



Оригинальное исследование | Original study article
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Dependence in instrumental activities of daily living and its associations with other geriatric syndromes in people over 65 years of age: data from the Russian epidemiological study EUCALYPT

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Abstract

Aim – to assess the frequency of disability in instrumental activities of daily living (IADLs) and to analyze its associations with other geriatric syndromes in persons aged ≥ 65 years.

Material and methods. The study involved 4,308 people (30% male) living in 11 regions of the Russian Federation, aged 65 to 107 years (average age 78 ± 8 years). The majority (60%) of participants were examined in a polyclinic, every fifth – in a hospital (20%) or at home (19%), 1% – in nursing homes. All patients underwent a comprehensive geriatric assessment, including an assessment of instrumental activities of daily living on the Lawton scale.

Results. Among the elderly, a high (54%) prevalence of dependence in IADLs was revealed, and with increasing age, this indicator increased significantly, reaching 82% in people over 85 years old. In patients with disability in IADLs, the frequency of all geriatric syndromes, except orthostatic hypotension, was higher, of which the most common were chronic pain syndrome (90%), frailty (80%), dependence in basic activities of daily living (ADLs) (78%), cognitive impairment (75%), probable depression (63%) and urinary incontinence (54%). One-factor regression analysis showed that the presence of disability in IADLs increases the chances of detecting other geriatric syndromes by 1.6–5.9 times.

Conclusion. The results of the EUCALYPT epidemiological study demonstrate a high prevalence of dependence in IADLs among the Russian population. The study also gives an idea of the relationship of dependence in IADLs with various geriatric syndromes.

Keywords: instrumental activities of daily living, frailty, geriatric syndromes, older adults, dependence in basic activities of daily living, geriatric assessment.

Conflict of interest: nothing to disclose.

Citation

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Инструментальная зависимость в повседневной жизни и ее ассоциации с другими гериатрическими синдромами у лиц старше 65 лет: данные российского эпидемиологического исследования ЭВКАЛИПТ

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Аннотация

Цель – оценить частоту инструментальной зависимости в повседневной жизни и проанализировать ее ассоциации с другими гериатрическими синдромами у лиц в возрасте ≥ 65 лет.

Материал и методы. В исследовании принимали участие 4 308 человек (30% мужчин), проживающие в 11 регионах РФ, в возрасте от 65 до 107 лет (средний возраст 78 ± 8 лет). Большинство (60%) участников были обследованы в условиях поликлиники, каждый пятый – в стационаре (20%) или на дому (19%), 1% – в интернатах/домах престарелых. Всем пациентам выполнили комплексную гериатрическую оценку, включая оценку инструментальной повседневной активности по шкале Лоутон.

Результаты. Среди пожилых людей выявлена высокая (54%) распространенность инструментальной зависимости в повседневной жизни, и с увеличением возраста этот показатель значительно возрастает, достигая 82% у лиц старше 85 лет. У пациентов с инструментальной зависимостью в повседневной жизни оказалась выше частота всех гериатрических синдромов (за исключением ортостатической гипотензии), из которых самыми распространенными были хронический болевой синдром (90%), синдром старческой астении (80%), базовая зависимость в повседневной жизни (78%), когнитивные нарушения (75%), вероятная депрессия (63%) и недержание мочи (54%). Однофакторный регрессионный анализ показал, что наличие инструментальной повседневной зависимости повышает шансы выявления других гериатрических синдромов в 1,6–5,9 раза.

Выводы. Результаты эпидемиологического исследования ЭВКАЛИПТ демонстрируют высокую распространенность зависимости в инструментальной повседневной активности среди российской популяции. Также исследование дает представление о взаимосвязи инструментальной зависимости с различными гериатрическими синдромами.

Ключевые слова: инструментальная зависимость, старческая астения, гериатрические синдромы, пожилой пациент, базовая зависимость в повседневной жизни, комплексная гериатрическая оценка.

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BACKGROUND

According to Rosstat for 2022, the Russian Federation has a population of 145.1 million people, with 24% of them being over working age. The proportion of the older population is currently growing steadily; however, the most significant aspect is not a person's age but his/her quality of life. In this regard, the assessment of this category of patients becomes a concern. One of the main indices is the Lawton scale used when conducting a comprehensive geriatric assessment (CGA), which enables the assessment of the patient's dependence in everyday life, instrumental activity (instrumental activities of daily living [IADLs]) [1]. This indicator is recommended for Russian geriatricians when conducting CGA [2, 3].

