

University of Groningen

Lifestyle Opportunities

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DOI:
[10.33612/diss.206455014](https://doi.org/10.33612/diss.206455014)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2022

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):
Overwijk, A. (2022). *Lifestyle Opportunities: supporting a healthy lifestyle of people with moderate to profound intellectual disabilities*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen. <https://doi.org/10.33612/diss.206455014>

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Chapter 4

A questionnaire to measure direct support professionals' attitude towards healthy nutrition of people with intellectual disabilities

Abstract

Background: Direct support professionals'(DSPs) attitudes toward nutrition are important for supporting a healthy lifestyle of persons with intellectual disabilities. However, there are no instruments to measure it. The aim of this study was to compose a questionnaire and determine its internal validity.

Method: The previously validated Health Enhancing Physical Activity questionnaire was adapted into the Attitude of DSPs for Health Enhancing Nutrition (ADSP-HENU) and completed by 31 DSPs. The internal validity of the questionnaire was investigated by Cronbach's Alpha and an exploratory non-parametric item response analysis (NIRT).

Results: The internal consistency by Cronbach's Alpha was good (0.87, 95% CI [0.81-0.94]). NIRT showed monotonicity with wide confidence bounds and sufficient point polyserial correlations of the items. This indicates that each attributes to the overall measured attitude.

Conclusion: The internal validity of the ADSP-HENU is promising, and it can be used in daily practice for evaluation or adapting interventions to DSPs' needs.

Overwijk, A., Krijnen, W.P., Hilgenkamp, T.I.M., Van der Schans, C.P., Van der Putten, A.A.J., & Waninge, A. A questionnaire to measure direct support professionals' attitude towards healthy nutrition of people with intellectual disabilities. *Manuscript under review.*

Background

Individuals with moderate to profound intellectual disabilities who live in residential facilities are highly dependent on their direct support professionals (DSPs) for a healthy lifestyle¹. Since healthy nutrition and adequate physical activity levels are more challenging for people with moderate, severe, and profound intellectual disabilities compared to the general population^{2,3}, it appears that the support of DSPs in these areas requires extra attention. Previous research shows, for example, that they are not sufficiently equipped to support a healthy lifestyle and require additional knowledge and skills⁴⁻⁷. In addition to these, a positive attitude is needed to implement healthy lifestyle support^{8,9}.

Attitude can be defined as the thoughts and feelings of DSPs regarding a healthy lifestyle¹⁰. According to the Theory of Planned Behavior¹¹, attitude is one of the aspects that determines intentions that subsequently influence the behavior of DSPs regarding healthy lifestyle support¹². Additionally, the attitude and behavior of DSPs can be influenced by the domains of the Theoretical Domains Framework (TDF)^{13,14}. The TDF is a widely used evidence based theoretical framework that provides insights into the domains that require attention to influence behavior¹³⁻¹⁶. For example, the domain “Knowledge” can influence how DSPs think about a healthy lifestyle. The TDF is based on different psychological theories relevant for behavioral change¹³. A validated version of the TDF consists of 14 domains encompassing influences on behavior and particularly on the health domain¹⁴. Knowledge about attitude can stimulate cooperation in teams of DSPs to improve attitude and thus increase healthy lifestyle support. However, there is a lack of knowledge about the attitude of DSPs.

To evaluate this, a questionnaire was developed focusing on physical activity: the Attitude of DSPs for Health Enhancing Physical Activity (ADSP-HEPA). However, no instrument is available to measure DSPs’ attitudes toward healthy nutrition. The ADSP-HEPA may potentially be a valid and reliable instrument in other lifestyle areas. The ADSP-HEPA is a brief, feasible attitude questionnaire that is easy to use in daily practice. It was developed by¹⁰ in two stages. Firstly, it was composed based on literature about the refined TDF^{13,14}. All of the items are based on the domains of the refined TDF; these items are changeable determinants. These domains influence DSPs’ support of a healthy lifestyle^{13,14}. DSPs, for example, require knowledge and skills to support people with moderate to profound intellectual disabilities in living a healthy lifestyle¹⁷. The original questionnaire is improved through consulting DSPs and researchers with expertise of health promotion for people with intellectual disabilities. Secondly, the most valid and reliable items were preserved on the basis of a confirmatory factor analysis (CFA) and item response analyses. The final version of

the ADSP-HEPA questionnaire consisted of the strongest items of each domain of the TDF contributing to the general concept of attitude¹⁰.

