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ORIGINAL ARTICLE

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Assessing losses and gains with ageing: the psychometric properties of the Polish version of the Attitudes to Ageing Questionnaire

BACKGROUND
The Attitudes to Ageing Questionnaire (AAQ) is a measure designed for cross-cultural comparisons of attitudes to ageing from the perspective of older adults. The article presents a cultural and linguistic adaptation of the AAQ for use with Polish-speaking people.

PARTICIPANTS AND PROCEDURE
The Polish translation of the AAQ-24, Personal Wellbeing Index, Geriatric Depression Scale and demographic and health survey were administered to 500 older adult participants living in Poland: 269 women (53.8%) and 231 men (46.2%), aged 60 to 86 (M = 66.75, SD = 5.10).

RESULTS
Similar to other translations of the AAQ, analyses confirmed a three-factor structure for the AAQ. Factor structure was confirmed as: psychosocial loss, physical change, and psychological growth. The tool was found to have good validity based on confirmatory factor analysis, as well as satisfactory latent construct reliability and internal consistency (Cronbach's α and H coefficient > .70 for all subscales). Test-retest reliability in a three-week interval was good (intraclass correlation coefficient (ICC) ranged between .86 and .91, $p < .01$, for all subscales). The AAQ-24-PL shows appropriate convergent and divergent validity. Demographic differences in AAQ-24-PL were also found.

CONCLUSIONS
The results confirm the validity and reliability of the AAQ-24-PL, and this useful tool demonstrates acceptable psychometric performance. Researchers and practitioners working with older adults can benefit from using this tool to assess losses and gains with ageing.

KEY WORDS
attitudes to aging; questionnaire; older adults; measurement; validation; healthy aging

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BACKGROUND

Older people are the fastest growing section of the world's population, and by 2050 the number of older people will be twice that of children aged 5 years and under (United Nations, 2022). It is vital that we develop a contemporary understanding of the experience of aging (Chu et al., 2020), and for this psychometrically robust measures of aging are needed. Previous efforts to gauge perceptions of aging have been made by soliciting opinions from younger individuals about their own perspectives on aging or their views on older people (Boduroglu et al., 2006; Kogan, 1961). A more valid viewpoint measures and understands older people's attitudes towards one's own aging. These methods provide a more nuanced dynamic insight into aging (Thelu et al., 2022) and can influence education practice to challenge age stereotypes (Martínez-Arnau et al., 2022).

Currently, one of the most commonly used psychological tools for measuring attitudes towards old age is the Attitude to Ageing Questionnaire (AAQ; Laidlaw et al., 2007, 2018). However, there is no Polish version of this questionnaire. The proportion of older adults in the population of Poland is systematically increasing, and the percentage of individuals above the age of 60 in the general population has currently reached the level of 25.7% (Statistics Poland, 2022).

The AAQ was developed in accordance with WHO Quality of Life (WHOQOL) methodology involving 19 countries representing a wide range of cultures. The AAQ was designed as a cross-cultural reliable and valid 24-item measure to investigate subjective experiences and attitudes towards personal aging in elderly individuals (Laidlaw et al., 2007). It assesses aging-related stereotypes and evaluates both losses and gains associated with the aging process. It examines an individual's perspective on aging from two different aspects: general attitudes towards aging and a more personal experiential component reflecting one's unique subjective experience of aging. The AAQ measures domains such as psychosocial loss (PL), physical change (PC), and psychological growth (PG). The PL domain specifically targets psychosocial losses that are relevant to elderly individuals, depicting old age primarily as a negative experience characterized by psychological and social decline. The PC domain has a broader focus on physical functioning, encompassing items related to health, exercise, and the subjective experience of the aging process. The PG scale has an explicit emphasis on positive aspects of aging, reflecting both personal and interpersonal positive gains that may come as surprises related to the aging process.

There are numerous national adaptations of the AAQ, including Brazilian (Chachamovich et al., 2008), Norwegian and Canadian (Kalfoss, 2017; Kalfoss et al., 2010), Turkish (Eser et al., 2011), Spanish (Lucas-Carrasco et al., 2013), French (Marquet et al., 2016), Persian (Rejeh et al., 2017), Iranian (Farsi) (Rejeh et al., 2017), Malay (Rejab et al., 2022) and Portuguese versions (Pedroso de Lima et al., 2022). The original version of the tool is also available in a 12 item short-form (Laidlaw et al., 2018).

