

The Validity and Reliability of the Occupational Performance Questionnaire

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ABSTRACT:

Purpose: In this study, it was aimed to examine the validity and reliability of the Turkish version of the Occupational Performance Questionnaire (OPQ) in individuals aged 3-6 with autism spectrum disorder.

Material and Methods: After the questionnaire was translated into Turkish, it was applied to 51 parents with a child diagnosed with autism spectrum disorder aged 3-6 years. Cronbach Alpha coefficient was used to determine reliability. Correlation analysis with identical forms was used to establish the construct validity. In this context, correlation status of Occupational Performance Questionnaire with Sensory Profile Questionnaire and Parental Stress Index- Short Form were evaluated.

Results: The Cronbach Alpha value for the Occupational Performance Questionnaire was found to be highly reliable as "0.93". In the correlation analysis between the main sections and sub-sections of the Occupational Performance Questionnaire and identical forms; significant correlation was found with all of the main sections, and sub-sections were found to have significant relationships other than "sleep, peer and group interaction, individual and group play" sections.

Conclusion: The Occupational Performance Questionnaire is valid and reliable for Turkish children diagnosed with autism spectrum disorder aged 3-6.

Keywords: Occupational performance, Validity, Reliability, Autism Spectrum Disorder

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INTRODUCTION

Autism Spectrum Disorder (ASD) has been defined in DSM-V (Diagnostic and Statistical Manual of Mental Disorders) as a neurodevelopmental disorder characterized by difficulties in social communication, limitation of repetitive behaviour patterns, and the presence of interests and activities (APA, 2013). The prevalence of ASD in Turkey is unknown. According to 2014 data of the Ministry of Education, there are 16,837 children with ASD at the age of compulsory education (Ministry of Education, 2016). According to 2018 data of the Ministry of Health, 107,834 people, 82,079 men and 25,755 women, were diagnosed with ASD (The Ministry of Health, 2018).

The international prevalence of ASD was found to be 1:54, according to 2016 data obtained from the Centres for Disease Control and ASD Prevention (Maenner et al., 2020). In Turkey, individuals with ASD in 3-6, 7-11, and 12-15 age groups are educated in special education classes (The Ministry of Education, 2012). In addition, 53.2% of special education and rehabilitation centres in Turkey also offer support training to individuals with ASD (Official newspaper, 2016). Although the history of Occupational Therapy (OT) is not very old in Turkey, where there are a substantial number of individuals with ASD, occupational therapists have been actively involved in ASD rehabilitation in recent years.

There are sensory differences between ASD diagnostic criteria (APA, 2013). Sensory differences cause performance and participation problems in children's daily life, self-care, productivity, leisure and play activities (Jasmin et al., 2009). The lack of occupational performance in early children with ASD is common problem faced by parents (Allik et al. 2006). OT intervention offered to children with ASD does indeed lead to improved occupational performance (Jacklin et al., 2006). But there is a lack of evidence to show that OT intervention improves occupational performance. Therefore, therapists need valid outcome measures that they can use (Miller-Kuhaneck et al., 2004). In children diagnosed with ASD, these activity performance problems are generally evaluated with Canadian Occupational Performance Measurement (Law et al., 1994), but these measurements do not investigate the problems related to behaviours especially in children with ASD, by evaluating the degree of parental satisfaction, uses the reported information (Wallace, Franzsen, & Potterton, 2016). Occupational Therapist Kerry Wallace and colleagues, considering that there was a lack of evidence to support children with ASD that Occupational therapy intervention led to improvement in occupational performance, and valid results criteria were needed for therapists to evaluate the effectiveness of the intervention in occupational performance. Following they conducted the Occupational Performance Questionnaire (OPQ) in 2016 (Wallace et al., 2016). On the other hand, parents of children with ASD have higher rates of psychological distress than parents of children with other developmental disabilities (Fombonne, 2003). In occupational therapy interventions, programming not only for the child but also for reducing the stress level of the parents will increase the efficiency of the session. OPQ is applied to children with 3-6 years of age, who have undergone occupational therapy intervention using sensory integration technique. It aims to evaluate the pre-school skills in daily life activities including personal care, play and social interaction areas, to monitor the development of these skills, as well as to examine the effect of any improvement in these skills on the level of family harmony and mother's stress (Wallace et al., 2016).

