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ORIGINAL RESEARCH

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THE INTERRATER RELIABILITY OF NURSING OUTCOME CLASSIFICATION (NOC): “SELF-CARE: EATING” ON MENTALLY DISABLED CHILDREN IN YOGYAKARTA

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Abstract

Background: The common problems suffered by children with intellectual disability are difficulty to perform of daily activities or self-care including eating activity. NOC Self-care: eating is a measurement of client's status regarding eating skill after provides nursing intervention. NOC was translated into Indonesian and its indicators were operationalized. The measurement of self-care: eating need to be evaluated, thus the reliability of this instrument was tested to determine whether the NOC is also reliable for use in Indonesia.

Objective: The aim of this study was to investigate the interrater reliability of the NOC: Self-care: eating in the Indonesian Language in children with intellectual disability.

Methods: Two raters assessed 124 children with intellectual disability using NOC: Self-care: eating. The study was conducted on December 2017 to January 2018. NOC was translated into Indonesian and each indicator was operated. Kappa and percent agreement were used for the analysis.

Results: The overall kappa value of NOC: Self-care: eating was 0.55, while the percent agreement was 88. The highest kappa value and percent agreement was indicator of swallowing the food (0.8 and 99).

Conclusions: The interrater reliability of NOC: Self-care: eating in Indonesian was at the level of great reliability.

Keywords: NOC; self-care: eating; interrater reliability; children with intellectual disability

INTRODUCTION

Outcome in the classification are for use at individual or patient, family, and community level. The term of patient is used in the classification to indicate an individual who is the recipient of nursing care. The first NOC publication was issued in 1997 contained 190 outcomes. The second edition included 260 outcomes in 2000 and third edition contained 330 outcomes in 2004. The fourth edition was

issued from 2008 with 385 outcomes ([Moorhead et al., 2008](#)). The fifth edition consist of 490 outcomes has been translated to Indonesian.

The language used in the outcome describes the language used by nurses in the nursing literature and practice. Language used most consistently by nurse, rather than by those in

other disciplines, was selected for the outcomes whenever possible. Nevertheless, each country need the language and terms especially the language.

NOC Self-Care: eating is defined as ability to prepare and ingest food and fluid independently with or without assistive device ([Moorhead et al., 2008](#)). NOC Self-Care: eating” is one of the NOC of Nursing diagnose (ND): feeding self-care deficit. ND: feeding self-care deficit is impaired ability to perform or complete self-feeding activity ([Herdman & Kamitsuru, 2014](#)). The NOC of ND: feeding self-care deficit are nutritional status, nutritional status: food and fluid intake, self-care: activities of daily living (ADL), self-care: eating, swallowing status ([Johnson et al., 2006](#)). NOC Self-Care: Activities of daily living (ADL) defined as the ability to perform the most basic physical task and personal care activity ([Moorhead et al., 2008](#)). There are 10 indicators from NOC Self-Care: Activities of daily living (ADL) such as ambulation: walking, transfer performance, ambulation: wheelchairs, toileting, bathing, hygiene, oral hygiene, eating, and dressing, and grooming

The NOC checklist should valid and reliable before use to measure outcome of intervention. Validity is an important key to effective research and a requirement for both quantitative and qualitative research. Reliability is essentially a synonym for consistency and replicability over time, over instruments and over groups of respondents. It is concerned with precision and accuracy. As an instrument, NOC checklist should be valid and reliable. One of measuring of reliability of NOC checklist is to use interrater reliability. The reliability of this assessment process can be established by asking two individuals referred to as raters, to independently perform this assessment with the same set of objects ([Gwet, 2014](#)).

This recent study was conducted on Mentally Disability Children in Special School in Yogyakarta Indonesia. The reason why we conducted to children with mentally disability

was because this group of children has the highest number of kinds of disability.