In previous studies, attitudes to aging tend to be associated with better well-being, quality of life and health outcomes in older adults (Korkmaz Aslan et al., 2019; Liu et al., 2020; Low et al., 2013; Top & Dikmetaş, 2015) and, generally speaking, may strengthen successful aging processes (Kisvetrová et al., 2022; Kunuroglu & Vural Yuzbasi, 2021).

THE PRESENT STUDY

The aim of the present study was to develop a Polish language version of the AAQ-24 and then evaluate the technical adequacy of the measure (AAQ-24-PL) in a sample of older adults in Poland. The following research questions were investigated:

- What is the structural validity, internal consistency and test-retest reliability of the AAQ-24-PL?
- What are mean-level differences in attitudes to aging with different demographic characteristics?
- What is the convergent validity of the AAQ-24-PL?

As many of the adapted versions in various countries were found to have an identical internal structure to the original AAQ-24 measurement model consisting of a three-factor latent structure (e.g. Laidlaw et al., 2007; Lucas-Carrasco et al., 2013; Pedroso de Lima et al., 2022; Rejeh et al., 2017), it was anticipated that this would also be the case for the Polish language version and sample. It was predicted that the AAQ-24-PL would achieve at least minimally acceptable latent factor reliability and internal consistency reliability for all subscales. In addition, high test-retest reliability (absolute stability) was anticipated over an interval of three weeks. Also, the AAQ-24-PL scores were expected to be significantly positively associated with wellbeing and subjective health, and negatively correlated with depressive symptoms; the scores were also expected to differentiate demographic traits.

PARTICIPANTS AND PROCEDURE

PROCEDURE AND DATA COLLECTION

The study used a cross-sectional design with purposeful sample selection. Data were collected between June 2022 and July 2022 by computer-assisted web interview (CAWI). Participants recruited from the Polish National Panel were informed about the purpose of the research and instructed on how to complete

the tests. Participation in the study was anonymous and voluntary. The inclusion criteria were age 60 and above with ability to provide informed consent. Of the 972 people approached, 500 completed the survey (51% response rate).

After three weeks, the suggested period for measuring stable attitudes (Streiner & Norman, 2008), half of the respondents, i.e. 253 people (51% response rate), were evaluated a second time.

The research was conducted in accordance with the Helsinki Declaration of Human Rights (WMA, 2013). The study protocol was approved by the Research Ethics Board at the University of Lodz (approval number 5/KEBN-UŁ/III/2021-22).

POLISH LANGUAGE ADAPTATION OF THE AAQ-24

The original English version of the AAQ-24 was obtained from the original author, Ken Laidlaw (Laidlaw et al., 2007), with permission to conduct research into a Polish adaptation. The measure was then translated into Polish, following the guidelines for test adaptation issued by the International Test Commission (2017) and assessment in psychology (Weiner et al., 2012). In the first stage, two independent bilingual translators translated the original statements from English into Polish (forward translation). Next, a team of competent judges was formed, consisting of five psychologists: all were researchers and practitioners, two of whom worked in gerontopsychology and three were in general and health psychology. This selection of judges was intended to provide a diverse set of views about attitudes to aging items. The judges discussed the Polish translation and reached a consensus on discrepancies, particularly semantic appropriateness and understandability for older people in the Polish cultural context. After minor revisions, statements were translated back into English (back-translation) by a third independent translator who was a native English speaker. The semantic equivalence and validity of the two versions were ensured by three other experts: a translator and two gerontopsychologists.

PILOT STUDY

A pilot study including 50 people (37 women and 13 men) aged 60 to 84 was conducted to verify the appropriateness of the research procedure and to provide feedback regarding the comprehensibility of instructions and questions of the AAQ-24-PL. The pilot study resulted in minor changes, for example, items in which a double negative were required (item 11 – *I don't feel old*; item 13 – *My identity is not defined by my age*; item 16 – *Problems with my physical health do not hold me back from doing what I want to*) were transformed into a positive frame with a reverse scoring system applied to keep scores consistent with the original AAQ. The 5-point Likert-type response scale was retained.

PARTICIPANTS

The study group included 500 participants, 269 women (53.8%) and 231 men (46.2%), aged 60 to 86 (M = 66.75, SD = 5.10). Of these, 18.6% were rural residents, 40.2% lived in small towns with up to 100,000 residents, and 41.2% lived in a larger city of over 100,000 residents. The majority of respondents had a secondary education (49.8%), 40.9% had completed higher education, and 10.2% had a vocational or basic education. In addition, 65.8% of the respondents lived in a relationship while 34.2% were single. Most participants were retired or professionally inactive (76.2%). The mean self-rated health score was 6.19 based on a 10-point scale from 1 (*very bad*) to 10 (*very good*).