The purpose of this study is to create the Turkish translation and cultural adaptation of the OPQ and to examine its validity and reliability in individuals aged 3-6 with ASD.

MATERIAL and METHODS

Purpose and Type of the Study

The purpose of this study is to create the Turkish translation and cultural adaptation of the OPQ and to examine its validity and reliability in individuals aged 3-6 with ASD.

Sampling and participant

This study was carried out with parents of 51 children aged 3-6 years, who were diagnosed with ASD, who were studying in special education and rehabilitation centre. All cases were evaluated by an occupational therapist who has three years of experience in the field. While determining the sample size in the study, the study that developed the scale made by Kerry Wallace and colleagues was taken into consideration (Wallace et al., 2016). The study was completed with 51 participants.

Data Collection Tools

The evaluation was made only once, and all participants were administered the Dunn Sensory Profile (SP), Parental Stress Index-Short Form (ESI-short form) and Occupational Performance Questionnaire (OPQ) sections 1 and 2.

Occupational Performance Questionnaire (OPQ): The scale consists of 3 parts with different question contents. Section 1 includes demographic information and medical history about the child. Section 2 includes questions that investigate the level of Occupational Performance and its impact on family members. Section 3 is the section where the effectiveness of therapy is evaluated after therapy. In this study, the reliability of the first two parts of the scale was investigated. Part 3, which was used to evaluate the effect of 1-year sensory integration therapy on the child, could not be included in the study due to the time barrier. In the OPQ, evaluation of the Occupational Performance is carried out in Section 2. This section consists of 11 items and sub-parameters of these items. Each item is a Likert-type scale designed to score within the range of 1-5. For

each question, the person filling the scale is asked to tick the box corresponding to the words "almost never", "rarely", "sometimes", "often" and "always". For the positively expressed questions in the scale, "Always" is scored with 5 points and "Never" with 1 point. In addition, "Always" is scored with 1 point and "Never" with 5 points for negative expressive questions in the scale. The high score obtained from the scale indicates high success in Occupational Performance Areas and low parental stress of the family. It takes 12-15 minutes for a person to complete the scale and the scale is filled by parents with children with ASD (Wallace, Franzsen, & Potterton, 2016).

Sensory Profile (SP): It was developed by the Occupational Therapist Winnie Dunn (Kientz & Dunn, 1997). It is used to measure the sensory processing abilities of children aged 3-10. It consists of 125 questions in total. It consists of 3 sections as "Sensory Processing", "Modulation", "Behavioural and Emotional Responses" and 14 sub-sections covered by these sections. The survey was completed by the child's caregiver or parent. This scale can be used in all disability groups. The Turkish version study was carried out by Kayihan et al in 2015 (Kayihan et al., 2015).

Parental Stress Index-Short Form (PSI-SF): It was developed by Abidin (Abidin, 1983). The purpose of the scale is to measure the severity of parents' stress from their parenting roles. The scale was originally developed as 120 items, while the short form of the scale was developed in subsequent studies. This short form consists of 3 sub-sections, namely "Parental Distress", "Parent-Child Dysfunctional Interaction" and "Difficult Child" and consists of 36 questions in total. The validity and reliability study of the scale was adapted to Turkish by Mert, Hallioglu, Ankaralı, Camdeviren (Ankaralı, 2008).

Statistical Analysis

SPSS 21.0 program was used in the analysis of the data. Descriptive statistical methods such as mean, standard deviation, median, minimum, and maximum values were used while evaluating the data in the study. In addition, Alpha Coefficient (Cronbach Alfa) was used to test the reliability of the Occupational Performance Questionnaire. The data

obtained from 51 children were used in the analysis. In addition, in order to determine to what extent, the questions affect alpha coefficient and in what direction; "If the variable is deleted, the Alpha coefficient of the scale" value is calculated. These values indicate the internal consistency of the remaining variables if any variables are deleted. Alpha if Item Deleted represents the scale's Cronbach's alpha reliability coefficient for internal consistency if the individual item is removed from the scale.

The construct validity of the questionnaire was tested by correlation method. Spearman correlation coefficient was used since the variables did not show normal distribution. In this context, correlation analysis was performed between the sub-sections of the Occupational Performance Questionnaire-Activity Performance Areas section and Sensory Profile. At the same time, correlation analysis was performed between the Occupational Performance Questionnaire-Effect on Family Members section and the sub-sections of the Parent Stress Index-Short Form scale. In the analysis made, the evaluation of the Spearman Correlation coefficient, was accepted as the critical value of 0.05 for the significance of p values.

