Development of a Basic Work Skills Assessment Tool for Adolescents with Autism

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Abstract

The purpose of this study was to develop a basic work skills assessment tool for adolescents with a diagnosis of autism through content validity, and interrater and intrarater reliability using Intraclass Correlation Coefficient (ICC). This tool was developed from a literature review and was verified by face validity. The resultant tool included 2 components: 1) a set of three tasks measuring work abilities and work attitudes, and 2) a form to record the number of prompts. Six adolescents with autism aged 13-16 years were selected by purposive sampling according to the certain criteria. Two raters observed the work task performance of each participant and recorded the number of prompts in order to analyze interrater reliability. After 2 weeks of allowing for wash out effect, one rater who was also the tester repeated the same process, and then intrarater reliability was calculated. The ICCs of Interrater reliability in scores of work abilities, and work attitudes, and total scores were in high levels (.93, 1.00 and .93 respectively). The ICCs of intrarater reliability in scores of work abilities, work attitudes and total scores were moderate (.54, .64 and .74. respectively). Because of its moderate to high reliability, the interrater reliability was acceptable but intrarater reliability was not.

Keywords : Adolescents with Autism, Assessment tool, Basic work skills

Introduction

The ministry of Public Health of Thailand reported that the number of children and adolescents age 0-18 years with a diagnosis of autism increased to almost 200,000, a significant growth over the past decade. Because only fifteen percent of these can access health care services, the Ministry of Public Health will provide around 10,000 hospitals for screening children with autism spectrum disorder (Thairath online, 2014). To respond to this increase, more intervention services for adolescents with autism should be provided. A study on the changes in families with adolescents who have autism showed that 56.7 % of parents felt anxious and stressful about the future after they passed away. Half of the parents felt uncertain for the future of their offspring who have autism. Around one third were concerned with job prospects and afraid that firms or organizations would not hire their child with autism. This study recommended intervention for affected families focusing on daily life and mental health especially in providing work (Boonmak, 2010). To improve quality of life for individuals with autism and their families, work should be a major concern to related professionals. Most people with a moderate to high functioning form of autism can work if they receive support, training and meaningful jobs appropriate to their individual characteristics. If prevocational skills are provided in an appropriate environment through work training, they can acquire life skills and readiness

for work. Typically, skills received from educational institutions do not transition well to work places. (Howlin, 2004). Sellers (2007) showed that transitions from vocational rehabilitation were preferable to those of education when predicting successful employment.

Development of basic skills for work is necessary for people with autism to both gain employment and to keep it (Howlin, 2004). To develop work skills, specific behaviors related to people with autism should be considered such as spending time with objects and non-human environments rather than interaction with humans. People with autism tend to follow their own needs more than the needs of others. They typically have little interest in group activities or group participation which presents problems both in relationships and in working with others. However, they have a lot of interests in specific areas, perceive information precisely, and can observe and remember things that the others cannot observe or remember. In addition, their interests may not be the same as normal people (Tyler, 2007). For example, they are interested in clear figures or features such as obvious objects, numbers or symbols, and in organizing things from simple to complex with certain sequences. They tend to arrange things into groups or use symbols and are more focused on predictable outcomes rather than on those with uncontrollable or unpredictable ones (Tyler, 2007: Ministry of Education, 2000). The appropriate work environment for people with autism should be structured, organized, predictable (Miroslava, 2011), and use visual-perceptual tasks (Mottron, Dawson, Soulieres, Hubert &Burack, 2006). If the structure of their work includes these related skills both an increase in social communication and a reduction in maladaptive behaviors can be expected (Miroslava, 2011). The work skills assessment tools developed in western countries include 1) Scales of Independent Behavior-revised (SIB-R) a subscale of work skill including work habits and selected prevocational skills (Bruininks, Woodcock, Weatherman & Hill, 1996), which are assessed through interviewing caregivers and, 2) The Autism Work Skills Questionnaire (AWSQ), which is assessed through interviewing adults with autism who have 10 to 12 years of education (Gal, Meir & Katz, 2013). In addition, there is a Prevocational Checklist developed by Brown, LaRoe & Neuman, 1977 to assess vocational readiness using observations in work simulations. Typically, vocational assessment techniques include interviewing parents, people with autism, and the teachers and professionals who work with this population. Alternatively, those with higher functioning on the autism spectrum are able to complete vocational interests and work attitudes via writing. They also may perform functional academics and manual dexterity tests or their behaviors might be observed relative to work performed in work stimulations of real work environments (Brolin, 1982; Peterson & Hill, 1982; Sitlington, 1981). Even though the Thai Department of mental health upholds its policy to promote work for people with autism, it acknowledges that there is no basic work skills assessment tool (Department of mental Health, 2014). Mental health institutions focus on intervention for maladaptive behaviors and self-care (Department of mental Health, 2014) while special education institutions provide vocational training for adolescents with diverse special needs not limited to autism (Thai bureau of special education administration, 2013). Although the Autism Foundation of Thailand promotes vocational skills for its constituents, there is no basic work skills assessment tool to examine basic competence in adolescents with autism who will explore career paths in the future. This assessment tool is crucial to determine basic work skills which are necessary for work performance in order to achieve vocational success. Therefore, it is necessary to develop a basic work skills