MEASURES

Attitudes to aging were measured by the Polish version of the Attitudes to Aging Questionnaire (AAQ-24-PL). The Polish version of the AAQ-24 consisted of the same number of items as the original (n = 24) and was intended to represent the same three constructs: psychosocial loss (PL; e.g. *Old age is a time of loneliness*), psychological growth (PG; e.g. *There are many pleasant things about growing older*), and physical change (PC; e.g. *My health is better than I expected for my age*). Each subscale comprised eight items measured on a 5-point Likert scale. Therefore, the scores on each subscale ranged from 8 to 40, with a higher score indicating a more positive attitude towards one's own aging process in that area.

Depressive symptoms were measured by the Polish version of the Geriatric Depression Scale (GDS; Albiński et al., 2011; Yesavage et al., 1982). The 15-item form of the scale was chosen, in which the respondent indicates the presence of symptoms within the previous two weeks using a yes/no response format. GDS total scores indicate a lack of depressive symptoms (0-5 points) or risk of depression (6-15 points). The tool demonstrated good internal consistency in the current study (Cronbach's α was .87).

Subjective wellbeing was assessed by the Polish language version of the eight-item Personal Wellbeing Index (PWI; Cummins et al., 2003; Żemojtel-Piotrowska et al., 2017), measuring satisfaction with various life domains: (1) standard of living, (2) health, (3) life achievements, (4) personal relationships, (5) personal safety, (6) community connectedness, (7) future security, and (8) religion and spirituality. Participants rate

how satisfied they are on an 11-point end-defined scale, from 0 (*no satisfaction at all*) to 10 (*completely satisfied*). The reliability of the tool was excellent in the current study (Cronbach's α = .90).

Self-rated health was assessed by a numeric version of the visual analog scale ranging from 1 to 10, with the question: "In my opinion, my general health status is…" with reply alternatives ranging from 1 (*very bad*) to 10 (*very good*). The respondents were asked to circle the point corresponding to their current state of health.

Sociodemographic status was assessed by a purpose-developed questionnaire which collected information about sex (1 – men, 2 – woman), age (number of years), place of living (1 – village, 2 – towns with up to 100,000 residents, 3 – larger city of over 100,000 residents), education level (1 – primary or basic vocational, 2 – secondary, 3 – higher), marital status (1 – single, 2 – in relationship), and current professional activity (1 – no, 2 – yes).

DATA ANALYSIS

The data were analyzed using SPSS Statistics and AMOS SPSS version 28. The preliminary analyses included descriptive statistics, and the assumption of normality was checked using kurtosis and skewness scores. To examine structural validity, the factorial validity of the measure was evaluated: the latent structure of the Polish version of the AAQ was investigated using confirmatory factor analysis (CFA) based on the maximum likelihood (ML) method. Model validity was evaluated using data-model fit statistics in conjunction with factor loadings (λ) and other parameter estimates; latent construct reliability was also established (Kenny, 2020; Mueller & Hancock, 2011). The internal consistency of the questionnaire was determined on the basis of Cronbach's alpha (α). The test-retest reliability (absolute stability) of a measure was assessed over a three-week interval using Pearson product-moment correlations and intraclass correlation coefficients (ICC) (Streiner & Norman, 2008; Ten Berge & Sočan, 2004). Differences in general attitudes to aging and its dimensions across sociodemographic variables were checked by independent *t*-test and one-way ANOVA analysis. The convergent validity of the measure was estimated by Pearson's correlational analysis (*r*) between AAQ-24-PL and Personal Wellbeing Index (PWI-8), Self-Rated Health numerical scale (SRH) and Geriatric Depression Scale (GDS) scores. The required minimum sample size for all types of analyses was determined by performing a priori power analysis using G*Power 3.1 software (Faul et al., 2007). The recommended minimum sample size for structural equation modeling (SEM) of 200 (Kline, 2015) was exceeded in the current study.

RESULTS

DESCRIPTIVE STATISTICS

Kolmogorov-Smirnov test results indicated that the distributions of the tool items and two subscales were non-normal. However, departures from normality were mild and skewness < |2| and kurtosis scores < |7| indicated that the assumptions of normality were met (Tabachnick & Fidell, 2019).