Translation and Adaptation Procedure

The procedure defined by Guillemain and his friends was followed for the translation and adaptation process. In accordance with this procedure, the following steps have been completed (Beatone et al., 2000). The Occupational Performance Questionnaire was translated into Turkish by a Physiotherapist and occupational therapist whose mother tongue is Turkish, fluent in English and familiar with the terminology of the related questionnaire. A synthesis questionnaire was created by comparing these two translations. This translation was translated into English, the original language of the questionnaire, by the physiotherapist and nurse, who are native English speakers and fluent in Turkish. The original form of the questionnaire and this back translation were compared by the translators and inconsistencies were corrected. In the survey obtained, after the interviews with the author of the scale, Kerry Wallace, some expression

changes were made. Thus, the questionnaire has been prepared for a pilot study. The pilot study was carried out with 7 parents with randomly selected children with ASD. In this context, the expressions in some articles have been changed because they have no equivalent in society or are expressed differently (For example, the translation of the question 2 has been translated as "Marital status of the mother: single- divorced- living with partner- married", but this question is adapted to Turkish society. "Marital status of the mother: divorced- married" Similar changes were made in the 7th, 8th, and 21st questions.). In some items, the expression was changed to make the sentence more understandable (For example, the translation of the question 18 was made as "How old was your child when he no longer needed to wear a nappy at night?" But for the sentence to be more understandable, "How old was your child when he stopped using diapers at night?" Similar changes were made in the 23rd, 8.7th, and 11.6th questions.). Some questions were not found explicit by the parents in the pilot study and an example was added to these questions (For example, in the 3.2 question, the translation was made as "Is the variety of food textures that your child eats limited?" But the sentence is "hard, soft, etc." because it is not understood by the parents sufficiently. Similar additions were made in questions 8.6, 3.2, 4.2.1, 4.5., 8.3., 9.1.1., 9.1.2.)

Ethical Approval

Before starting the study, ethical approval was obtained with the decision numbered 2018/675 of the Uskudar University Non-Interventional Research Ethics Committee. This study was conducted in accordance with the Helsinki Declaration revised in 2013 and informed consent was obtained from the parents of the children included in the study.

RESULTS

Demographic Profile

The study was completed with 51 children, 84.4% male and 15.6% female. The average age of the participating children is 5.06 (SD = 1.21). 31.37% of children stay at home with their caregivers, 17.34% attend a kindergarten for children with special needs, 50.98% attend a kindergarten for normally

developing children. In addition, the therapies that children receive in addition to sensory integration are speech and language therapy (10%), physiotherapy (20%), and applied behaviour analysis (40%). The socio-demographic characteristics of the participants are shown in Table 1.

Reliability

The internal consistency of the OPQ was determined by the Cronbach Alpha coefficient. Internal consistency results of all parts of OPQ and scale total are given in Table 2.

As a result of the reliability analysis of the scale, the Cronbach Alpha coefficient was found to be 0.93 and the reliability of the scale was found to be high. When the question sections that make up the sub-sections of the scale are analysed, it is determined that the alpha values of the "sleep, toilet, nutrition, individual interaction, peer interaction, communication, play levels, group play and parental stress" sections are very reliable and highly reliable values. On the other hand, "individual play" section Alpha value has been found to have low reliability value. In the first case of the "group interaction" section, Alpha value was found to be "0.63". When the questions of this section are examined, "Can your child's brothers make friends to play?" When the question is removed from the scale, it is determined that the Alpha value of the section takes the value of "0,85". The effects of group interaction section items on reliability are indicated in Table 3.

Then, the correlation analysis of this question with other questions in the department and the total score of the department was examined. As a result of this examination, no meaningful relationship was found and it was decided to exclude the item from the scale. Correlation values for this question are given in Table 4.

Validity

Testing the validity of the OPQ was provided by the correlation method performed with identical forms. In this context, correlation analysis of OPQ and Sensory Profile and Parental Stress Index-Short Form scales were performed. Findings related to this analysis are given in Table 5.