assessment tool that can assess basic competencies of adolescents with autism, ones that could contribute to the work potentials of this group.

Objectives

The purpose of this study was to develop a basic work skills assessment tool for adolescents with autism through content validity, and interrater and intrarater reliability using an Intraclass Correlation Coefficient.

Methods

This quantitative study was undertaken to develop an assessment tool and received human ethics approval from the committees of Faculty of Associated Medical Sciences, Chiang Mai University before commencing.

Operational definition

1. Adolescents with autism refer to person's aged 12 to 19 years who have been diagnosed with Autism Spectrum Disorder by medical doctors in Chiang Mai.
2. Basic work skills refer to skills necessary to work including work abilities and work attitudes.

2.1 Work abilities refer to integration of cognitive function necessary in the work process which consist of 2 components (Perry, 2013):

- Individual competency includes visual discrimination, spatial relations, eye-hand coordination, filling and sorting (Perry, 2013; Sitlington, Dalrymple & Dewees , 1986) which are necessary for basic work.
- Work components include: initiating and terminating work; working repetitively; following sequences of work; maintaining work until finished; using materials and tools necessary to work; and, copying an example (Perry, 2013; Sitlington, Dalrymple & Dewees, 1986; Bruininks, Woodcock, Weatherman & Hill, 1996)

2.2 Work attitudes refer to appropriate perspectives to work such as: seeking help for work tasks when needed; demonstrating responsible behavior on the job by completing work tasks and putting away tools; and, appropriate communication about not-understanding the task or procedures by tapping or pointing.

3. Basic work skills assessment tool refers to an assessment tool consisting of:

3.1 Tasks measuring all items of work abilities and work attitudes.

3.2 A work abilities and work attitudes form on which was recorded the number of prompts.

Population

Population consisted of 14 adolescents' aged 12 to 19 years with a diagnosis of autism who were members of the Autism Network of Chiang Mai municipality.

Subjects

Six subjects were selected using purposive sampling as follows:

1. They could understand instructions and perform tabletop activities for 30 minutes from the reports of two occupational therapists.
2. They could look after themselves in self-care from reports of parents and occupational therapists.
3. They and their parents were willing to participate in the research. The adolescents with autism signed assent forms and their parents signed consent forms.

Procedure

1. Developed a record form of work abilities and work attitudes by extracting task items from literature reviews and modifying relevant assessment tools such as Scale of Independent Behaviors-Revised (SIB-R) in a subscale of work skills with permission (Bruininks, Woodcock, Weatherman &Hill,1996). Adapted the Autism Work Skills

Questionnaire, AWSQ (Gal, Meir& Katz, 2013), Prevocational Checklist of Brown, LaRoe & Neuman (1977), and Self-developed Work Samples and Situational Assessment Instruments (Sitlington, Dalrymple & Dewees, 1986), which records the number of prompts.

2. Developed tasks to assess basic work skills which an examiner observed and recorded on the record form of work abilities and work attitudes.

3. The first draft of the basic work skills assessment tool included 3 task models with different levels of difficulty according to the 3 levels (level 3, 4, 5) of the Cognitive Disability Frame of Reference (Allen, 2013) and the record form of work abilities and work attitudes. This tool was examined for content validity by 3 experts including two occupational therapy academics and one occupational therapy practitioner who have worked with adolescents with autism for at least 3 years. Three experts (as opposed to two) were used to avoid any deadlocks.

4. The research team improved the first draft of the assessment tool according to the comments of the experts and subsequently developed a second draft.

5. The second draft was used to examine the same 6 subjects to compile the ICC statistics for analysis. Each subject selected a task model appropriate to their ability and performed the task. While each subject was performing each task, two occupational therapist raters recorded the numbers of prompts at the same time. One was an examiner and a researcher, and the other one was the rater who already received training to use this tool.

6. The examiner examined the same 6 subjects again after 2 weeks and recorded the numbers of prompts.

7. The sum of prompts from the two raters were computed separately for interrater reliability using Intraclass Correlation Coefficient model 2 (Portney & Watkins, 2000).

