

General population reference values for 3-level EQ-5D (EQ-5D-3L) questionnaire in Poland

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KEY WORDS

health-related quality of life, health state utility, normative values, patient-reported outcomes, population norms

ABSTRACT

INTRODUCTION A Polish EQ-5D normative study published in 2010 was conducted in 2008 as a pilot study. The group of respondents was relatively small and had limited representativeness.

OBJECTIVES The aim of the study was to derive population norms for the 3-level EQ-5D (EQ-5D-3L) questionnaire in Poland using a large, representative sample.

RESPONDENTS AND METHODS Stratified random sampling was used. A total of 3941 respondents (age, 18–87 years) completed the self-administered paper-based EQ-5D-3L questionnaire (3973 completed the visual analog scale, EQ VAS) and were included in this study. Utility index scores were derived using the Polish time trade-off value set.

RESULTS The study sample was representative of the general Polish population in terms of age, sex, geographical region, type and size of a given locality, level of education, and social and professional status. Mean EQ-5D-3L and visual analogue scale (EQ VAS) values decreased from 0.968 and 86.2 (age group, 18–24 years) to 0.730 and 54.0 (age group, ≥75 years), respectively. The most frequently reported complaints were pain/discomfort (45.8%) followed by anxiety/depression (33.3%), while the least commonly reported problem was self-care (9.4%).

CONCLUSIONS Polish population norms developed for the EQ-5D-3L index, descriptive part of the EQ-5D-3L, and EQ VAS can be used as reference values. The availability of such normative data should encourage the use of EQ-5D-3L in health-related quality-of-life studies in Poland.

INTRODUCTION In recent years, the assessment of health-related quality of life has become the standard endpoint of randomized clinical trials and an essential component of patient-centered care.^{1,2} The generic quality of life questionnaires, such as Short Form 36 (SF-36),^{3,4} WHOQOL-BREF,⁵ Nottingham Health Profile,⁶ or Sickness Impact Profile,⁷ can be used in populations that are diverse in terms of the diagnosed disease. The results obtained by using a generic questionnaire allow to perform comparisons with the average state of health of an age- and sex-matched population, a population from another country, or a population of patients suffering from another disease.

The 3-level EQ-5D (which has been renamed EQ-5D-3L after the introduction of a version with 5 responses per dimension, EQ-5D-5L) is one of the most popular generic instruments.⁸ Population norms for the EQ-5D-3L questionnaire

have been developed for more than 30 populations around the world, including the Polish population.^{9–12} These norms are successfully used in pharmacoeconomic analyses and other patient-reported outcome-based studies performed in Polish citizens.^{13–17}

The Polish normative study, published in 2010, was conducted as a pilot study.¹² It had 2 major limitations. First, it was based on a relatively small group of respondents ($n = 317$). Secondly, the sample was representative of the Polish population with regard to age and sex, but not other social and demographic variables, such as the level of education or place of residence.

The aim of the present study was to provide normative data for the EQ-5D-3L questionnaire in Poland, based on a large sample that was nationally representative in terms of age, sex, geographical region, educational level, and socioal and professional status.

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RESPONDENTS AND METHODS This study was conducted in cooperation with the Centre for Public Opinion Research (Centrum Badań Opinii Społecznej, CBOS) during the period from March to June 2014.

Sample Stratified sampling was used to obtain a representative sample of the adult Polish population. For each of the 16 provinces, particular localities were divided into 3 to 9 strata depending on the number of inhabitants (the largest number of strata was identified for the Mazovia and Silesia Provinces). Consequently, the population was divided into 65 strata based on the country's administrative division as well as the type and size of given localities in each province. Taking into account the trade-off between sample representativeness and cost of the study, we aimed at about 4000 respondents. Assuming a response rate of 38%, we decided to draw about 10 500 addresses. The predetermined sample size was divided into strata in proportion to the number of members of every 65 strata in the total population. Random sampling was carried out in several stages. First, cities and villages were sampled. Then, small areas (1 or several adjacent streets) within the previously drawn cities and villages were sampled (a minimum of 2 areas from each stratum) based on individual identification numbers (PESEL). Finally, a sample of 8 people, living at different addresses, was drawn from each of the randomly selected areas.

Interview procedure The interviews were conducted by qualified interviewers from CBOS. The interviewers were required to contact each randomly selected respondent at least 3 times to carry out an interview. No substitutes were permitted. Respondents received a set of quality-of-life questionnaires (namely EQ-5D-5L, EQ VAS, SF-12, and EQ-5D-3L, in a fixed order as described above) and answered questions about demographic characteristics and socioeconomic status. Quality-of-life questionnaires were administered as paper-and-pencil versions, and respondents had to fill them out on their own in the presence of an interviewer. Answers to general questions were collected by using the computer-aided personal interviewing system. A total of 10% of the interviews were subjected to quality control. This paper will present the results of the quality-of-life measurement with the EQ-5D-3L questionnaire.