Table 1. Sociodemographic Characteristics

Descriptive Statistics		Number	Percent
Gender	Female	8	15.6
	Male	43	84.4
Educational Status	Does not attend school	16	31.37
	Kindergarten for special needs children	9	17.34
	Kindergarten for normally developing children	26	50.98
Therapies receiving	Speech and language therapy	9	17.06
	Physiotherapy	1	1.09
	Applied behaviour analysis	25	49.01
		Min.-Max.	Mean-SD
Age		3-6.91	5.06±1.21

Table 2. Occupational Performance Questionnaire internal consistency results

Occupational Performance Questionnaire (OPQ)		Cronbach α
Personal Management	Sleeping	0.85
	Toilet Training	0.77
	Feeding	0.67
Social Interaction	Individual	0.86
	Peer Interaction	0.84
	Group Interaction	0.85
	Communication	0.74
Play	Level of Play	0.70
	Individual	0.42
	Group	0.74
TOTAL OCCUPATIONAL PERFORMANCE AREAS SCORE		0.93
Parent Stress		0.86
TOTAL OPQ SCORE		0.939

Table 3. Effect of group interaction items on reliability

6. Group Interaction Questions	If Item Deleted: Mean	If Item Deleted: Varyans	Corrected Item Whole Correlation	If Item Deleted: Cronbach Alpha
6.1. Are you able to attend family gatherings with your child?	13.69	8.500	0.603	0.499
6.2. Are you able to take your child to birthday parties?	13.76	7.984	0.641	0.469
6.3. Are you able to take your child to eat at restaurants?	13.86	8.681	0.448	0.558
6.4. Are his/her siblings able to have friends to play?	13.80	10.001	0.005	0.850
6.5. Is the family able to sustain relationships with other families?	13.43	8.810	0.655	0.498

Table 4. Correlation values for the question derived from the scale

6. Group Interaction Questions	Extracted Item	p	r
6.1. Are you able to attend family gatherings with your child?		0.930	- 0.013
6.2. Are you able to take your child to birthday parties?		0.977	- 0.004
6.3. Are you able to take your child to eat at restaurants?	6.4. Are his/her siblings able to have friends to play?	0.436	- 0.111
6.5. Is the family able to sustain relationships with other families?		0.833	- 0.030
Total Group Interaction Score		0.038*	- 0.291

Table 5. Correlation analysis of Occupational Performance Questionnaire and Sensory Profile and Parental Stress Index-Short Form (n = 51)

Occupational Performance Questionnaire Correlation			
Occupational Performance Questionnaire		p	r
A. Personal Management		0.04*	0.399
Sleeping		0.141	0.209
Toilet Training		0.010*	0.358
Feeding		0.035*	0.296
B. Social Interaction		<0.001**	0.521
Individual		<0.001**	0.550
Peer Interaction	Sensory Profile	0.125	0.217
Group Interaction		0.079	0.219
Communication		0.038*	0.291
C. Play		0.009*	0.361
Level of Play		0.02*	0.425
Individual		0.059	0.266
Group		0.133	0.213
Total Occupational Performance		<0.001**	0.557
	Parental Distress	<0.001**	-0.706
	Parent-Child	<0.001**	-0.499
	Difficult Child	<0.001**	-0.602
	Total Stress Score	<0.001**	-0.696
D. Impact on Individual Family Members			

p ≤0.05 * Significant
 p≤0.01 ** High rate significant
 Rho(r); 0.5-0.8, High correlation
 0.3-0.5, Medium correlation
 0.1-0.3, Weak correlation

There was a significant relationship between Sensory Profile and OPQ’s total score and main sections. There was a high-level correlation between “Sensory Profile” and “Total Occupational Performance” scores and “social interaction” scores, and a medium level correlation between “personal management” and “play” scores. While there was no correlation with the sections of “sleep, peer interaction, group interaction, individual play and group play”, which are the main parts of the question sections, correlations were found with the sections of “toilet, nutrition, communication, individual interaction, play levels”. A negative high-level correlation was found between the “individual effect on family members” section of the OPQ and the ESI-Short Form total score and all of its sub-parameters.