The measurement of NOC self-care: eating needs to be evaluated. Self-Care: eating is defined as ability to prepare and ingest food and fluid independently with or without assistive device ([Moorhead et al., 2008](#)). The NOC Self-Care: eating was then translated into Indonesian and its indicators were operationalized. The reliability of this instrument does not have been reported in Indonesian population. Therefore, it is needed test of this instrument to determine whether the NOC is reliable for use in Indonesia. The aim of this study was to investigate the interrater reliability of the NOC “Self-Care: eating” in the Indonesian language in children with mentally disability.

METHODS

Study design

This study used the cross-sectional design to measure the reliability of NOC Self-care: eating. The public special school of Bantul District was chosen as the study site.

Setting

This study was conducted from December 2017 to January 2018, involving 124 of children with mentally disability aged 6-12 years. The inclusion criteria specified children who attended in public special school of Bantul District and who had no others disabilities. This study recruited raters a month before to data collection. Two raters were assigned to measure the NOC. They were students from the Nursing Program, who had completed the pediatric nursing subject. Both of raters were given training prior in 4 hours. The aim of this training was to make both of the raters know and understand the method of measuring the rating scale in NOC indicators. Two raters observed children who had eating.

Sample

The reliability measurement was performed in 124 children with mentally disability who study in special school of Bantul District area.

The inclusion criteria specified children who attended in public special school of Bantul District and who had no others disabilities.

Instrument

The NOC Self-care: eating was design by (Moorhead et al., 2008). In this present study, the NOC Self-care: eating was translated into the Indonesian Language. Each indicator/ item gives the operational definition and was observed on five-point score: score 1 if the item was severely compromised, 2 if the item was substantially compromised, 3 if the item was moderately compromised, 4 if the item was mildly compromised, and 5 if the item

was not compromised. Each score in the all of item of NOC Self-care: eating was developed by rubric (**Table 1**). A higher score indicated greater of self-care: eating. We recruited raters a month before to data collection. Two raters were assigned to measure the NOC. They were students form the nursing program, who had completed the pediatric nursing subject. Both of raters were given training prior in 4 hours. The aim of this training was to make both of the raters know and understand the method of measuring the rating scale in NOC indicators. Children who had eating were observed by two raters.

Table 1 Criteria for measuring reliability of NOC Self-care: eating

Code	Indicator	Operational Definition	Literature/s	Rubric
030301	Prepares food for ingestion	The activity to prepare food with utensil	(Kaur & Kumar, 2013)	<ol style="list-style-type: none"> 1. Ability or inability to take a plate/spoon/cup or glass although had been guided more than two (2) times. 2. Ability to take a plate/spoon/cup/glass with guide of two (2) times. 3. Ability to take a plate/spoon/cup or glass with guide one (1) time. 4. Ability to take at least one of them (plat/spoon/cup/glass) 5. Ability to take a plate, spoon and cup/glass.
030302	Open Containers	The activity to open the cover of food	(Kaur & Kumar, 2013)	<ol style="list-style-type: none"> 1. Ability or inability to open food cover although had been guided more than two (2) times. 2. Ability to open the food cover incompletely with guided one (1) time. 3. Ability to open food cover with guide one (1) time 4. Ability to open food cover incompletely without guide. 5. Open food cover independently.
030304	Puts food into utensil	The activity to put food with spoon or fork	(Ivy, 2014; Kaur & Kumar, 2013)	<ol style="list-style-type: none"> 1. Ability to put food on spoon or fork with guided more than two (2) time. 2. Ability to put food on spoon or fork with guided two (2) times. 3. Ability to put food on spoon or fork with guided one (1) time 4. Ability to put food on spoon or fork independently 6. Ability to put food on spoon or fork independently and nothing is scattered.
030316	Cuts up food	The activity to prepare food with take it with spoon or divide food into small part thus entry to mouth easier.	(Ivy, 2014; Kaur & Kumar, 2013)	<ol style="list-style-type: none"> 1. Ability or inability to cut or take with spoon with guide > 2 times. 2. Ability to cut or take with spoon with guided two (2) times 3. Ability to cut or take with spoon with guided one (1) times 4. Ability to cut or take with spoon incompletely by themselves. 5. Ability to cut or take with spoon independently and nothing scattered
030303	Uses utensils	The activity to eat with spoon correctly	(Kaur & Kumar, 2013)	<ol style="list-style-type: none"> 1. Ability or inability to hold spoon correctly with guided more than two (2) times. 2. Ability to hold spoon correctly with guide two (2) times. 3. Ability to hold spoon correctly with guided one (1) time. 4. Ability to hold spoon correctly without guided. 5. Ability to hold spoon correctly and independently.