EQ-5D-3L The EQ-5D-3L questionnaire consists of 2 parts: a descriptive system and visual analog scale (EQ VAS).⁸ The EQ-5D-3L descriptive system consists of 5 dimensions: mobility (MO), self-care (SC), usual activities (UA), pain/discomfort (PD), and anxiety/depression (AD). Respondents choose 1 of 3 levels of functioning ("no problems", "some problems", or "extreme problems") within each of the dimensions. The answers provided by each respondent can be presented as a 5-digit number describing the respondent's

health state (from "11111" meaning "no problems at all" to "33333" meaning "extreme problems" in all 5 dimensions). The system defines 243 possible states of health. Each state of health can be assigned a certain value (ie, an index or weight). In order to calculate EQ-5D-3L index values, we used a Polish EQ-5D-3L value set elicited directly by using the time trade-off method in another study.¹⁸ These index values illustrate societal preferences for different health states and range from -0.523 to 1.0, where negative values correspond to bad health states (states worse than death), and 1.0 corresponds to perfect health.

The EQ VAS is a typical, thermometer-like, visual analog scale that is used for the subjective assessment of people's health. This vertical scale is 20-cm long and is graded from 0 (representing "The worst health you can imagine") to 100 (representing "The best health you can imagine").

Socioeconomic status variables Questions about demographic characteristics and socioeconomic status covered: date of birth, sex, place of residence (the province as well as the type and size of a given locality), level of education, social and professional status, as well as the number of members of a given household, and respondent's income level.

Analysis The distribution of answers to the questions in the descriptive part of the EQ-5D-3L was estimated. Results were presented for the whole sample as well as for the predefined age groups (18–24, 25–34, 35–44, 45–54, 55–64, 65–74, and ≥75 years) in the EuroQol Group's standardized format to facilitate comparative research. We calculated the following descriptive statistics: the mean, standard deviation, the 25th, 50th, and 75th percentiles (ie, the first quartile, median, and third quartile) for both the EQ-5D-3L index and EQ VAS.

The statistical significance of differences between dichotomous variables (the presence or lack of health limitations) from 2 independent groups was estimated using the Fisher exact test. The differences between interval variables (EQ-5D-3L index or VAS scores) from 2 independent groups were verified using the normal distribution Z-test for 2 independent samples. The mean EQ-5D-3L index or VAS values in several age groups were compared with 1-way analysis of variance. Two-sided confidence intervals were used. A *P* value of less than 0.05 was considered statistically significant. The analysis was conducted using the statistical software, StatsDirect 2.7.8 (StatsDirect Ltd, Altrincham, England).

RESULTS Study population A total of 10 562 addresses were drawn and a total of 3978 interviews were conducted with adult Polish citizens (response rate, 37.7%). Those who responded differed from the drawn sample by no more than ±1.55% (ie, percentage of men in the drawn sample and in the interviewed group: 47.8% vs

TABLE 1 Characteristics of the study sample in comparison with general Polish adult population

		Full EQ-5D-3L sample (n = 3941)		Polish adult population ^a (n = 31 500 297)
sex	male	1846	46.8	47.7
	female	2095	53.2	52.3
mean age, y		48.3 ± 17.8		
age group, y				
18–24		456	11.6	10.6
25–34		613	15.6	19.4
35–44		647	16.4	17.9
45–54		610	15.5	15.1
55–64		794	20.1	17.7
65–74		523	13.3	10.2
≥75		298	7.6	9.0
region				
Lower Silesia Province		347	8.8	7.7
Kujawy-Pomerania Province		217	5.5	5.4
Lublin Province		197	5.0	5.6
Lubuskie Province		95	2.4	2.6
Łódź Province		275	7.0	6.7
Małopolska Province		362	9.2	8.6
Mazovia Province		488	12.4	13.8
Opole Province		97	2.5	2.7
Podkarpackie Province		225	5.7	5.4
Podlasie Province		130	3.3	3.1
Pomerania Province		203	5.2	5.8
Silesia Province		504	12.8	12.2
Świętokrzyskie Province		130	3.3	3.3
Warmia-Masuria Province		150	3.8	3.7
Wielkopolska Province		352	8.9	8.9
West Pomerania Province		169	4.3	4.5
place of residence				
country		1411	35.8	39.6
town, by number of inhabitants	up to 19 999	671	17.0	12.8
	20 000–49 999	466	11.8	11.0
	50 000–99 999	317	8.0	8.4
	100 000 and more	1076	27.3	28.2
educational level				
low		699	17.7	16.6
medium		2281	57.9	60.5
high		961	24.4	22.9
occupational status				
employed		1871	47.5	46.3
unemployed		259	6.6	5.6
retired		971	24.6	22.0
student		284	7.2	6.4
domestic		136	3.5	no data
other		420	10.7	no data

Data are presented as number, percentage, or mean ± standard deviation.