Detailed descriptive statistics for AAQ-24-PL items and scales are presented in Table 1.

STRUCTURAL VALIDITY

The latent structure of the Polish version of the AAQ-24-PL was investigated using confirmatory factor analysis (CFA) with the maximum likelihood (ML) method. The assumptions of the ML were met, i.e. large sample size, with indicators following a continuous and multivariate normal distribution. Eighteen cases were characterized as significant multivariate outliers based on the Mahalanobis distance and were removed from further analyses (Tabachnick & Fidell, 2019).

The results of the initial CFA structured the 24 items as indicators of three fully correlated latent factors (PL, PC, PG). Taking all indices into account, the results indicated adequate data-model fit and acceptably reflected the theoretical structure of the analyzed data system: CMIN/*df* = 3.58, RMR = 0.07, CFI = 0.85, RMSEA = 0.07, 95% CI [0.06-0.08], GFI = 0.86, AGFI = 0.83, NFI = 0.81, IFI = 0.86, TLI = 0.83. The analysis revealed that the chosen theoretical construct had a significant influence on the variability of scores for specific items (see Table 2). The model was characterized by significant factor loadings (λ) for each latent construct. However, two items from the PC factor (item 7 – *It is important to take exercise at any age*; item 13 – *My identity is defined by my age*) and one item from the PG scale (item 4 – *Wisdom comes with age*) had relatively lower factor loadings (λ < .40).

Further analysis indicated significant correlations between subscales PL and PC (r = .86, p < .001), PL and PG (r = .68, p < .001), and PC and PG (r = .66, p < .001). The analysis found the three-factor model to be well fitted to the data, and the test measurements were a strong and accurate expression of the latent variables. Adequate-to-strong latent construct reliabilities were also established for all factors in the model (PL H = .86, PC H = .83, PG H = .77) (Mueller & Hancock, 2011).

INTERNAL CONSISTENCY RELIABILITY

The internal consistency reliability of all items of the scale was assessed using Cronbach's α internal con-

Table 1

Descriptive statistics and distributions for AAQ-24-PL items and subscales

Subscale/item	*M*	*SD*	Min	Max	*Sk*	Kurt	K-S
Psychosocial loss	26.34	6.33	8	40	−0.10	−0.58	.07*
AAQ3	3.29	1.14	1	5	−0.34	−0.81	.24*
AAQ6	3.19	1.17	1	5	−0.17	−0.94	.21*
AAQ9	3.46	1.08	1	5	−0.26	−0.84	.22*
AAQ12	3.63	1.06	1	5	−0.41	−0.59	.22*
AAQ15	2.94	1.14	1	5	0.30	−0.99	.25*
AAQ17	3.45	1.20	1	5	−0.37	−0.89	.22*
AAQ20	2.87	1.13	1	5	0.23	−0.84	.22*
AAQ22	3.51	1.20	1	5	−0.33	−1.00	.21*
Physical change	27.05	5.36	10	40	−0.19	−0.01	.05
AAQ7	4.38	0.68	1	5	−1.25	3.09	.29*
AAQ8	3.25	1.02	1	5	−0.22	−0.62	.22*
AAQ11	3.55	1.15	1	5	−0.49	−0.64	.23*
AAQ13	3.01	1.09	1	5	0.27	−0.74	.19*
AAQ14	3.25	1.07	1	5	−0.23	−0.84	.24*
AAQ16	2.80	1.20	1	5	0.30	−0.94	.23*
AAQ23	3.25	1.15	1	5	−0.37	−0.75	.23*
AAQ24	3.57	1.04	1	5	−0.64	0.01	.25*
Psychological growth	29.52	4.30	13	40	−0.37	0.49	.11*
AAQ1	3.18	0.97	1	5	−0.36	−0.26	.20*
AAQ2	3.58	1.09	1	5	−0.76	0.01	.28*
AAQ4	3.85	0.85	1	5	−0.81	0.95	.31*
AAQ5	3.58	0.92	1	5	−0.64	0.05	.30*
AAQ10	3.47	0.99	1	5	−0.47	−0.34	.26*
AAQ18	3.91	0.79	1	5	−0.72	1.22	.29*
AAQ19	4.05	0.81	1	5	−0.83	0.87	.28*
AAQ21	3.91	0.84	1	5	−0.78	0.91	.29*
AAQ – total score	82.92	13.33	44	120	0.03	−0.24	.04*

Note. AAQ – Attitudes to Ageing Questionnaire; Sk – skewness; Kurt – kurtosis; K-S – Kolmogorov-Smirnov test of normality; *$p < .05$.

sistency coefficient for the three factors: PL α = .84, PC α = .78, PG α = .73. A value of .89 was also noted for the overall score, indicating satisfactory reliability (Tabachnick & Fidell, 2019).