030306	Brings food to mouth with fingers	The activity to bring food into mouth with fingers	(Kaur & Kumar, 2013)	<ol style="list-style-type: none"> 1. Ability or inability to bring food to mouth with fingers with guided more than two (2) times. 2. Ability to bring food to mouth with fingers with guided two (2) times. 3. Ability to bring food into mouth with fingers with guided one (1) time. 4. Ability to bring food to mouth with finger independently but incompletely (scattered). 5. Ability to bring food to mouth with finger independently and completely.
030307	Brings food to mouth with container	The activity to bring food to mouth by spoon	(Ivy, 2014; Kaur & Kumar, 2013)	<ol style="list-style-type: none"> 1. Ability or inability to bring food into mouth by spoon with guided more than two (2) times. 2. Ability to bring food into mouth by spoon two (2) times. 3. Ability to bring food into mouth by spoon with guided one (1) time. 4. Ability to bring food into mouth by spoon independently but incompletely (scattered). 5. Ability to bring food into mouth by spoon independently and completely.
030308	Brings food to mouth with utensil	The activity to bring food to mouth by fork	(Kaur & Kumar, 2013)	<ol style="list-style-type: none"> 1. Ability or inability to bring food into mouth by fork with guided more than two (2) times. 2. Ability to bring food into mouth by fork with guided two (2) times. 3. Ability to bring food into mouth by fork with guided one (1) time. 4. Ability to bring food into mouth by fork independently but incompletely (scattered). 5. Ability to bring food into mouth by fork independently and completely.
030312	Chews food	The activity to sublimite the food in the mouth	(Kaur & Kumar, 2013)	<ol style="list-style-type: none"> 1. Inability to chew the food (0 to 5-time chews) or ability with guided as much as twice. 2. Ability to chew the food with guided as much once. 3. Ability to chew the food completely with guided as much as once 4. Ability to chew the food independently 5. Ability to chew the food independently and completely.
030313	Swallows food	The activity to swallow food	(Kaur & Kumar, 2013)	<ol style="list-style-type: none"> 1. Choking at least one-time during eating period. 2. Choking 1-2 times during eating period. 3. Ability to swallow food and need to mix with water 4. Ability to swallow independently with longer time without choking. 5. Swallow food completely without guided.
030305	Picks up cup or glass	The activity to drink with glass or cup	(Kaur & Kumar, 2013)	<ol style="list-style-type: none"> 1. Ability or inability to picks up cup or glass with guided more than two (2) times. 2. Ability to picks up cup or glass incompletely (scattered) with guided one (1) time. 3. Ability to picks up cup or glass completely with guided one (1) time. 4. Ability to picks up cup or glass independently but incompletely (scattered). 5. Ability to picks up cup or glass independently and completely.
030309	Drinks from a cup or glass	The activity to drink with cup or glass.	(Kaur & Kumar, 2013)	<ol style="list-style-type: none"> 1. Ability or inability to drink with cup or glass with guided more than two (2) times. 2. Ability to drink with cup or glass incompletely (scattered) with guided one (1) time. 3. Ability to drink with cup or glass completely with guided one (1) time. 4. Ability to drink with cup or glass independently but incompletely (scattered) 5. Ability to drink with cup or glass independently and completely.

030317	Swallows fluid	The activity to swallow fluid	(Kaur & Kumar, 2013)	<ol style="list-style-type: none"> 1. Ability or inability to swallow with guided more two (2) times. 2. Ability to swallow with guided two (2) times. 3. Ability to swallow independently with guided one (1) time. 4. Ability to swallow independently but dripping or choking. 6. Ability to swallow independently and completely.
030314	Complete a meal	The activity to finish with clean their self and surrounding them and not spilled.	(Kaur & Kumar, 2013) (Bailey & Angell, 2005)	<ol style="list-style-type: none"> 1. Ability or inability to finish and clean with guided more than two (2) times. 2. Ability to finish and clean with guided two (2) time. 3. Ability to finish or clean with guided one (1) time. 4. Ability to finish or clean independently but dripping 5. Ability to finish and clean independently.