^a Central Statistical Office of Poland: Demographic Yearbook of Poland 2013 and Statistical Yearbook of Poland 2013

46.8%). Thirty-seven questionnaires (0.93%) were incomplete with regard to the EQ-5D-3L descriptive system (21 respondents refused to provide answers and 15 questionnaires were incomplete in terms of 1 dimension). Five respondents did not answer the EQ VAS questions. Finally, population norms for the EQ-5D-3L as well as EQ VAS were estimated based on 3941 and 3973 questionnaires, with complete answers, respectively. The characteristics of the study population are presented in **TABLE 1**. Respondents were aged from 18 to 87 years. The sample was similar to the Polish population in terms of age, sex, geographical region, type and size of a given locality, educational level, as well as social and professional status.

EQ-5D-3L dimensions **TABLES 2, 3, and 4** present the frequency of problems for particular EQ-5D-3L dimensions in different age groups for all respondents and separately for men and women. At least 1 moderate or severe health limitation was reported by 2083 respondents (52.9%) and 172 respondents (4.4%), respectively. Altogether, 2104 respondents (53.4%) had health limitations of any severity.

The distribution of responses was skewed for all of the dimensions (there were more of the “no problems” answers). The frequency of reported limitations increased with age, namely, for the subsequent age groups (**FIGURE 1**). Pain/discomfort was the most frequently reported problem (45.8%) followed by anxiety/depression (33.3%), while problems with self-care were reported the least frequently (9.4%).

In all dimensions, problems were more commonly reported by women than men; there was an absolute difference of 8.6% in the pain/discomfort dimension and 6.5% in anxiety/depression (both $P < 0.0001$), 5.0% in mobility and 4.3% in usual activities ($P < 0.001$, both), and 2.2% in the self-care dimension ($P = 0.022$).

EQ-5D-3L index Similar trends were observed for EQ-5D-3L index values (**TABLE 5**). EQ-5D-3L index scores significantly decreased with age ($F = 143.0$, $P < 0.0001$; **FIGURE 2**). In general, women were characterized by a lower index value ($P < 0.001$; Z-test for 2 independent samples). EQ-5D-3L index values were also significantly different in women than in men in the age groups of 18–24 ($P = 0.028$), 45–54 ($P = 0.039$), and ≥75 years ($P = 0.039$).

EQ VAS The subjective assessment of respondents’ health based on the EQ VAS for the whole study group and separately for men and women is presented in **TABLE 6**. In general, women reported poorer health than men ($P = 0.0001$). Nevertheless, as for age, significant differences between men and women were only observed in the age group of 65–74 years ($P = 0.036$). Self-rated health according to the VAS declined consistently with age ($F = 210.3$, $P < 0.0001$). The rate of this decline

TABLE 2 Problems in EQ-5D-3L dimensions reported by respondents in different age groups