Living independently and the ability to meet daily needs without external assistance demonstrate independence in everyday life. Dependence on external assistance is a more important predictor of mortality and, in assessing the prognosis of life and health of an older person, is of greater importance than diseases themselves [4]. Dependence in IADLs is commonly used as an indicator of disability and functional impairment among older people [5]. These functional limitations are associated with a lower quality of life [6, 7] and an increased need for healthcare services and associated costs [8].

To date, in Russia, no data are available on the prevalence of dependence in IADLs in older patients with senility and on the influence of various geriatric syndromes (GSs) on the implementation of instrumental

activities. From 2018 to 2020, a large epidemiological study (Epidemiological study of the prevalence of GSs and age-associated diseases in older people in regions of the Russian Federation with different climatic, economic, and demographic characteristics) was conducted. This study was conducted to obtain Russian data on the prevalence of GSs and age-associated and chronic noncommunicable diseases in the 65-year-old population. In the EUCALYPT study, the prevalence of 15 GSs was analyzed, one of which is dependence in IADLs; the results of some others were described in our previous articles [9–11].

AIM

This study aimed to assess the incidence of dependence in IADLs and analyze its association with other GSs in persons aged ≥ 65 years.

MATERIAL AND METHODS

The EUCALYPT study enrolled individuals aged >65 years from 11 regions of the Russian Federation, who gave written voluntary informed consent to participate in the study.

The study participants underwent a CGA, which included two stages: 1) answering questions on a questionnaire developed specifically for the study and 2) physical examination and evaluation. Both stages were performed simultaneously by geriatricians and

geriatric nurses at the patient's location or residence (in a hospital, clinic, nursing homes, or at home).

The physical examination included 1) the Short Physical Performance Battery (SPPB), 2) hand dynamometry, 3) walking speed, 4) Mini-Cog test, 5) assessment of height, weight, and body mass index (BMI), 6) measurement of blood pressure and heart rate, and 7) orthostatic test.

All tests, scales, and questionnaires (except for the Charlson comorbidity index) used in the study were taken from the Russian clinical guidelines "Frailty syndrome" [2, 3]. More detailed information on the study protocol and participant characteristics has been described in our previous article [12].

The Lawton scale was used to assess dependence in IADLs. The scale consists of eight questions, namely, the ability to use the telephone independently, take medications, manage one's finances, cook food, go to the grocery store, do housework, wash clothes, and get to places outside the usual walking distance. The maximum score is 8 (normal), and the minimum is 0. A score of ≤ 7 indicates a decrease in IADLs.

In addition to dependence in IADLs, GSs were identified, including frailty syndrome, depression, malnutrition, orthostatic hypotension, urinary incontinence, fecal incontinence, cognitive impairment, basic dependence in everyday life, falls (over the previous year), visual impairment, hearing deficit, sensory deficit (any), chronic pain syndrome, and bedsores.

Characteristics of the participants The study included 4,308 (30% men) patients aged 65–107 years (mean age 78 ± 8 years). The majority (60%) of the participants were examined in a polyclinic, every fifth patient was examined in a hospital (20%) or at home (19%), and 1% of the patients were examined in nursing homes.

Statistical data analysis was performed using the IBM® SPSS® Statistics version 23.0 (IBM Corp., Armonk, NY, USA). To assess the compliance of quantitative variables with the normal distribution (Gaussian distribution), the one-sample Kolmogorov–Smirnov normality test was used. In the case of a

normal distribution, data were displayed as the mean \pm standard deviation ($M \pm SD$) and as Me (25%; 75%) for those with a nonnormal distribution, where Me is the median, 25% and 75% are the 25th and 75th percentiles, respectively. Qualitative ordinal variables are presented as Me (25%; 75%). For clarity, in some cases (with the same median values), qualitative ordinal variables were presented as both Me (25%; 75%) and $M \pm SD$. Missing values were not compensated. In the intergroup comparisons, the Mann–Whitney U test, Kruskal–Wallis H test, Pearson's chi-squared test, and two-sided Fisher's exact test were used. Relationships between variables were assessed using Spearman's correlation analysis and binary logistic regression, calculating odds ratios (OR) and 95% confidence intervals (CI). Multivariate analyses were performed after adjusting for age and sex. Direct stepwise selection of variables was used, and missing values were removed row by row. Differences with a two-sided p-value < 0.05 were considered statistically significant.