TEST-RETEST RELIABILITY

After three weeks, i.e. the recommended period for measuring attitude stability (Streiner & Norman, 2008), half of the respondents (253 people; 51% response rate) were retested. Pearson correlation coefficients between the total AAQ-24-PL total score for first (M = 82.92, SD = 13.33) and second (M = 83.75, SD = 13.30) measurements were calculated as r_{tt} = .87 ($p < .001$). Intraclass correlation coefficients (ICC) were reported as .93, with a 95% confidence interval between .91 and .95, indicating excellent interrater reliability. Results of analyses for AAQ-24-PL subscales were as follows: PL: r_{tt} = .80, $p < .001$, ICC = .89, 95% CI [.86; .91]; PC: r_{tt} = .83, $p < .001$, ICC = .91, 95% CI [.88; .93]; PG: r_{tt} = .75, $p < .001$, ICC = .86, 95% CI [.81; .89].

Table 2

Results of confirmatory factor analysis

Factors	Item no.	R^2	β	*B*	*SE*	CR
Psychosocial loss	AAQ3	.34	.59	1.00		
	AAQ6	.48	.69	1.21	.09	14.34**
	AAQ9	.25	.50	0.81	.09	9.22**
	AAQ12	.50	.70	1.11	.09	11.85**
	AAQ15	.37	.61	1.03	.10	10.82**
	AAQ17	.49	.70	1.28	.11	11.84**
	AAQ20	.34	.59	0.99	.10	10.43**
	AAQ22	.58	.76	1.39	.11	12.48**
Physical change	AAQ7	.09	.31	1.00		
	AAQ8	.23	.48	2.33	.42	5.63**
	AAQ11	.60	.78	4.30	.68	−6.29**
	AAQ13	.09	.29	−1.55	.34	−4.52**
	AAQ14	.49	.70	3.65	.59	6.19**
	AAQ16	.39	.63	3.52	.58	−6.06**
	AAQ23	.43	.65	3.61	.59	6.10**
	AAQ24	.33	.57	2.90	.44	6.56**
Psychological growth	AAQ1	.20	.45	1.00		
	AAQ2	.15	.39	0.98	.16	6.25**
	AAQ4	.07	.26	0.51	.11	4.66**
	AAQ5	.45	.67	1.41	.17	8.43**
	AAQ10	.33	.57	1.32	.17	7.87**
	AAQ18	.18	.42	0.77	.12	6.57**
	AAQ19	.53	.73	1.36	.16	8.65**
	AAQ21	.25	.50	0.95	.13	7.32**

Note. AAAQ – Attitudes to Ageing Questionnaire; β – standardized regression coefficient; B – non-standardized regression coefficient; CR – critical ratio; $^{**}p < .01$.

AAQ SCORES BY DEMOGRAPHIC CHARACTERISTICS

AAQ-24-PL scores were correlated with age and education level, then compared between subgroups according to gender, marital status, living arrangements and professional activity.

Participant age did not significantly correlate with the scores of the measure ($p > .05$). However, significant, but weak, positive correlations were observed between education and PL scale ($r = .14$, $p = .002$), PC ($r = .15$, $p < .001$) and general score ($r = .14$, $p = .002$); however, no significant correlation was noted for the PG scale. Higher education scores were associated with more positive attitudes to aging.

No gender differences were observed between the scores ($p > .05$). For marital status, significant differences were noted only in the PL scale, but these were weak ($t(498) = -2.05$, $p = .041$, Cohen's $d = .17$); in addition, single participants had lower scores than those who were married. Professional activity differentiated scores on the PL subscale ($t(498) = 2.82$, $p = .005$, Cohen's $d = -.30$) and PC scale ($t(498) = 4.86$, $p < .001$, Cohen's $d = -.51$) and the overall result ($t(498) = 3.66$, $p < .001$, Cohen's $d = .38$). No differences were observed for the PG scale. Living arrangement did not differentiate AAQ scores ($p > .05$).