8. The ratio scale data of the first and second record forms of the same 6 subjects from the examiner were computed separately for intrarater reliability using Intraclass Correlation Coefficient model 3 (Portney & Watkins, 2000).

9. Utilize results of interrater and intrarater reliability to improve the basic work skills assessment tool.

Results

The resultant basic work skills assessment tool includes instructions, 3 task models and the record form including 5 work ability items and 10 work attitude items. The data resulting from statistical analysis is shown in Table 1 and Table 2.

Table 1: Demographic characteristics of subjects

	Numbers	Percent
Gender		
Male	4	66.70
Female	2	33.30
Total	6	100.00
Ages (years)		
13	4	66.70
14	1	16.65
16	1	16.65
Total	6	100.00

Table 1 shows demographic characteristics of 6 subjects who were aged 13-16 years. Most of them (66.70%) were age 13 and male.

Table 2: Interrater and Intrarater reliabilities of work abilities, work attitudes and total using Intraclass Correlation Coefficient (ICC)

Items	Interrater reliability ICC	Intrarater reliability ICC
Work abilities	.93	.54
Work attitudes	1.00	.64
Total	.93	.74

Table 2 showed Interrater reliability using ICC which ranged from .93 to 1.00, and Intrarater reliability using ICC which ranged from .54 to .74. ($p<.05$).

Discussion

Interrater reliability coefficients of work abilities, work attitudes and total were high. However, intrarater reliability coefficients of work abilities and work attitudes were moderate, but that of the total was moderate to high according to a general guideline (Portney & Watkin, 2000). It was noteworthy that interrater reliability of work attitudes was 1.00 which means that two raters absolutely agreed with each other. The items in work attitudes included verbal communication and expression which examinees had to perform both verbally and non-verbally, and these behaviors may provoke the examiner to prompt verbally or obviously to the examinees. Hence, these prompts might be easy for the other rater to observe. For work abilities, the examinees do not need to express verbal behaviors and the examiner may not show the prompt obviously. Therefore, some prompts might not be easy for the other rater to observe. The interrater values indicated a clearly greater reliability. The repeated tests of all examinees

occurred after 2 weeks. Due to the experience of the examinees after performing the first test, the subsequent scores may have been affected. In addition, the mood of the examinees may have been different when repeated (Davidshofer & Murphy, 2005). The differences in participants' performance have the potential to alter their performances between sessions (Yik, Fiona, Joet, Kim & Rana, 2014). Therefore, the examinees' performances can change. In addition, because this tool assesses performance of the same examinees twice, the examiner can remember the first scores (Portney& Watkins, 2000). It is possible that the examiner may remember either prompts or scores of the first test either due to the small number of examinees or the easy criterion of scoring by prompt. For these reasons, it is likely that ICCs of Intrarater reliability were lower than those of Interrater reliability.

Both intrarater reliability coefficients of work abilities and work attitudes were in the moderate level (.54 and .64). ICC of work abilities was lower than that of work attitudes, which may be because of the influence of experience as discussed above. Even though 2 weeks were considered long enough to eliminate a memory effect (Portney& Watkins, 2000), it is possible that the examinees can actually improve their individual competency from therapy sessions and schools. Due to learning experience, the examinees could perform their tasks so that the examiners might need fewer prompts. Work attitudes require more social and communicative skills in performance than work abilities. Social and communicative skills may need longer time for learning experience. It is possible that work attitudes change less than work abilities. Therefore, number of prompts of the examiners in work attitudes may not be much different between tests. Apart from these, most subjects aged 13 and 14 who are early adolescents, are likely to differ in their development than those of middle and late adolescents (Keawkungwal, 2010). The varied developments of subjects who are early, middle and late adolescents may affect their performance on the test and the prompts of the raters. These influences might alter the inter and intra reliabilities.

Conclusions

To sum up, the total coefficient of interrater reliability was high while that of intrarater reliability was moderate. Because interrater reliability indicates consistency of raters, and intrarater reliability reflects the stability of the test over time, the basic work skills assessment tool is acceptable for interrater reliability but not for intrarater reliability.

Recommendations

The limitations of this study are as follows: first, a small number of subjects were recruited in this study and most them were male early adolescents, hence these participants could not be representative of all adolescents with a diagnosis of autism; second, because one examiner was also a researcher and a rater, the other rater may have been influenced. For this reason, future research should address the above limitations by examining reliability using a larger number of adolescents on the autism spectrum whose ages are more varied and use raters who are not both an examiner and a researcher.

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