A questionnaire measuring the attitude towards nutrition can be used to develop, improve, and adapt interventions related to the nutrition needs of DSPs and evaluate them. This attention for healthy nutrition of people with intellectual disabilities is needed because of their generally unhealthy diets^{3,18} and the consequences of being under- or overweight¹⁹. For this study, the ADSP-HEPA questionnaire was adapted in consultation with the original authors to the Health Enhancing Nutrition for people with intellectual disabilities (ADSP-HENU). To ensure if it can be used in clinical practice, it is important to investigate its internal validity in terms of internal consistency and the contribution of each item to the total score of the questionnaire. Therefore, the aim of this study was to determine the internal validity of the adapted ADSP for nutrition (ADSP-HENU).

Method

Design

The ADSP-HEPA questionnaire was adapted in consultation with the original authors for Health Enhancing Nutrition for people with intellectual disabilities (ADSP-HENU). It was tested as part of a larger implementation study in which four residential facilities and/or day activity centres from four different care provider organizations were participating.

Participants

DSPs working within four teams participated in the study; they support people with moderate to profound intellectual disabilities (≥ 18 years). DSPs completed both the ADSP-HEPA and the ADSP-HENU. Only fully completed questionnaires were included in this study; one DSP did not complete it. Informed consent was obtained in the larger implementation study. The Medical Ethical Committee of the University Medical Centre Groningen gave dispensation to conduct this study (study number: 201700164). Participation was voluntary and of no consequence to the work evaluations or rewards of the DSPs, and their answers were analyzed anonymously. A total of 31 DSPs from four different care providers across the Netherlands participated in this study. Table 1 depicts the characteristics of the participating DSPs.

Table 1 | *Characteristics of DSPs (n=31)*

Age in years, mean (SD)	34 (11)
Gender female, n	25
Education, n	
Senior secondary vocational education: Educational theory	11
Senior secondary vocational education: Nursing	2
University of applied sciences: Educational theory	11
University	1
Other:	6
Supplemental lifestyle training, Yes	7
Work setting, n	
Residential facility	11
Day activity centre	5
Combination group	15
Years of experience with people with ID, mean (SD)	11 (10)

Instrument

The psychometric properties of the ADSP-HEPA were examined in a previous study ($n=195$)¹⁰. A Confirmatory Factor Analysis was performed to investigate the association between domains, the associations of the items with the corresponding underlying factor, and to pre-select items that are sufficiently associated with the factor measuring attitude. This analysis showed that there was one generic factor to measure attitude as the underlying construct with a correlation of 0.90. The Cronbach's Alpha for internal consistency of the questionnaire was 0.71 and acceptable. The Cronbach's Alpha if item deleted varied from 0.65 to 0.70 and was thus "questionable" to "acceptable"²⁰. Finally, the non-parametric item response theory (NIRT) showed that all expected scores were monotonically increasing with sufficiently small confidence bounds. The point polyserial correlations were sufficient¹⁰.

Adaptation ADSP-HEPA to ADSP-HENU

First, the first author adapted the ADSP-HEPA in order to measure the attitudes of DSPs for nutrition. This adapted version almost completely corresponds to the original questionnaire except for direct translations of physical activity to nutrition. Therefore, the terms about physical activity were replaced by terms concerning nutrition. For example, the question "*I think I am well aware of the exercise and physical activity recommendations for persons with ID*" was adapted to "*I think I am well aware of the nutrition recommendations for persons with ID*". This adapted questionnaire closely adhered to the original questionnaire as much as

possible (see Table 2). This version was then adapted in consultation with AW and the original author¹⁰ which led to minor revisions.

Data collection in DSPs

Table 2 demonstrates the resulting attitude questionnaires ADSP-HENU and ADSP-HEPA for DSPs (see also Appendix 2 for the ADSP-HENU). The ADSP-HENU was completed by the 31 recruited DSPs. The attitude questions were answered on a 5-point Likert Scale and ranged from “totally disagree” to “totally agree”. A higher sum score indicates a more positive attitude towards a healthy lifestyle.