DISCUSSION

In this study, it was aimed to examine the validity and reliability of the Turkish version of the Occupational Performance Questionnaire (OPQ) in individuals aged 3-6 with autism spectrum disorder. According to the results of the study, the Occupational Performance Questionnaire is valid and reliable for Turkish children aged 3-6 years diagnosed with

autism spectrum disorder. In the analysis conducted to determine the internal consistency, Cronbach Alpha value was found to indicate a high degree of reliability (0.939) (Table 1). The Cronbach Alpha value (0,93) of the Occupational Performance Areas Total score, which is one of the parts of OPQ, was published in the article published by Wallace et al. to improve the original form of the scale, the same section was higher than the Cronbach Alpha value (0.72) supports reliability (Wallace et al., 2016). In addition, while the sections of the OPQ and the sub-sections of these sections were acceptable for internal consistency, the acceptable Alpha level for the "Individual Play" section, which is one of the "Play" section sub-sections, was not achieved (Table 4). Therefore, the items in this section need to be re-examined to increase the internal validity of OPQ. When the study of Wallace and his friends while developing the original of the scale is examined; an Acceptable Alpha level for internal consistency was not achieved in all of the sub-sections of “Social Interaction” section, “Group Interaction” and “Communication” sections and “Play” section and all sub sections of this section. This situation showed that the internal consistency of our study was higher

than the original scale development study. When the Cronbach Alpha values were deleted for each item in the OPQ (Table 3), an item that reduces the internal consistency in the sub-section and causes the Alpha value to increase in the section when it is deleted (0, 0.63, Increased to 85). The total score of this item and the correlation value between the questions in the department were examined (Table 2) and no significant relationship was obtained ($p \geq 0.05$). As a result of these analyses, it was decided to exclude the item from the scale.

In correlation analysis with identical forms to determine the construct validity of the scale, significant correlations were found between the total scores of each major part of the OPQ and the total score of the questionnaire and the identical forms used (Table 1) ($p \leq 0.05$). This situation showed that the validity of the scale is appropriate. The correlation values determined for the scale translated into Turkish were stronger than the correlation analysis values applied by Wallace et al. to determine the validity of the scale (Wallace et al., 2016).

Activity Performance, Sensory Profile, and Parental Stress Scores

Normally developing preschool children in the age group of three to six (Bayley, 1993; Case-Smith & Bryan, 1999) are generally among the activity performance areas described in the OPQ: "personal management", "social interaction", "play" and "communication". achieves developmental goals. Therefore, the expectation is that children in these age groups who develop normally will achieve maximum scores on all items in the OPQ. The general information section of the OPQ showed that only 9.8% to 66.6% of the participants with ASD were successful in the activity performance areas where children with normal development were expected to achieve 100%. This result supports the study by Jasmin et al. (Jasmin et al., 2009) that showed that children with ASD have significant deficiencies in daily living skills compared to their normally developing peers.

In the study, the fact that the evaluated sensory processing level scores of the participants were below the standard raw scores in many areas

supports the literature reporting the symptoms of sensory processing deficiency in ASD and the diagnostic criteria of ASD determined by the American Psychiatric Association (Baranek et al., 2007; Kern et al., 2007).

When the stress levels of the parents participating in this study were evaluated, it was seen that the results were high ($X=97.7$). Scores higher than 90 for the ES-Short Form are considered clinically significant (Abidin, 1983). Other studies using the ESİ-Short Form in studies conducted with parents of children with ASD also reported that parents of children diagnosed with ASD have high levels of parenting stress (Fisman et al., 2000).

The Relationship Between Activity Performance and Sensory Processing

In children with ASD, inappropriate sensory reactivity is strongly associated with being able to display adaptive responses. In the study by Dawson and Watling, sensory sensitivities and motor difficulties affect almost all dimensions of daily living skills (Dawson & Watling, 2000). In another study, sensory processing disorder in preschool children with ASD was compared with the activity performance in the areas of "Personal management", "Social interaction", "Communication" and "Play" and it was concluded that the impairment in sensory processing was strongly related to the failure in the activity performance areas. (Ben-Sasson et al., 2009). Consistent with the aforementioned literature, in this study, significant relationships were found between activity performance domains and sensory processing ($p \leq 0.05$).

The Relationship Between the Personal Management Section and the Sensory Profile Subsections

In this study, a significant relationship was found between the personal management section of the OPQ and all the main sections of the sensory profile questionnaire. Activity performance in the areas of sleep, toilet and nutrition, which are the sub-sections of personal management; The relationship between sensory processing, behavioural and sensory responses, and modulation subsections of the

sensory profile scale was also examined.