EQ-5D-3L dimension	Level	Age, y							total
		18–24 n = 456	25–34 n = 613	35–44 n = 794	45–54 n = 794	55–64 n = 794	65–74 n = 523	≥75 n = 298	
mobility	no problems	96.3 (439)	94.8 (581)	93.4 (604)	83.3 (508)	66.6 (529)	53.2 (278)	29.2 (87)	76.8 (3026)
	some problems	3.7 (17)	5.2 (32)	6.6 (43)	15.9 (97)	32.9 (261)	44.7 (234)	68.8 (205)	22.6 (889)
	confined to bed	0.0 (0)	0.0 (0)	0.0 (0)	0.8 (5)	0.5 (4)	2.1 (11)	2.0 (6)	0.7 (26)
self-care	no problems	98.9 (451)	98.9 (606)	97.8 (633)	94.8 (578)	86.8 (689)	83.6 (437)	59.4 (177)	90.6 (3571)
	some problems	1.1 (5)	1.1 (7)	2.0 (13)	4.6 (28)	12.5 (99)	15.1 (79)	36.6 (109)	8.6 (340)
	unable to	0.0 (0)	0.0 (0)	0.2 (1)	0.7 (4)	0.8 (6)	1.3 (7)	4.0 (12)	0.8 (30)
usual activities	no problems	95.2 (434)	95.6 (586)	92.3 (597)	84.6 (516)	74.4 (591)	66.5 (348)	38.3 (114)	80.8 (3186)
	some problems	4.6 (21)	4.4 (27)	7.0 (45)	14.3 (87)	23.6 (187)	30.0 (157)	55.4 (165)	17.5 (689)
	unable to	0.2 (1)	0.0 (0)	0.8 (5)	1.1 (7)	2.0 (16)	3.4 (18)	6.4 (19)	1.7 (66)
pain/discomfort	no	84.9 (387)	79.1 (485)	68.9 (446)	52.8 (322)	39.2 (311)	27.2 (142)	14.4 (43)	54.2 (2136)
	moderate	14.9 (68)	20.6 (126)	30.6 (198)	45.4 (277)	57.6 (457)	67.3 (352)	75.2 (224)	43.2 (1702)
	extreme	0.2 (1)	0.3 (2)	0.5 (3)	1.8 (11)	3.3 (26)	5.5 (29)	10.4 (31)	2.6 (103)
anxiety/depression	no	84.4 (385)	82.9 (508)	76.5 (495)	64.1 (391)	57.4 (456)	52.6 (275)	39.6 (118)	66.7 (2628)
	moderate	14.9 (68)	16.6 (102)	23.2 (150)	34.3 (209)	40.9 (325)	44.2 (231)	57.4 (171)	31.9 (1256)
	extreme	0.7 (3)	0.5 (3)	0.3 (2)	1.6 (10)	1.6 (13)	3.3 (17)	3.0 (9)	1.5 (57)

Data are presented as percentage (number).

TABLE 3 Problems in EQ-5D-3L dimensions reported by male respondents in different age groups

EQ-5D-3L dimension	Level	Age, y							total
		18–24 n = 238	25–34 n = 309	35–44 n = 299	45–54 n = 294	55–64 n = 378	65–74 n = 228	≥75 n = 100	
mobility	no problems	97.1 (231)	94.5 (292)	94.6 (283)	84.7 (249)	65.3 (247)	58.3 (133)	32.0 (32)	79.5 (1467)
	some problems	2.9 (7)	5.5 (17)	5.4 (16)	15.0 (44)	33.9 (128)	38.6 (88)	67.0 (67)	19.9 (367)
	confined to bed	0.0 (0)	0.0 (0)	0.0 (0)	0.3 (1)	0.8 (3)	3.1 (7)	1.0 (1)	0.7 (12)
self-care	no problems	99.6 (237)	98.7 (305)	97.3 (291)	95.9 (282)	85.4 (323)	86.0 (196)	60.0 (60)	91.8 (1694)
	some problems	0.4 (1)	1.3 (4)	2.3 (7)	3.7 (11)	13.2 (50)	12.7 (29)	35.0 (35)	7.4 (137)
	unable to	0.0 (0)	0.0 (0)	0.3 (1)	0.3 (1)	1.3 (5)	1.3 (3)	5.0 (5)	0.8 (15)
usual activities	no problems	95.8 (228)	95.8 (296)	91.3 (273)	87.8 (258)	73.8 (279)	69.7 (159)	43.0 (43)	83.2 (1536)
	some problems	4.2 (10)	4.2 (13)	8.0 (24)	11.2 (33)	23.3 (88)	27.2 (62)	52.0 (52)	15.3 (282)
	unable to	0.0 (0)	0.0 (0)	0.7 (2)	1.0 (3)	2.9 (11)	3.1 (7)	5.0 (5)	1.5 (28)
pain/discomfort	no	88.2 (210)	83.5 (258)	71.9 (215)	56.1 (165)	39.2 (148)	33.3 (76)	14.0 (14)	58.8 (1086)
	moderate	11.8 (28)	15.9 (49)	27.4 (82)	42.9 (126)	56.6 (214)	61.8 (141)	82.0 (82)	39.1 (722)
	extreme	0.0 (0)	0.6 (2)	0.7 (2)	1.0 (3)	4.2 (16)	4.8 (11)	4.0 (4)	2.1 (38)
anxiety/depression	no	88.7 (211)	84.8 (262)	77.3 (231)	68.4 (201)	57.4 (217)	57.9 (132)	41.0 (41)	70.2 (1295)
	moderate	10.5 (25)	14.9 (46)	22.4 (67)	30.3 (89)	40.5 (153)	39.9 (91)	57.0 (57)	28.6 (528)
	extreme	0.8 (2)	0.3 (1)	0.3 (1)	1.4 (4)	2.1 (8)	2.2 (5)	2.0 (2)	1.2 (23)

Data are presented as percentage (number).

according to the EQ VAS was similar to the rate of decline in the 5D-3L index (FIGURE 2).