Table 2 | *Attitude questionnaire for DSPs for Health Enhancing Physical Activity and Nutrition*

Question number and topic	Item (statement about attitude)
ADSP-HEPA*	
1 - Knowledge	I think I am well aware of the exercise and physical activity recommendations for persons with ID.
2 - Skills/Self-efficacy/ Beliefs about capabilities	I think I have enough practical knowledge and skills to set up and carry out physical/moving activities.
3 - Environmental Context and Resources	I think I have enough (game) materials to carry out physical activities.
4 - Social Influences	I feel supported by my superiors/managers when encouraging persons with ID to be enough physically active.
5 - Social/Professional Role and Identity	I believe that being physically active is so important that I will do anything to plan it in the daycare program of persons with ID.
6 - Outcome expectancy/ Beliefs about consequences	I think supporting physical activity is a fun part of my work.
ADSP-HENU**	
1 - Knowledge	I think I am well aware of the nutrition recommendations for persons with ID.
2 - Skills/Self-efficacy/ Beliefs about capabilities	I think I have enough practical knowledge and skills to set up and carry out healthy nutrition activities.
3 - Environmental Context and Resources	I think I have enough (kitchen) materials and healthy products to support healthy nutrition for people with ID.
4 - Social Influences	I feel supported by my superiors/managers when encouraging persons with ID to eat and drink healthily.
5 - Social/Professional Role and Identity	I believe that healthy nutrition is so important that I will do anything to make time for healthy nutrition of persons with ID.
6 - Outcome expectancy/ Beliefs about consequences	I think supporting healthy nutrition is a fun part of my work.
* ADSP-HEPA: Attitude of DSPs for Health Enhancing Physical Activity	
** ADSP-HENU: Attitude of DSPs for Health Enhancing Nutrition	

Data-analyses

The internal validity of the ASDP-HENU was analyzed using the statistical programming language R²¹ and statistical software package SPSS. Cronbach's Alpha was calculated to measure the internal consistency for which coefficients from 0.60 to 0.70 were interpreted as "questionable", 0.70 to 0.80 were interpreted as "acceptable", and >0.80 was interpreted as "good"²⁰. The Cronbach's Alpha if item deleted was calculated in order to indicate the contribution of each item to the questionnaire. Additionally, the internal validity of the questionnaire was analyzed with the NIRT²² using point-serial correlations and monotonicity. As these are correlations between items and a latent trait, we adopted the nomenclature for interpreting factor loadings as follows: correlations <0.40 were weak, 0.40-0.60 were moderate, and ≥ 0.60 were strong²³. These analyses were supportive to the descriptive representation of the way in which item scores were associated with the underlying construct of attitude given the relatively small sample size.

Results

Internal validity of ADSP-HENU

The Alpha coefficient for the ADSP-HENU was 0.87 (95% CI [0.81-0.94]). Taking the confidence intervals (CI) into account, Alpha was sufficient. The reliability of the ADSP-HENU scale was good; when one item was deleted from the questionnaire, the Alpha coefficient did not increase (see Table 3).

All detailed item characteristic curves presented in the Appendix give the expected item versus expected total attitude scores together with their smoothened spline NIRT item curves. The latter reveal that the item category scores do monotonically increase with the attitude scale (see Appendix 1)^{22,24,25}. Its 95 percent confidence bounds were somewhat wide. The figures demonstrate that, on average, DSPs who have low expected total scores tend to score low on an item whereas DSPs who have high expected total scores tend to score high on an item. The point polyserial correlations (loadings) between the attitude latent trait, and the items were all ascertained to be strong (see Table 3)²³.

Table 3 | *Cronbach's Alpha if item deleted and point polyserial correlations for ADSP-HENU*

	Cronbach's Alpha if item deleted	Point polyserial correlation
1 - Knowledge	0.86	0.78
2 - Skills/Self-efficacy/Beliefs about capabilities	0.83	0.89
3 - Environmental Context and Resources	0.87	0.67
4 - Social Influences	0.85	0.81
5 - Social/Professional Role and Identity	0.85	0.79
6 - Outcome expectancy/Beliefs about consequences	0.86	0.77