RESULTS

Dependence in instrumental functional activity was determined in all participants. The Lawton score ranged from 0 to 8 (median 7; interquartile range, 5–8) points. The distribution of participants depending on the scores is presented in **Figure 1**.

Slightly less than half (46%) of the respondents did not have dependence in IADLs; the remaining 54% showed dependence in IADLs. The prevalence of dependence in IADLs increased significantly with increasing age (**Fig. 2**).

Analysis of the components of the Lawton scale (**Table 1**) revealed that the respondents most often required external assistance when preparing food (39%) and shopping (46%) and least often when using the telephone (4.6%).

Patients with dependence in IADLs were on average 7 years older than those without dependence (81.4 ± 8.2 vs. 74.6 ± 7.0 years; $p < 0.001$). There were significantly more men among them (33% versus 25.8%; $p < 0.001$). According to the univariate regression analysis, every 1-year increase in age is associated with an increase in the odds of dependence in IADLs by 12% (OR 1.12; 95% CI 1.11–1.13; $p < 0.001$), and in men, the odds were higher by 41% (OR 1.41; 95% CI 1.24–1.62; $p < 0.001$).

According to the CGA results, the geriatric status of patients with dependence in IADLs was naturally worse than that of patients without dependence. They also had a decrease in walking speed, dynamometry results, sum of scores on the Barthel index and Mini-Cog test, on the Mini Nutritional Assessment Scale (MNA), and SPPB, and the scores on the GDS-15 and the screening scale "age is not a problem" were higher. Patients with dependence in IADLs rated their quality of life and health status lower and the intensity of pain syndrome as higher at the time of examination and over the previous 7 days (**Table 2**).

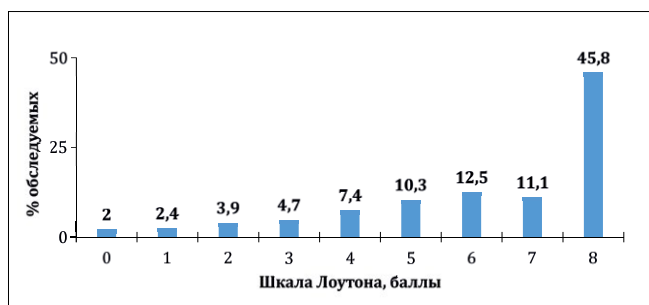


Figure 1. Distribution of persons aged ≥ 65 years, depending on the Lawton scale score ($n=4308$).

Рисунок 1. Распределение лиц в возрасте ≥ 65 лет в зависимости от суммы набранных баллов по шкале Лоутона ($n=4308$).

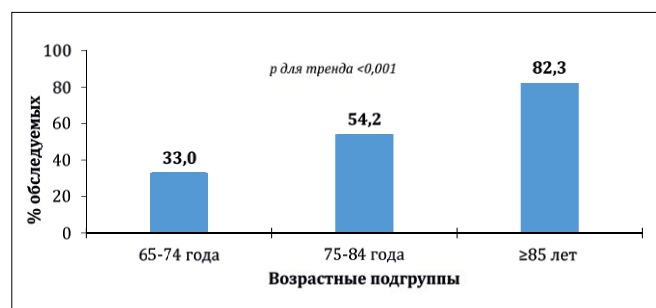


Figure 2. Prevalence of disability in instrumental activities of daily living in persons aged ≥ 65 years, depending on the age subgroup ($n=4308$).

Рисунок 2. Распространенность инструментальной зависимости в повседневной жизни у лиц в возрасте ≥ 65 лет в зависимости от возрастной подгруппы ($n=4308$).