DISCUSSION We developed population norms for the EQ-5D-3L questionnaire (both for the index and the descriptive part) as well as for the EQ VAS, based on a large sample that was highly representative of the Polish population. These norms can be used as reference values for physicians, public health specialists, epidemiologists, health economists, as well as for health care decision makers.

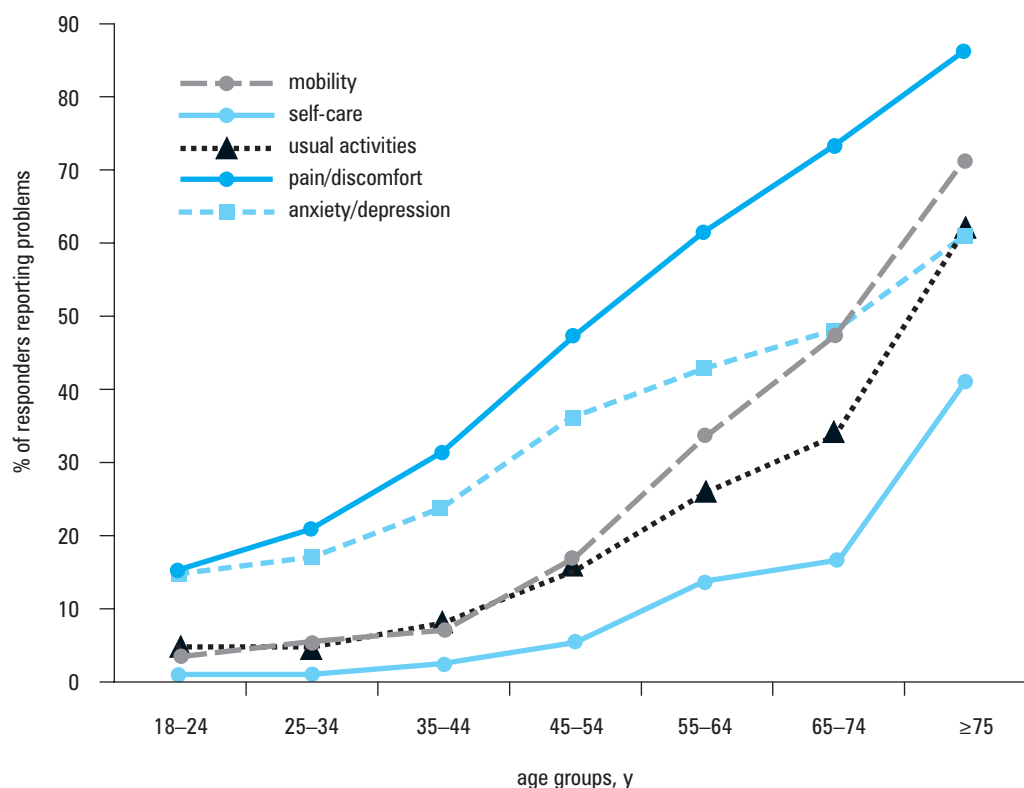
Our sampling design was the main strength of the present study. We obtained a sample representative of the Polish population in terms of age, sex, geographical region, type and size of a given locality, level of education, as well as social and professional status. The largest differences between the characteristics of the study group and the Polish population concerned the proportion of 1-person households.

The large size of the sample (nearly 4000 respondents) was another strength of our study. As a result, the hypothetical maximum estimation

TABLE 4 Problems in EQ-5D-3L dimensions reported by female respondents in different age groups