In the study conducted by Goldman et al., a significant relationship was found between sleep and sensory processing disorders (Goldman et al., 2009). Our study supports this study in some points, but since the relationship between all sub-scores of the sensory profile and sleep was examined in our study, the significance of the relationships changed according to the sub-sections. In our study, a significant relationship was found between sleep and "modulation", one of the main parts of the sensory profile, but no significant relationship was found between "sensory processing" and "behavioural and emotional responses". While there was a significant relationship between sleep and sensitivity between the sensory profile subsections, no significant relationship was found with the other sections.

Studies have shown that in children diagnosed with ASD; It is stated that the acquisition of toilet skills is delayed (Kircaali-İftar, 2007). In our study, when the toilet section scores of the OPQ were examined, the score required for maximum performance was 20, while the average score of the participants was below this figure ($x=12.2$), which supports the literature on acquiring toilet skills. In addition, significant relationships were found between the ability to acquire toilet skills and all the main parts of the sensory profile in our study. Again, with the ability to acquire toilet skills, from the subsections of the Sensory profile; Significant correlations were found with multi-sensory processing, oral sensory processing, recording, research, and sensitivity, with vestibular processing and sensory input seeking highly significant.

Cermak, Curtin and Bandini found in their study that sensory sensitivities cause high food selectivity. In our study, however, a significant relationship was found between nutrition and sensory processing, which is one of the main sections of the sensory profile, and no significant relationship was found with other sections. With nutrition; A significant relationship was found between oral sensory processing, which is one of the sub-sections of the sensory profile, but no significant relationship was found with the other sections. These findings support the studies of Cermak, Curtin, and Bandini (Cermak, Curtin, & Bandini, 2010).

The Relationship Between the Social Interaction Section and the Sensory Profile Subsections

In a study by Hilton et al. using the Sensory Profile (Dunn, 1999), low scores in multi-sensory processing, oral sensory processing, and touch processing were associated with reduced levels of social interaction (C. Hilton, Graver, & LaVesser, 2007; C. L. Hilton et al. al., 2010). In our study, similar to the study of Hilton et al., significant relationships were found between the main parts of the Sensory Profile and social interaction. If we examine the meaningful relationships found by categorizing the social interaction areas better:

Significant correlations were found with individual interaction and all of the main parts of the sensory profile. Between individual interaction and subsections of sensory profile, hearing process, vestibular processing, touch processing, oral sensory processing, movement and body position, emotional and social responses, sensory input seeking, emotional response, inattention/distraction, sensory sensitivity, research sensitivity, avoidance. quite significant; Significant results were found between visual processing, multi-sensory processing, emotional responses, behavioural results of sensory processing, perceptual fine motor, research. No significant results were found with the other subdivisions.

No significant relationship was found between peer interaction and the main parts of the sensory profile. Significant relationships were found between peer interaction and sensory profile sub-sections with touch processing and sensory input seeking sections. No significant relationship was found between group interaction and the main parts of the sensory profile, but being quite significant with the response threshold from the sub-sections of the sensory profile; Significant relationships were found between visual processing, multi-sensory processing, and weak recording.

A significant relationship was found between communication and sensory processing, one of the main sections of the sensory profile, but no significant relationship was found with other sections. Significant relationships were found between communication and sensory profile sub-

sections, vestibular processing, tactile processing, and sensitivity.

The Relationship Between the Play Section and the Sensory Profile Subsections

Schaaf et al. stated that sensory processing difficulties affect participation in play activities and other activities of daily living (Schaaf, 2015). Ayres says that sensory processing disorders seen in children; stated that it has an effect on the child's ability to participate in school and at home, and to play games with family and peers (A Jean Ayres, 1972b). In this study, the play activities mentioned were analysed by dividing into sections, and sensory processing disorders were determined according to the main sections of the sensory profile. The relationship between these two determinations has been revealed. Significant relationships were found between the play and other main parts, except for behavioural and emotional responses. This finding supports the literature.

Significant relationships were found with modulation and behavioural and emotional responses, with play levels being quite significant with sensory processing, one of the main parts of the sensory profile. Significant relationships were found between play levels and the sub-sections of the sensory profile, tactile processing, seeking sensory input, emotional response, sensitivity, and movement and body position, emotional and social responses, seeking and avoidance.