CONVERGENT VALIDITY

Convergent validity was assessed by correlating the AAQ-24-PL scores with wellbeing (PWI), self-rated health (SRH) and geriatric depression symptoms

(GDS). Positive moderate correlations ($p < .01$) were found with subjective wellbeing (PWI) and subjectively perceived general health (SRH). A significant negative correlation was noted between AAQ scores and geriatric depression symptoms (GDS). Correlation coefficients between variables are given in Table 3.

Table 3

Validity of the AAQ-24-PL based on the bivariate correlations with criterion scales

Variables	PWI	SRH	GDS
Psychosocial loss	.41**	.41**	−.64**
Physical change	.64**	.64**	−.63**
Psychological growth	.21**	.21**	−.42**
Attitudes to aging – total score	.52**	.52**	−.69**

Note. AAQ – Attitudes to Ageing Questionnaire; PWI – Personal Wellbeing Index; SRH – Self-Rated Health; GDS – Geriatric Depression Scale; **$p < .001$.

DISCUSSION

The aim of the present study was to develop a Polish language adaptation of the AAQ-24 (AAQ-24-PL). The study also determined mean-level differences in AAQ-24-PL scores with regard to demographic variables and tested the convergent and divergent validity of the tool.

The original AAQ-24 (Laidlaw et al., 2007) using classical and modern psychometric analyses with a large international sample produced a three-factor solution for the AAQ, later confirmed with the development of the AAQ short form (Laidlaw et al., 2018). This structure has been confirmed in a number of national validations (Chachamovich et al., 2008; Lucas-Carrasco et al., 2013; Pedroso de Lima et al., 2022; Rejeh et al., 2017). Hence it was decided to replicate a three-factor structure for the Polish sample. CFA results in the present study indicate that the Polish version is consistent with the factor structure of the original AAQ-24. Despite this, other national studies have shown that older adults may view aging differently depending on their culture (Kalfoss et al., 2010; Pedroso de Lima et al., 2022; Rejab et al., 2022).

It must also be noted that, considering the fit indices in the current study, the model fits the data at only an acceptable level. However, their values are similar to those from the original international study (Laidlaw et al., 2007) and also the AAQ short form development study (Laidlaw et al., 2018). Moreover, various indices were used to make conclusions regarding adequacy of fit to the data (Kline, 2015). Several limitations and inconsistencies in interpretation of particular indicators may exist (e.g., RMSEA and CFI), which does not preclude adequate model fit, especially considering the theoretical background in test validation studies (e.g., Bellali et al., 2023; Chachamovich et al., 2008; Kline, 2015; Lai & Green, 2016).

The model was characterized by significant factor loadings for each latent construct, but two items from the PC and one from the PG subscale had factor loadings lower than the recommended threshold ($\lambda < .40$). This may result from the fact that the PC and PG subscales were reported in other studies to be less conceptually homogeneous, comprising different elements of nuanced constructs (Kalfoss et al., 2010; Laidlaw et al., 2018; Lucas-Carrasco et al., 2013; Marquet et al., 2016; Rejab et al., 2022). Cultural differences may also exist in assessing abovementioned characteristics (Kalfoss et al., 2010). However, as suggested by the authors of the Brazilian adaptation study (Chachamovich et al., 2008), slight misspecifications in the items should not necessitate crucial modifications in the scale format. Therefore, based on the underlying theory, the decision was made to keep these positions as they are in the original model. The loading values were significant and considered sufficient, taking into account their reliability and the characteristics of content analysis, as well as the prospect of further international research.

As predicted, the AAQ-24-PL demonstrated robust latent factor reliability and internal consistency reliability for all subscales and the total score. Cronbach's α values were similar to those observed in other validation studies, albeit with slightly lower values for the PG scale (Kalfoss et al., 2010; Lucas-Carrasco et al., 2013; Marquet et al., 2016). This may be due to a more diverse scale structure, utilizing both an experiential and general approach to aging. Hence, some caution should be observed when interpreting the results.

The current study shows high test-retest reliability, with moderate to strong Pearson's correlation coefficients and the intraclass correlation coefficients (ICC) between the two time periods. This is a strength of this study, as to date only two other studies have tested the time stability of the tool, obtaining similar results (Marquet et al., 2016; Rejeh et al., 2017).