EQ-5D-3L dimension	Level	Age, y							
		18–24 n = 218	25–34 n = 304	35–44 n = 348	45–54 n = 316	55–64 n = 416	65–74 n = 295	≥75 n = 298	total n = 2095
mobility	no problems	95.4 (208)	95.1 (289)	92.2 (321)	82.0 (259)	68.3 (284)	49.2 (145)	27.8 (55)	74.5 (1561)
	some problems	4.6 (10)	4.9 (15)	7.8 (27)	18.8 (53)	31.5 (131)	49.5 (146)	69.7 (138)	24.8 (520)
	confined to bed	0.0 (0)	0.0 (0)	0.0 (0)	1.3 (4)	0.2 (1)	1.4 (4)	2.5 (5)	0.7 (14)
self-care	no problems	98.2 (214)	99.0 (301)	98.3 (342)	93.7 (296)	88.2 (367)	81.7 (241)	59.1 (117)	89.2 (1878)
	some problems	1.8 (4)	1.0 (3)	1.7 (6)	5.4 (17)	11.5 (48)	16.9 (50)	37.4 (74)	9.6 (202)
	unable to	0.0 (0)	0.0 (0)	0.0 (0)	1.0 (3)	0.2 (1)	1.4 (4)	3.5 (7)	0.7 (15)
usual activities	no problems	94.5 (206)	95.4 (290)	93.1 (324)	81.6 (258)	75.5 (314)	64.1 (189)	35.9 (71)	78.9 (1652)
	some problems	5.0 (11)	4.6 (14)	6.0 (21)	17.1 (54)	23.3 (97)	32.2 (95)	57.1 (113)	19.3 (405)
	unable to	0.5 (1)	0.0 (0)	0.9 (3)	1.3 (4)	1.2 (5)	3.7 (11)	7.1 (14)	1.8 (38)
pain/discomfort	no	81.2 (177)	74.7 (227)	66.4 (231)	49.7 (157)	39.7 (165)	22.4 (66)	14.6 (29)	50.2 (1052)
	moderate	18.3 (40)	25.3 (77)	33.3 (116)	47.8 (151)	58.4 (243)	71.5 (211)	71.2 (142)	46.8 (980)
	extreme	0.5 (1)	0.0 (0)	0.3 (1)	2.5 (8)	1.9 (8)	6.1 (18)	13.6 (27)	3.0 (63)
anxiety/depression	no	79.8 (174)	80.9 (246)	75.9 (264)	60.1 (190)	57.9 (241)	48.5 (143)	38.9 (77)	63.7 (1335)
	moderate	19.7 (43)	18.4 (56)	23.9 (83)	38.0 (120)	40.9 (170)	47.5 (140)	57.6 (114)	34.7 (726)
	extreme	9.5 (1)	0.7 (2)	0.3 (1)	1.9 (6)	1.2 (5)	4.1 (12)	3.5 (7)	1.6 (34)

Data are presented as percentage (number).

FIGURE 1 Rate of health limitations (any level of severity) for EQ-5D-3L dimensions in different age groups

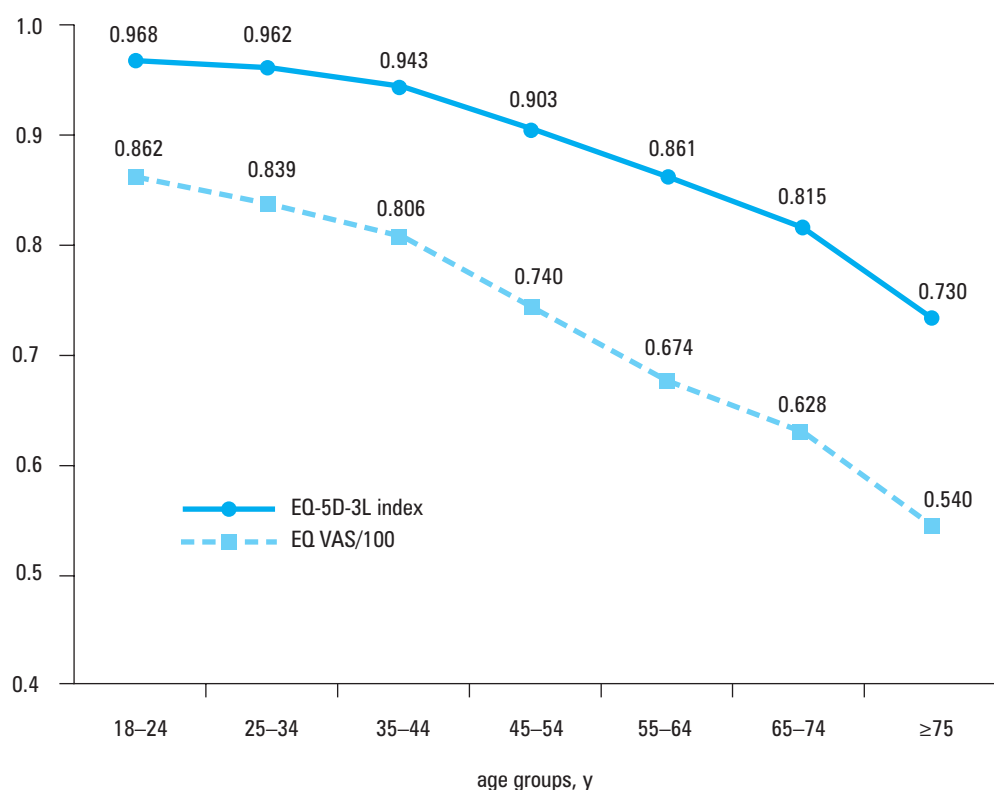
error can be as low as $\pm 1.55\%$. The size of the sample studied in Poland was above the median for studies on EQ-5D population norms ($n = 3552$) and was larger than the corresponding study samples in France, Germany,¹⁹ or the United Kingdom.²⁰ It was also significantly larger than the sample used in a Polish normative study for the SF-36v2 questionnaire ($n = 823$).²¹ Population norm studies differ significantly in their sample sizes because the size of such a study is always a trade-off between sample representativeness and

study sensitivity on one hand, and the burden of the study on the other. We find our sample size to represent a good balance between those 2 factors.