Lawton scale components	% of participants in need of assistance
Telephone calls	4,6
Financial transactions	8,3
Housekeeping	9,0
Taking medications	18,4
Washing clothes	23,7
Use of transport	27,6
Cooking	38,5
Shopping	46,1

Table 1. Proportion of persons in need of assistance when performing the components of the Lawton scale ($n=4308$)

Таблица 1. Доля обследуемых, нуждающихся в посторонней помощи при выполнении компонентов шкалы Лоутона ($n=4308$)

Patients with dependence in IADLs, in general, more often used auxiliary aids (93.5% versus 91.4%; $p = 0.010$), and their number per patient was significantly greater than that in patients without dependence [2 (2; 3) versus 2 (1; 3) or 2.6 ± 1.5 versus 1.9 ± 1.2 ; $p < 0.001$]. Patients with dependence in IADLs more often used hearing aids (10.2% vs. 3.8%; $p < 0.001$), artificial

dentures (62.4% vs. 56.5%; $p < 0.001$), mobility aids (53.8% vs. 15%; $p < 0.001$), and adult diapers (21.4% vs. 11.9%; $p < 0.001$) but less often used glasses/lenses (77.4% vs. 81.6%; $p < 0.001$) and orthopedic insoles (8.5% vs. 12.2%; $p < 0.001$).

The correlation analysis revealed predominantly moderate direct and inverse relationships between the sum of scores on the Lawton scale and other CGA indicators (**Table 3**). A weak positive correlation was noted between the Lawton scale score and walking speed, and weak negative correlations were found between the Lawton scale score and self-assessed pain intensity at the time of the examination and over the previous week. The closest relationship was revealed between the total score on the Lawton scale and the Barthel index.

Patients with dependence in IADLs had a higher incidence of all GSs (**Table 4**), except for orthostatic hypotension. The most common GSs were chronic pain syndrome (90%), frailty syndrome (80%), basic dependence in ADLs (78%), cognitive impairment (75%), probable depression (63%), and urinary incontinence (54%).

Univariate regression analyses with GSs as the dependent variable and dependence in IADLs as the independent variable examined the relationships between dependence in IADLs and other GSs (**Table 5**). Univariate analysis showed that dependence in IADLs increased the odds of identifying other GSs by 1.6–5.9 times.

Univariate analysis revealed the strongest associations between dependence in IADLs and visual impairment (OR 5.86), whereas patients with dependence used glasses/lenses significantly less often. Thus, among patients with dependence in IADLs and visual impairment ($n = 188$), the frequency of using glasses was 1.8 times lower than that in “dependent” patients without visual impairment ($n = 2149$) (43.6% versus 80.4%; $p < 0.001$). Univariate regression analysis showed that the use of glasses reduced the odds of dependence in IADLs

Indicator	All patients ($n = 4308$)	Dependence in instrumental activities of daily living		p
		Yes ($n = 2337$)	No ($n = 1971$)	
“Age is not a problem” scale, score*	3 (1; 4)	3 (2; 5)	2 (1; 3)	<0,001
Short Physical Performance Battery, score*	6 (3; 9)	4 (1; 7)	8 (6; 10)	<0,001
Dynamometry, kg*	men	22 (16; 30)	19 (13; 26)	<0,001
	women	16 (11; 21)	13 (9; 18)	<0,001
Reduction in hand grip strength, %	70,8	82,1	58,0	<0,001
Walking pace, m/s*	0,60 (0,46; 0,83)	0,55 (0,41; 0,80)	0,67 (0,50; 0,83)	<0,001
Decrease in walking pace, %	56,1	63,6	48,8	<0,001
Mini-Cog test, score*	3 (2; 4)	2 (1; 4)	4 (3; 4)	<0,001
Barthel index, score*	95 (85; 100)	90 (75; 95)	100 (95; 100)	<0,001
Mini Nutritional Assessment Scale (MNA (screening part), score*	12 (10; 13)	11 (10; 13)	13 (11; 14)	<0,001
Geriatric Depression Scale GDS-15, score*	4 (2; 8)	6 (3; 9)	3 (1; 5)	<0,001
Self-assessment of quality of life according to the VAS score*	7 (5; 8)	6 (5; 7)	7 (6; 8)	<0,001
Self-assessment of health according to the VAS score*	5 (5; 7)	5 (4; 6)	6 (5; 7)	<0,001
Self-rated pain according to the VAS score at the time of examination, score*	3 (0; 5)	4 (0; 5)	2 (0; 5)	<0,001
Self-rated pain according to VAS over the previous week, score*	4 (2; 6)	5 (3; 7)	4 (1; 5)	<0,001