In terms of mean-level differences in AAQ scores across demographic characteristics, consistent with many previous studies (Marquet et al., 2016; Rejeh et al., 2017; Top & Dikmetaş, 2015), but contrary to Kalfoss (2017), no differences were found between men and women with regard to the AAQ subscale or total score. Moreover, neither participant age nor place of living was significantly associated with scores ($p > .05$).

Education demonstrated significant, but weak, positive correlations with PL, PC and general score in this population. Higher education was associated with more positive attitudes to aging consistent with data reported by Lucas-Carrasco et al. (2013), Mar-

quet et al. (2016) and Rejeh et al. (2017). Individuals with higher levels of education appear to hold more positive perceptions of their physical functioning as they age and report fewer negative psychosocial losses. This finding suggests that education may provide individuals with additional personal resources that enable them to better adapt to age-related changes and maintain positive attitudes towards their own aging process.

Professionally active older adults and those who were married presented more positive attitudes toward aging than those who were retired or single. One possible explanation for this may be the presence of social support, which predicts more positive attitudes to aging (Lamont et al., 2017). Furthermore, retirement can be a two-edged sword in that while it provides increased opportunity to engage in hobbies and other pleasurable activities and affords reflection on the aging process, reduced income experienced may result in a more negative attitude to aging. Research suggests that how retirees spend their time in retirement, such as engaging in further education and volunteering, can have a positive impact on functioning (Zadworna, 2020).

The AAQ-24-PL scores demonstrated positive correlations with wellbeing and self-rated health among older adults, and negative correlations with geriatric depression symptoms, corroborating the convergent and divergent validity of the tool. The results are consistent with those of other international studies, reporting that more positive declared attitudes to aging tend to be associated with better quality of life, subjective health and wellbeing and lower depression and anxiety symptoms (Chachamovich et al., 2008; Kalfoss et al., 2010; Laidlaw et al., 2018; Lucas-Carrasco et al., 2013; Marquet et al., 2016). In addition, Yamada et al. (2015) propose that positive attitudes towards aging may help mitigate the negative impact of comorbidity on quality of life among in older adults. Another interesting cross-sectional study examining attitudes to ageing, measured using the AAQ and three biomarkers in 758 older adults revealed that a more positive attitude to physical change was associated with younger biological age and lower mortality (McLachlan et al., 2020). Attitudes towards aging seem to be a promising area of research regarding interventions on successful and healthy aging (Kunuroglu & Vural Yuzbasi, 2021; Laidlaw, 2010; Segel-Karpas et al., 2022; Yamada et al., 2015). Seah et al. (2019) found that short, culturally inclusive interventions were effective in enhancing attitudes towards aging. Interventions targeting attitudes towards aging could be a potential clinical approach for improving quality of life in older adults.

Given that aging is a ubiquitous phenomenon that is influenced by socio-cultural elements, it is crucial to have accurate measures that can be used effectively in a variety of circumstances. Such solid and reliable instruments could be used to perform reliable cross-cultural studies on attitudes regarding aging.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

Despite its important findings, the current study possesses several limitations. Firstly, cross-sectional studies are not suitable for identifying causal relationships. Secondly, the study was conducted by the computer-assisted web interview (CAWI) method in a group of relatively healthy, well-educated and relatively young older people. Moreover, the study uses self-reported survey measures which may be affected by social desirability biases. Lastly, due to only acceptable model fit, the data should be replicated in different settings, and the factor structure of the tool should be verified in distinct samples.

Despite these limitations, the findings help fill the gap in Polish-language tools assessing attitudes to aging. The AAQ-24-PL will enable Polish psychologists and gerontologists to perform national and cross-cultural research, thus greatly advancing understanding of how people experience their own aging. Further research is needed on the diversity of attitudes among seniors toward aging in different contexts and against the background of different experiences, such as among seniors living in institutions, and among those who are active and engaging in lifelong learning.

CONCLUSIONS AND PRACTICAL IMPLICATIONS

This research adds to the current body of knowledge on the use of the AAQ in cross-cultural settings. The Polish version of the AAQ has a similar structure to the original questionnaire, as described by Laidlaw et al. (2007). The AAQ-24-PL offers satisfactory psychometric properties, with good levels of reliability and validity. In particular, convergent and divergent validity data align with data from previous studies. The AAQ-24-PL is therefore a reliable, valid and time-stable tool for measuring attitudes towards aging. Researchers and practitioners working with older adults can benefit from using this tool to improve their understanding of aging and to measure outcomes of successful aging interventions to enhance the quality of life among older individuals.

Disclosure

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