Finally, it is important that we used a paper-and-pencil questionnaire. The study would undoubtedly be less expensive and easier to conduct if the computer-aided personal interviewing system was employed at all stages of the research. We decided to use the paper-and-pencil questionnaire so that the method of developing population norms corresponded to the way in

TABLE 5 EQ-5D-3L index values based on Polish time trade-off value set, by age group and sex

EQ-5D-3L index value		Age, y							total
		18–24	25–34	35–44	45–54	55–64	65–74	≥75	
total	n	456	613	647	610	794	523	298	3941
	mean	0.968	0.962	0.943	0.903	0.861	0.815	0.730	0.893
	standard error	0.003	0.003	0.003	0.006	0.006	0.009	0.014	0.003
	25th percentile	1.000	0.925	0.894	0.868	0.816	0.770	0.716	0.848
	50th percentile	1.000	1.000	1.000	0.925	0.894	0.868	0.770	0.925
	75th percentile	1.000	1.000	1.000	1.000	1.000	0.899	0.868	1.000
men	n	238	309	299	294	378	228	100	1846
	mean	0.975	0.966	0.946	0.916	0.852	0.831	0.767	0.905
	standard error	0.004	0.004	0.005	0.007	0.010	0.014	0.019	0.004
	25th percentile	1.000	1.000	0.894	0.868	0.816	0.796	0.716	0.868
	50th percentile	1.000	1.000	1.000	0.925	0.872	0.868	0.783	1.000
	75th percentile	1.000	1.000	1.000	1.000	1.000	1.000	0.881	1.000
women	n	218	304	348	316	416	295	198	2095
	mean	0.960	0.958	0.942	0.891	0.870	0.802	0.712	0.883
	standard error	0.006	0.004	0.004	0.010	0.007	0.012	0.019	0.004
	25th percentile	0.925	0.894	0.894	0.868	0.816	0.770	0.716	0.842
	50th percentile	1.000	1.000	1.000	0.894	0.894	0.842	0.770	0.894
	75th percentile	1.000	1.000	1.000	1.000	1.000	0.894	0.853	1.000

FIGURE 2 EQ-5D-3L index and EQ VAS (divided by 100) in different age groups

which quality-of-life questionnaires are usually administered in Poland.

One of the limitations of the study is that respondents fulfilled quality-of-life questionnaires in a fixed order: starting with EQ-5D-5L, followed by EQ VAS and SF-12, and finally, EQ-5D-3L. Such an order might have affected the responses, especially for EQ-5D-3L, which was presented as the last one. The other effect was that respondents were more willing to fulfill a questionnaire that

was presented as the first rather than the last one (difference of 22 respondents; 0,55% of the studied population). A hypothetical solution to this problem would be to present quality-of-life questionnaires in a randomized order. Another limitation of the study is that in order to obtain a sample size of nearly 4000, we had to cooperate with over 70 interviewers. In quality-of-life studies, it is always better to use as little interviewers as possible to limit the resulting error.

TABLE 6 EQ VAS by age group and sex

EQ VAS		Age, y							total
		18–24	25–34	35–44	45–54	55–64	65–74	≥75	
total	n	458	619	654	613	799	525	305	3973
	mean	86.2	83.9	80.6	74.0	67.4	62.8	54.0	73.7
	standard error	0.6	0.6	0.6	0.7	0.7	0.9	1.1	0.3
	25th percentile	80	80	73	60	50	50	45	60
	50th percentile	90	90	80	80	70	60	50	80
	75th percentile	95	95	90	90	80	80	70	90
men	n	239	312	302	295	379	230	101	1858
	mean	87.1	84.7	81.2	74.4	66.4	64.8	55.0	75.0
	standard error	0.8	0.8	0.9	1.0	1.0	1.3	1.9	0.4
	25th percentile	80	80	75	60	50	50	50	60
	50th percentile	90	90	80	80	70	70	50	80
	75th percentile	95	95	90	90	80	80	70	90
women	n	219	307	352	318	420	295	204	2115
	mean	85.2	83.1	80.1	73.7	68.3	61.2	53.6	72.6
	standard error	1.0	1.0	0.8	1.1	0.9	1.2	1.3	0.4
	25th percentile	80	80	70	60	50	50	43.5	60
	50th percentile	90	90	85	80	70	60	50	80
	75th percentile	95	95	90	90	80	80	70	90