Ethical consideration

Ethical approval was obtained from the Medical and Health Research Committee (MHREC) of the Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, number KE/FK/0016/EC/2017.

Data analysis

The data were analyzed using computer and tested using kappa and percent agreement. Kappa and percent agreement were to find out the interrater reliability of every NOC indicator and overall NOC indicators. Kappa scale were classified into "Poor" if the value was less than 0.20, "Fair" if the value was 0.21-0.40, "Moderate" if the value was 0.41-0.60, "Good" if the value was 0.60-0.80, and "Very good" if the value was 0.80-1.00 ([Marston, 2010](#)).

RESULTS

The results showed that there was indicator of the NOC "self-care: eating" had the "fair" category kappa value (chews food). There were seven (7) indicators in the NOC "self-care: eating" in moderate category and six (6) indicators in NOC "self-care: eating" in substantial category. Indicators of NOC "self-care: eating" in moderate category were cuts up food, bring food to mouth with finger, bring food to mouth with utensil, picks up a cup or glass, drink with a cup or glass, swallows fluid, complete a meal. Meanwhile, prepare food for ingestion, open containers, puts food into utensil, uses utensil, bring food to mouth with container, and swallow food were in substantial category (**Table 2**).

Table 2 Interrater Reliability of NOC "Self-Care: Eating"

No	Indicators	Kappa	Percent Agreement
1	Prepare food for ingestion	.616	78%
2	Open containers	.655	85%
3	Puts food into utensil	.639	80%
4	Cuts up food	.468	91%
5	Uses utensil	.649	95%
6	Bring food to mouth with finger	.547	89%
7	Bring food to mouth with container	.638	90%
8	Bring food to mouth with utensil	.412	79%
9	Chews food	.365	97%
10	Swallows food	.797	99%
11	Picks up a cup or glass	.487	85%
12	Drink with a cup or glass	.523	96%
13	Swallows fluid	.432	97%
14	Complete a meal	.451	77%
Total		.549	88%