Discussion

Principal findings

The aim of this study was to determine the internal validity of the adapted ADSP for nutrition (ADSP-HENU). Results indicate adequate internal validity of the ADSP-HENU; the Alpha coefficient for internal consistency was good. NIRT shows that the expected item scores are monotonically increasing with the expected total scores, indicating that each item attributes to the overall attitude that is measured. The wide confidence bounds in the NIRT can be due to the relatively small sample size, therefore, these results are supportive. Despite the small sample size, the current data provide promising results on the reliability of the ADSP-HENU. In comparison with the larger study of the ADSP-HEPA, the Cronbach's Alpha for physical activity was acceptable for the six items, and the NIRT for physical activity shows monotonicity with small confidence bounds¹⁰. Therefore, both questionnaires are reliable measures for DSPs' attitudes toward physical activity and nutrition¹⁰.

The ADSP-HENU is a brief attitude questionnaire that is easy to use in daily practice, for example, before and after education to evaluate attitude over time. This questionnaire can be used in combination with the ADSP-HEPA to gather knowledge about the needed attention to the concepts physical activity and nutrition in an intervention. In addition, each question on it represents a domain of the TDF which provides additional knowledge about which domain(s) requires specific attention regarding attitudes. For the two concepts, physical activity and nutrition, the attitude questionnaire shows good reliability. It can likely be used for other healthy lifestyle concepts as well such as smoking, alcohol use, and relaxation. To influence the attitudes of DSPs, following additional training on healthy lifestyles is important^{10,26}. A positive attitude of DSPs towards healthy lifestyles is a condition for actual implementation of healthy lifestyle behaviour^{8,9}.

Strengths and limitations

A strength of this study is that it provides a first evaluation of the internal validity of a feasible instrument to measure attitudes of DSPs in the domain of healthy nutrition. A limitation is the relatively small sample size, therefore, the NIRT was supportive in the analysis of the internal validity of the questionnaire. These above results may therefore be interpreted as somewhat preliminary but nevertheless promising. However, it may be noted that small sample sizes are relatively common in research for people with moderate to profound ID^{27,28}. Despite this, rigour statistical analyses could be performed with the NIRT with promising results. In addition, the ADSP-HENU was theoretically based on an existing questionnaire that was developed within a study with a large sample size¹⁰.

Implications

Attitude questionnaires can be used to evaluate interventions related to a healthy lifestyle and to adapt interventions to the needs of DSPs. Further research should confirm the psychometric properties of the ADSP-HENU. As such, it would cover a larger part of the domain of scores and make confidence intervals smaller in size. Additionally, for further research, the current basic concept underlying the construction of the attitude questionnaire may be explored for other healthy lifestyle domains, for example, for the attitude of DSPs towards smoking.

Conclusion

This study resulted in a feasible questionnaire to measure DSPs' attitudes related to health enhancing nutrition. This study showed the ADSP-HENU is a promising instrument with favorable internal validity to use for nutrition attitude measurements, and it is easy to use in daily practice for evaluation and to develop, improve, or adapt interventions to DSPs' needs.

