior, and Social Networking, 23(1), 10–15. https://doi.org/10.1089/cyber.2019.0093

Mumpuniarti, & Pujaningsih. (2016). Pembelajaran Akademik Fungsional dalam Konteks Pendidikan Khusus Orientasi Budaya (1st ed.). UNY Press.

Munandar, V. D., Bross, L. A., Zimmerman, K. N., & Morningstar, M. E. (2021). Video-Based Intervention to Improve Storytelling Ability in Job Interviews for College Students With Autism. Career Development and Transition for Exceptional Individuals, 44(4), 203–215. https://doi.org/10.1177/2165143420961853

Neely, L. C., Ganz, J. B., Davis, J. L., Boles, M. B., Hong, E. R., Ninci, J., & Gilliland, W. D. (2016). Generalization and Maintenance of Functional Living Skills for Individuals with Autism Spectrum Disorder: a Review and Meta-Analysis. Review Journal of Autism and Developmental Disorders, 3(1), 37–47. https://doi.org/10.1007/s40489-015-0064-7

Pierce, K. L., & Schreibman, L. (1994). Teaching Daily Living Sskills to Children with Autism in Unsupervised Settings through Pictorial self-Management. Journal of Applied Behavior Analysis, 3(27), 471–481.

Probst, K. M., & Walker, V. L. (2017). Using the system of least prompts to teach personal hygiene skills to a high school student with comorbid visual impairment and autism spectrum disorder. Journal of Visual Impairment and Blindness, 111(6), 511–525. https://doi.org/10.1177/0145482x1711100603

Radley, K. C., Dart, E. H., Brennan, K. J., Helbig, K. A., Lehman, E. L., Silberman, M., & Mendanhall, K. (2020). Social Skills Teaching for Individuals with Autism Spectrum Disorder: a Systematic Review. Advances in Neurodevelopmental Disorders, 4(3), 215–226. https://doi.org/10.1007/s41252-020-00170-x

Sansi, A., Nalbant, S., & Ozer, D. (2021). Effects of an Inclusive Physical Activity Program on the Motor Skills, Social Skills and Attitudes of Students with and without Autism Spectrum Disorder. Journal

of Autism and Developmental Disorders, 51(7), 2254–2270. https://doi.org/10.1007/s10803-020-04693-z

Shrestha, A., Anderson, A., & Moore, D. W. (2013). 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, 22(2), 157–167. https://doi.org/10.1007/s10864-012-9165-x

Simpson, R. L., & Myles, B. S. (2011). Asperger Syndrome and High-Functioning Autism: A Guide for Effective Practice 3rd Edition. Pro Ed.

So, W. C., Cheng, C. H., Lam, W. Y., Huang, Y., Ng, K. C., Tung, H. C., & Wong, W. (2020). A Robot-Based Play-Drama Intervention May Improve the Joint Attention and Functional Play Behaviors of Chinese-Speaking Preschoolers with Autism Spectrum Disorder: A Pilot Study. Journal of Autism and Developmental Disorders, 50(2), 467–481. https://doi.org/10.1007/s10803-019-04270-z

Storey, K., & Miner, C. (2011). Systematic Instruction of Functional Skills for Students and Adults with Disabilities. CHARLES C THOMAS • PUBLISHER, LTD.

Szyndler, J. (1996). Toileting Problems in a Group of Children with Autism. Child Psychology & Psychiarry Review, 1(1). https://doi.org/10.1177/105381519101500211

Volkmar, F. R., & Pauls, D. (2003). Autism. Lancet, 362(9390), 1133–1141. https://doi.org/10.1016/S0140-6736(03)14471-6

Walsh, E., Holloway, J., & Lydon, H. (2018). An Evaluation of a Social Skills Intervention for Adults with Autism Spectrum Disorder and Intellectual Disabilities preparing for Employment in Ireland: A Pilot Study. Journal of Autism and Developmental Disorders, 48(5), 1727–1741. https://doi.org/10.1007/s10803-017-3441-5

Weng, P. L., & Bouck, E. C. (2014). Using video prompting via iPads to teach price comparison to adolescents with autism. Research in Autism Spectrum Disorders, 8(10), 1405–1415. https://doi.org/10.1016/j.rasd.2014.06.014

Wertalik, J. L., & Kubina, R. M. (2018). Comparison of TAGteach and Video Modeling to Teach Daily Living Skills to Adolescents with Autism. Journal of Behavioral Education, 27(2), 279–300. https://doi.org/10.1007/s10864-017-9285-4

Wilson, K. P. (2013). Teaching social-communication skills to preschoolers with autism: Efficacy of video versus in vivo modeling in the classroom. Journal of Autism and Developmental Disorders, 43(8), 1819–1831. https://doi.org/10.1007/s10803-012-1731-5

Yakubova, G., & Chen, B. B. (2021). Examining the Effects of Parent-Created and Parent-Implemented Video Prompting to Teach Daily Living Skills to an Adolescent with Autism. Journal of Autism and Developmental Disorders, 51(12), 4679–4691. https://doi.org/10.1007/s10803-021-04913-0

Yakubova, G., Leibowitz, L., Baer, B. L., Halawani, N., & Lestremau, L. (2019). Self-Directed Video Prompting and Least-to-Most Prompting: Examining Ways of Increasing Vocational Skill Acquisition Among Students with Autism Spectrum Disorder and Intellectual Disability. Advances in Neurodevelopmental Disorders, 3(3), 246–258. https://doi.org/10.1007/s41252-019-0097-5