While there were significant relationships between individual play and sensory processing and modulation, which are the main sections of the sensory profile, no significant relationship was found with the behavioural and emotional responses section. A significant relationship was found with the individual play and the visual inputs affecting the emotional response and activity level, with sensitivity and sensitivity, which are the sub-sections of the sensory profile, quite significant.

No significant relationship was found between group play and the main parts of the sensory profile. A very significant relationship was found between group play and touch operation, which is one of the sensory profile sub-sections.

CONCLUSION

In conclusion, it was determined that the OPQ was valid and reliable, and it was suitable for evaluating the Occupational Performance of Turkish children aged 3-6 years diagnosed with ASD. In this study, the recommendation of increasing the sample size obtained in the study of Wallace and colleagues while developing the original of the scale was followed in future studies. In the version study of the scale translated into Turkish (n = 51), increasing the sample size was associated with higher validity and reliability values compared to the study conducted by Wallace et al. (N = 19) to develop the original version of the scale. Although the results indicate that OPQ shows good psychometric properties, limitation of the study is that part 3 of the scale could not be included in the study, we believe that it will be beneficial to apply the validity and reliability study in part 3 by applying adequate therapy process in future studies.

Acknowledgment

The authors of this article would like to thank all participants who participated in the study.

Conflict of Interest

The authors declare that there is no conflict of interest.

Research Funding

Authors did not receive grant from any funding agency for the study.

REFERENCES

- Abidin, R. R. (1983). Parenting Stress Index: Manual, Administration Booklet, [and] Research Update. Action Plan 2016-2019. (2016) <http://www.resmigazete.gov.tr/eskiler/2016/12/20161203-16.htm> Date of access: 15.12.2019
- Allik, H., Larsson, J.O. & Smedje, H. 2006, Health related quality of life in parents of school-age children with Asperger syndrome or high functioning autism, Health Quality of Life Outcomes, vol 44, no 1, pp 1-5.
- Ankaralı, E. M. O. H. H. (2008). Turkish version of the parenting stress index short form: a psychometric study. *Turkiye Klinikleri Journal of Medical Sciences*, 28(3), 291-296.
- A. P. A. (2013). Diagnostic and statistical manual of mental disorders (DSM-5®): American Psychiatric Pub.
- Ayres, A. J. (1972b). Types of sensory integrative dysfunction among disabled learners. *American*