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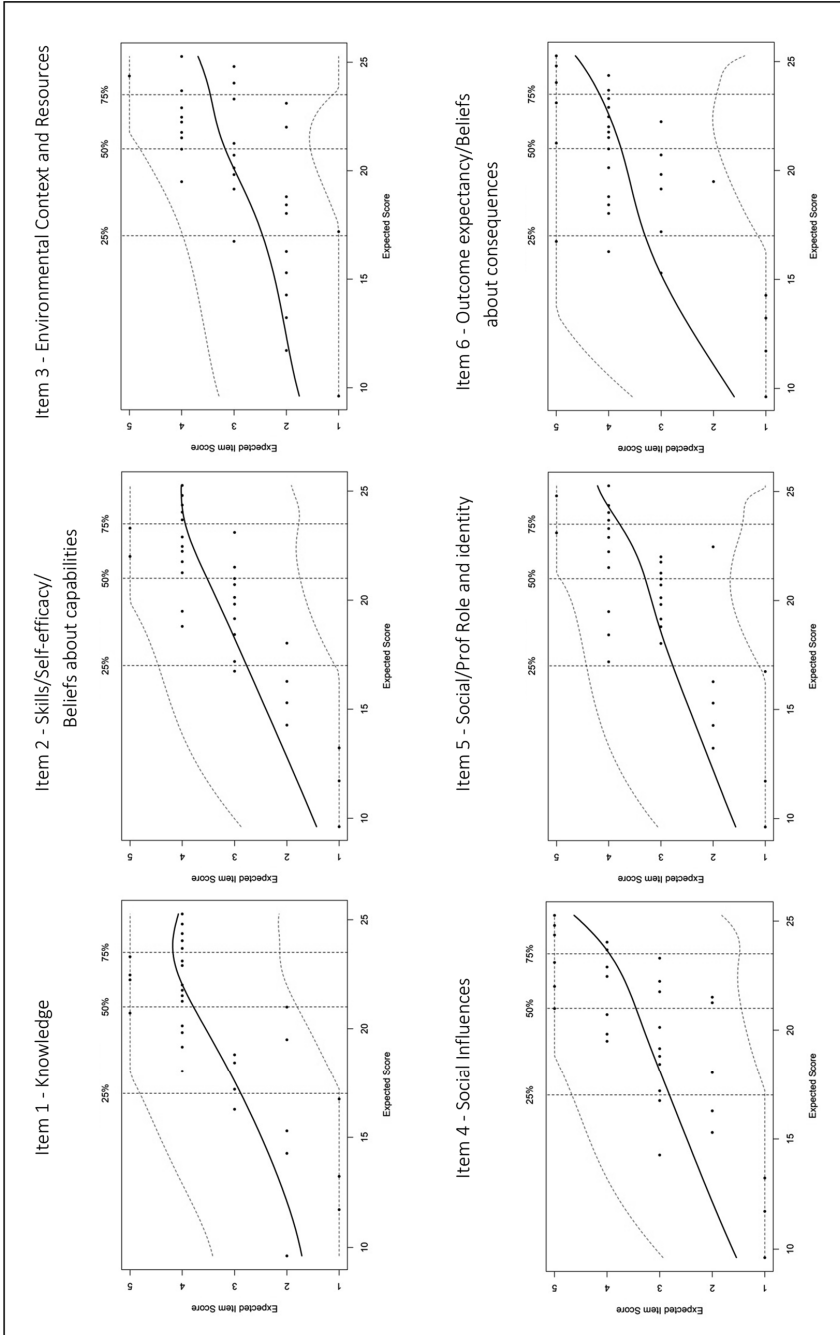
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Appendix 1

Expected attitude scores per item on nutrition with 95% confidence bounds.



Appendix 2

Questionnaire evaluating Attitude of Direct Support Professionals towards health enhancing nutrition of people with intellectual disabilities (ADSP-HENU)

Aim:	This six-item questionnaire measures how Direct Support Professionals think about stimulating and motivating of healthiness of nutrition of the persons with intellectual disabilities they support.				
Target group:	Direct support professionals of people with intellectual disabilities in daily care.				
Instructions for participant:	This questionnaire consists of various statements about how you think and feel about stimulating and motivating healthy nutrition of people with ID you support. The items are about your own feeling or opinion, so your answers are not right or wrong. Completing the questionnaire takes about 2 minutes.				
Scoring:	You can score on the following 6 items/statement with: “totally disagree”, “partly disagree”, “neutral”, “partly agree”, and “totally agree”				
Items (statements about attitude)					
	1 Totally disagree	2 Partially disagree	3 Neutral	4 Partially agree	5 Totally agree
I think I am well aware of the nutrition recommendations for persons with intellectual disabilities.					
I think I have enough practical knowledge and skills to set up and carry out healthy nutrition activities.					
I think I have enough (kitchen) materials and healthy products to support healthy nutrition for people with intellectual disabilities.					
I feel supported by my superiors/managers when encouraging persons with intellectual disabilities to eat and drink healthily.					
I believe that healthy nutrition is so important that I will do anything to make time for healthy nutrition of persons with intellectual disabilities.					
I think supporting healthy nutrition is a fun part of my work.					
<p>Instructions for the researcher: <i>After completing the questionnaire by a direct support professional, the sum score can be calculated by adding all six scores.</i></p> <p>Attitude sum score:* <input style="width: 100px; height: 20px;" type="text"/></p> <p><i>*The minimum possible attitude sum score is 6, the maximum score is 30. The higher the attitude sum score, the more positive caregivers think about stimulating and motivating of healthy nutrition for people with intellectual disabilities they support.</i></p>					