The results of the present study can be compared with the results of a pilot study of EQ-5D population norms that was carried out in Poland in 2008.¹² In 2014, as in 2008, problems were most often reported with regard to the pain/discomfort and anxiety/depression dimensions, but the differences between men and women were no longer so large. In general, objective health (EQ-5D-3L index) that was measured in consecutive age groups in 2014 was slightly better than that in 2008 (except for the age group of 55–64 years), while subjective, self-perceived health (EQ VAS) was systematically lower in 2014 than in 2008. However, in comparison with the previous pilot study,¹² the present study adds mainly the strengthening of validity and accuracy of population norms because the results are derived from a highly representative and significantly bigger sample.

The results of this study are to a certain extent also consistent with the results of the Polish normative study conducted for the SF-36v2 questionnaire.^{21,22} Age resulted in differences between responders for all of the EQ-5D-3L dimensions and only for 5 of 8 subscales of the SF-36v2 questionnaire (Physical Function, Role Physical, Role Emotional, General Health, and Bodily Pain). Female sex was associated with a higher pain/discomfort rate, as measured with EQ-5D-3L, in the age group of 18–34 years, and with a higher bodily pain rate, as measured with the SF-36 questionnaire, in the age group of 30–39 years.

The EQ-5D-3L population norms presented in the current study also make it possible to conduct cross-country comparisons. The comparative material is very extensive—over 30 sets of EQ-5D-3L national population norms have been

published to date. To ensure that the comparison is objective and comprehensive, we are planning to discuss this subject in more detail in another paper. Future studies of the general Polish population that will be conducted using the EQ-5D-3L may also focus on assessing health inequalities in various subpopulations (eg, urban vs. rural, residents of different provinces, etc).

In summary, Polish population norms that have been developed for the EQ-5D-3L index, descriptive part of the EQ-5D-3L and EQ VAS, can be used as reference values. The availability of such normative data should encourage the use of the EQ-5D-3L in health-related quality-of-life studies in Poland.

Contribution statement DG conceived the idea of the study. Both authors conducted the study and contributed to its design. DG analyzed the data. Both authors edited and approved the final version of the manuscript.

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Wartości referencyjne trzypoziomowej wersji kwestionariusza EQ-5D (EQ-5D-3L) dla populacji ogólnej w Polsce

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SŁOWA KLUCZOWE

jakość życia zależna od zdrowia, normy populacyjne, użyteczność stanu zdrowia, wartości normatywne, wyniki leczenia w ocenie pacjenta

STRESZCZENIE

WPROWADZENIE Polskie badanie norm populacyjnych EQ-5D opublikowane w 2010 roku zostało przeprowadzone w 2008 roku jako badanie pilotażowe. Badana próba respondentów była stosunkowo mała i charakteryzowała się ograniczoną reprezentatywnością.

CELE Celem badania było opracowanie norm populacyjnych dla kwestionariusza EQ-5D-3L w Polsce w oparciu o dużą reprezentatywną próbę.

RESPONDENCI I METODY Zastosowano losowanie warstwowe badanej próby. 3941 respondentów (wiek 18–87 lat) wypełniło samodzielnie papierową wersję kwestionariusza EQ-5D-3L (3973 wypełniło wizualną skalę analogową EQ VAS) i zostało włączonych do badania. Wartości indeksu użyteczności zostały obliczone za pomocą polskiego zestawu wartości opartego na metodzie handlowania czasem.

WYNIKI Próba badana była reprezentatywna dla populacji ogólnej Polski pod względem wieku, płci, lokalizacji geograficznej, typu i wielkości miejsca zamieszkania, poziomu wykształcenia oraz grupy społeczno-zawodowej. Średnie wartości indeksu EQ-5D-3L oraz wizualnej skali analogowej EQ VAS zmniejszały się odpowiednio z 0,968 i 86,2 (w grupie wiekowej 18–24 lat) do 0,730 i 54,0 (w grupie > 75 lat). Najczęściej zgłaszane problemy dotyczyły bólu/dyskomfortu (45,8%) i niepokoju/depresji (33,3%), a problemy zgłaszane najrzadziej – samodzielnego funkcjonowania (9,4%).

WNIOSKI Opracowanych polskich norm populacyjnych dla indeksu EQ-5D-3L, części opisowej EQ-5D-3L oraz EQ VAS można używać jako wartości referencyjnych. Dostępność danych normatywnych powinna się przyczynić do częstszego stosowania EQ-5D-3L w badaniach jakości życia zależnej od zdrowia w Polsce.

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