- Journal of Occupational Therapy.
- Baranek, G. T., David, F. J., Poe, M. D., Stone, W. L., & Watson, L. R. (2006). Sensory Experiences Questionnaire: discriminating sensory features in young children with autism, developmental delays, and typical development. *Journal of Child Psychology and Psychiatry*, 47(6), 591-601.
- Bayley, N. (1993). Bayley scales of infant development: Manual: Psychological Corporation.
- Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine*, 25(24), 3186-3191.
- Case-Smith, J., & Bryan, T. (1999). The effects of occupational therapy with sensory integration emphasis on preschool-age children with autism. *The American journal of occupational therapy*, 53(5), 489-497.
- Cermak, S. A., Curtin, C., & Bandini, L. G. (2010). Food selectivity and sensory sensitivity in children with autism spectrum disorders. *Journal of the American Dietetic Association*, 110(2), 238-246.
- Dawson, G., & Watling, R. (2000). Interventions to facilitate auditory, visual, and motor integration in autism: A review of the evidence. *Journal of autism and developmental disorders*, 30(5), 415-421.
- Dunn, W. (1999). Sensory profile (Vol. 555): Psychological Corporation San Antonio, TX.
- Fisman, S., Wolf, L., Ellison, D., & Freeman, T. (2000). A longitudinal study of siblings of children with chronic disabilities. *The Canadian Journal of Psychiatry*, 45(4), 369-375.
- Fombonne, E. 2003, The prevalence of autism, *Journal of the American Medical Association*, vol. 289, no. 1, pp 87-89.
- Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines. *Journal of clinical epidemiology*. 1993;46(12):1417-32
- Goldman, S. E., Surdyka, K., Cuevas, R., Adkins, K., Wang, L., & Malow, B. A. (2009). Defining the sleep phenotype in children with autism. *Developmental neuropsychology*, 34(5), 560-573.
- Hilton, C., Graver, K., & LaVesser, P. (2007). Relationship between social competence and sensory processing in children with high functioning autism spectrum disorders. *Research in Autism Spectrum Disorders*, 1(2), 164-173.
- Hilton, C. L., Harper, J. D., Kueker, R. H., Lang, A. R., Abbacchi, A. M., Todorov, A., & LaVesser, P. D. (2010). Sensory responsiveness as a predictor of social severity in children with high functioning autism spectrum disorders. *Journal of autism and developmental disorders*, 40(8), 937-945.
- Jacklin L. The changing profile of autism in a clinic for children with developmental delay. *Pandagram*, 2006; 11(1): 2-3.
- Jasmin, E., Couture, M., McKinley, P., Reid, G., Fombonne, E., & Gisell, E. (2009). Sensori-motor and daily living skills of preschool children with autism spectrum disorders. *Journal of autism and developmental disorders*, 39(2), 231-241.
- Jasmin, E., Couture, M., McKinley, P., Reid, G., Fombonne, E., & Gisell, E. (2009). Sensori-motor and daily living skills of preschool children with autism spectrum disorders. *Journal of autism and developmental disorders*, 39(2), 231-241.
- Kayihan, H., Akel, B. S., Salar, S., Huri, M., Karahan, S., Turker, D., & Korkem, D. (2015). Development of a Turkish version of the sensory profile: translation, cross-cultural adaptation, and psychometric validation. *Perceptual and motor skills*, 120(3), 971-986.
- Kern, J. K., Trivedi, M. H., Grannemann, B. D., Garver, C. R., Johnson, D. G., Andrews, A. A., Schroeder, J. L. (2007). Sensory correlations in autism. *Autism*, 11(2), 123-134.
- Kırcaali-İftar, G. (2007). Otizm spektrum bozukluğu. İstanbul: Daktylos Yayınları.
- Kientz, M. A., & Dunn, W. (1997). A comparison of the performance of children with and without autism on the Sensory Profile. *The American Journal of Occupational Therapy*, 51(7), 530-537.
- Law, M., Polatajko, H., Pollock, N., Mccoll, M. A., Carswell, A., & Baptiste, S. (1994). Pilot testing of the Canadian Occupational Performance Measure: clinical and measurement issues. *Canadian Journal of Occupational Therapy*, 61(4), 191-197.
- Maenner MJ, Shaw KA, Baio J, et al. Prevalence of Autism Spectrum Disorder Among Children Aged 8 Years — Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2016. *MMWR Surveill Summ* 2020;69(No. SS-4):1–12. DOI: <http://dx.doi.org/10.15585/mmwr.ss6904a1external> icon.
- Miller-Kuhaneck H. Autism: A Comprehensive Occupational Therapy Approach. Baltimore: AOTA Press, 2004.
- Rakap, S., Birkan, B., & Kalkan, S. (2017). Türkiye'de otizm spektrum bozukluğu ve özel eğitim: Tohum Otizm Vakfı.
- Schaaf, R. C. (2015). Clinician's guide for implementing Ayres Sensory Integration: promoting participation for children with autism, 3-32.
- The Ministry Of Health. A Guide To Healthy Eating recommendations for individuals with autism spectrum disorder. (2018) Date of access: 15.12.2019
- The Ministry Of Education. National For Individuals With Autism Spectrum Disorder
- The Ministry Of Education. Special Education Services Regulation https://orgm.meb.gov.tr/meb_iys_dosyalar/2012_10/10111226_ozel_egitim_hizmetleri_yonetmeligi_son. Date of accessed 20.02.2018
- Yiğit, N., Bütüner, S.Ö., Dertlioğlu, K. (2008). Öğretim amaçlı örütbağ sitesi değerlendirme ölçeği geliştirme. *Necatibey Eğitim Fakültesi Elektronik Fen ve Matematik Eğitimi Dergisi*, 2 (2).
- Wallace, K., Franzsen, D., & Potterton, J. (2016).

Development of an Occupational Performance Questionnaire for preschool children with Autistic Spectrum Disorder. *South African Journal of Occupational Therapy*, 46(2), 23-30.

Watling, R. L., & Dietz, J. (2007). Immediate effect of Ayres's sensory integration-based occupational therapy intervention on children with autism spectrum disorders. *The American journal of occupational therapy*, 61(5), 574.