Table 3 The final instrument in Indonesian Language

LEMBAR OBSERVASI PERAWATAN DIRI: MAKAN						
Nama inisial :		Tanggal :				
Usia :		Nama observer :				
Panduan pengisian: Lingkari pada angka sesuai dengan hasil pengamatan anda untuk setiap item.						
No	Items	1	2	3	4	5
		Sangat terganggu	Banyak terganggu	Cukup terganggu	Sedikit terganggu	Tidak terganggu
		1	2	3	4	5
1.	Menyiapkan makanan yang akan disantap	Mampu atau tidak mampu mengambil piring atau sendok atau gelas dengan diarahkan lebih dari dua kali.	Mampu mengambil piring atau sendok atau gelas, dengan arahan 2 kali	Mampu mengambil piring atau sendok atau gelas, dengan arahan 1 kali	Mampu mengambil minimal salah satu dari piring, sendok dan gelas.	Mampu mengambil piring, sendok dan gelas.
2.	Membuka tutup makanan	Mampu atau tidak mampu membuka penutup makanan dengan diarahkan lebih dari 2 kali	Mampu membuka penutup makanan secara tidak sempurna dengan arahan 1 kali	Mampu membuka penutup makanan secara sempurna dengan arahan 1 kali	Mampu membuka penutup makanan secara tidak sempurna tanpa arahan	Membuka penutup makanan secara sempurna dan mandiri
3.	Manaruh/meletakkan makanan pada alat makan	Mampu atau tidak mampu meletakkan makanan pada sendok atau garpu dengan arahan lebih dari 2 kali	Mampu meletakkan makanan pada sendok atau garpu dengan arahan 2 kali	Mampu meletakkan makanan pada sendok atau garpu dengan arahan 1 kali	Mampu meletakkan makanan pada sendok atau garpu secara mandiri	Mampu meletakkan makanan pada sendok atau garpu secara mandiri dan tidak ada yang tercecer.
4.	Memotong makanan	Mampu atau tidak mampu memotong/menendok makanan dengan arahan > 2 kali	Mampu memotong/menendok makanan dengan arahan 2 kali	Mampu memotong/menendok makanan dengan arahan 1 kali	Mampu memotong/menendok makanan dengan tidak sempurna secara mandiri	Mampu memotong/menendok makanan secara mandiri dan tidak ada yang terjatuh.
5.	Menggunakan alat makan	Mampu atau tidak mampu memegang sendok dengan benar dengan arahan > 2 kali	Mampu memegang sendok dengan benar dengan arahan 2 kali	Mampu memegang sendok dengan benar dengan arahan 1 kali	Mampu memegang sendok dengan benar tanpa arahan	Mampu memegang sendok dengan benar dan secara mandiri
6.	Memasukkan makanan ke mulut dengan jari	Mampu atau tidak mampu memasukkan makanan dengan jari dengan arahan > 2 kali	Mampu memasukkan makanan dengan jari dengan arahan 2 kali	Mampu memasukkan makanan dengan jari dengan arahan 1 kali	Mampu memasukkan makanan dengna jari secara mandiri namun ada makanan yang terjatuh	Mampu memasukkan makanan dengan sendok secara mandiri dan rapi.
7.	Memasukkan makanan ke mulut dengan sendok	Mampu atau tidak mampu memasukkan makanan ke mulut menggunakan sendok dengan arahan > 2 kali	Mampu memasukkan makanan ke mulut menggunakan sendok dengan arahan 2 kali	Mampu memasukkan makanan ke mulut menggunakan sendok dengan arahan 1 kali	Mampu memasukkan makanan menggunakan sendok secara mandiri namun ada makanan yang terjatuh	Mampu memasukkan makanan menggunakan sendok secara mandiri dan rapi.
8.	Memasukkan makanan ke	Mampu atau tidak mampu	Mampu memasukkan	Mampu memasukkan	Mampu memasukkan	Mampu memasukkan

	mulut dengan peralatan makan	memasukan makanan ke mulut menggunakan garpu dengan arahan > 2 kali	makanan ke mulut menggunakan garpu dengan arahan 2 kali	makanan ke mulut menggunakan garpu dengan arahan 1 kali	makanan ke mulut menggunakan garpu secara mandiri namun ada makanan yang terjatuh.	makanan ke mulut secara mandiri dan rapi.
		1	2	3	4	5
9.	Mengunyah makanan	Tidak mampu mengunyah makanan sama sekali (0-5 kali kunyahan) atau mampu dengan arahan 2 kali	Mampu mengunyah makanan namun mengalami kesulitan dengan arahan 1 kali	Mampu mengunyah makanan secara benar dengan arahan 1 kali	Mampu mengunyah makanan dengan sedikit kesulitan tanpa arahan	Mampu menelan makanan dengan sempurna dan tanpa tersedak.
10	Menelan makanan	Anak tersedak lebih dari 2 kali selama makan	Anak tersedak 1-2 kali selama makan	Anak mampu menelan makanan dengan bantuan minum air	Mampu menelan makanan secara mandiri tanpa tersedak walaupun membutuhkan waktu yang lama.	Mampu menelan makanan dengan sempurna tanpa tersedak.
11	Mengambil minuman dengan gelas/cangkir	Mampu atau tidak mampu menuangkan air ke dalam gelas dengan arahan > 2 kali	Mampu menuangkan minuman ke gelas dengan arahan 1 kali dalam kondisi berceceran.	Mampu menuangkan minuman ke gelas dengan benar dengan arahan 1 kali.	Mampu menuangkan minuman ke gelas tanpa arahan namun masih berceceran.	Mampu menuangkan minuman ke gelas secara mandiri dan rapi.
12	Minum dengan gelas/cangkir	Mampu atau tidak mampu minum menggunakan gelas dengan arahan > 2 kali	Mampu minum menggunakan gelas dengan arahan 1 kali namun berceceran.	Mampu minum menggunakan gelas dengan arahan 1 kali tanpa berceceran.	Mampu minum menggunakan gelas tanpa arahan namun berceceran.	Mampu minum menggunakan gelas secara mandiri dan rapi.
13	Menelan minuman	Mampu atau tidak mampu menelan minuman dengan arahan > 2 kali	Mampu menelan minuman dengan arahan 2 kali	Mampu menelan minuman dengan arahan 1 kali	Mampu menelan minuman tapi tumpah atau tersedak.	Mampu menelan minuman tanpa tumpah dan tersedak.
14	Menyelesaikan makanan	Mampu atau tidak mampu menyelesaikan dan membersihkan makanan dengan arahan > 2 kali.	Mampu atau tidak mampu menyelesaikan dan membersihkan makanan dengan arahan 2 kali	Mampu menyelesaikan dan membersihkan makanan dengan arahan 1 kali	Mampu menyelesaikan dan membersihkan makanan tanpa arahan namun masih belum rapi	Mampu menyelesaikan dan membersihkan makanan tanpa arahan dan rapi.

DISCUSSION

NOC "Self-Care: eating" is one of the NOC of Nursing diagnose (ND) "feeding self-care deficit. ND: feeding self-care deficit is impaired ability to perform or complete self-feeding activity ([Herdman & Kamitsuru, 2014](#)). The NOC of ND: feeding self-care deficit are nutritional status, nutritional status: food and fluid intake, self-care: activities of daily living (ADL), self-care: eating, swallowing status ([Johnson et al., 2006](#)). NOC Self-Care: Activities of daily living (ADL) defined as the ability to perform the most basic

physical task and personal care activity ([Moorhead et al., 2008](#)). There are 10 indicators from NOC Self-Care: Activities of daily living (ADL) such as ambulation: walking, transfer performance, ambulation: wheelchairs, toileting, bathing, hygiene, oral hygiene, eating, and dressing, and grooming.

This finding is the first study regarding interrater of NOC self-care: eating in Indonesian version (See **Table 3**). The kappa coefficient in this present study was 0.54 (moderate category). [Seganfredo and Almeida \(2011\)](#) reported that NOC "self-care: activities

of daily living (ADL) was validated by experts. Previous study regarding eating as indicator of NOC self-care: activities of daily living (ADL) have moderate kappa coefficient (0.54) ([Almeida et al., 2010](#)).

Table 2 shows that a percent agreement of NOC Self-care: eating was 88%. The minimum acceptable limit for interrater reliability agreement was 0.61 ([Marston, 2010](#)). This finding indicates that the percent agreement, in which moderate kappa value and high percent agreement value. This finding is similar with previous study that reported the kappa coefficient of “NOC: Pain Control” in Spanish version was 0.48 ([Bellido-Vallejo & Pancorbo-Hidalgo, 2017](#)). This result regarding the percent agreement is consistent with previous study that reported the percent agreement of NOC “caregiver Performance: Direct care” in which the resulting percent agreement was high (0.80 or 80%) ([Adistya et al., 2016](#)). This finding showed NOC self-care: feeding in Indonesian Version has moderate kappa coefficient and high percent agreement. These indicate that NOC self-care: eating in Indonesian Version could be suitable to use as indicators of NOC self-care: feeding in mentally disabled children. It consistent to study conducted by [Schneider et al. \(2008\)](#) which reported that NOC was responsive to patient status change in the outcome categories including activities of daily living, cardiopulmonary status, coping, and illness management behavior. Even [Head et al. \(2004\)](#) reported there were six community-level outcomes have the greatest of content validity (community health: immunity, community risk control: communicable disease, community health status, community risk control: chronic disease, and community competence).

CONCLUSION

NOC Self-Care: eating has moderate (enough) Kappa value, so it could be used for measuring eating skill in Indonesian Mentally Disabled Children aged 6-12 years.

Declaration of Conflicting Interest

None declared.

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Author Contribution

All authors contributed equally in this study.

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