* results are presented as Me (25%; 75%)

Table 2. The results of CGA in persons aged ≥ 65 years, depending on the presence or absence of disability in instrumental activities of daily living ($n=4308$)

Таблица 2. Результаты КГО у лиц в возрасте ≥ 65 лет в зависимости от наличия или отсутствия инструментальной зависимости в повседневной жизни ($n=4308$)

Indicator	n	r	p
Walking pace	3863	0,24	<0,001
Dynamometry	3692	0,39	<0,001
SPPB total score	4308	0,57	<0,001
Total score in "age is not a problem"	4308	-0,44	<0,001
Total score in the Mini-Cog test	3545	0,44	<0,001
Total score on the GDS-15 scale	4284	-0,45	<0,001
Barthel index	4308	0,63	<0,001
Score on the MNA scale	4308	0,43	<0,001
Self-assessment of quality of life according to the VAS	4043	0,34	<0,001
Self-assessment of health according to the VAS	4035	0,36	<0,001
Self-rated pain according to the VAS at the time of examination	4098	-0,23	<0,001
Self-rated pain according to VAS over the previous 7 days	4075	-0,18	<0,001
Number of aids used	4308	-0,27	<0,001

Table 3. Correlations between the scores on the Lawton scale and the CGA score in persons aged ≥65 years

Таблица 3. Корреляции между суммой баллов по шкале Ловтона и показателями КГО у лиц в возрасте ≥65 лет

by 80% (OR 0.20; 95% CI 0.08–0.52; $p = 0.001$), specifically in patients with visual impairment ($n = 217$), and by 23% (OR 0.77; 95% CI 0.66–0.90; $p = 0.001$) in all participants ($n = 4308$), regardless of the presence or absence of visual impairment. Thus, these findings indicate the importance of correcting visual impairment to prevent dependence in IADLs.

Moreover, 13 GSs were included in the multivariate regression analysis (adjusted for age and sex) with a significance level of $p < 0.05$ based on the results of univariate analysis. Multivariate analysis demonstrated that, along with age and male sex, 10 were independently associated with dependence in IADLs (Table 6).

Thus, with an increase in age every year, the chances of identifying dependence in IADLs increase by 8%; in men, the chances are 2.6 times higher, and the presence of GSs (except urinary incontinence) is associated with an increase in the probability of detecting dependence in IADLs by 1.3–5.1 times.

Interestingly, according to multivariate analysis, urinary incontinence was an independent predictor of dependence in IADLs (OR = 0.43), which corresponds to a 57% reduction in the probability of dependence in IADLs with urinary incontinence. However, in the univariate analysis, the OR for urinary incontinence was 2.18 (Table 6); the same association persisted when adjusting for age and sex in the analysis (OR 1.82; 95% CI 1.58–2.09; $p < 0.001$). The results obtained are attributed to variables having a mutual influence on each other in a multifactorial model; accordingly, their contribution to the overall effect, which is not the same for each of them, will also depend on this interaction; that is, urinary incontinence can be a protective factor only when combined with all other GSs, which are independent predictors of dependence in IADLs in this model.

DISCUSSION

For the first time in Russia, the EUCALYPT study examined the prevalence and characteristics of IADLs in the geriatric population. Among older people, a high (54%) prevalence of

Indicator, %	Dependence in instrumental activities of daily living		p
	Yes (n=2337)	No (n=1971)	
Chronic pain syndrome	89,6	84,3	<0,001
Frailty syndrome	80,3	41,8	<0,001
Basic dependences in everyday life	78,1	41,2	<0,001
Cognitive impairment	74,9	44,6	<0,001
Possible depression	63,3	30,1	<0,001
Urinary incontinence	54,0	35,1	<0,001
Falls over the previous year	35,6	24,2	<0,001
Sensory deficit (any)	22,4	7,1	<0,001
Hearing deficit	16,8	5,9	<0,001
Malnutrition	9,4	1,8	<0,001
Visual impairment	8,0	1,5	<0,001
Orthostatic hypotension	12,5	12,5	0,951
Fecal incontinence	7,0	2,5	<0,001
Bedsore	3,6	0,7	<0,001

Table 4. Frequency of geriatric syndromes in persons aged ≥65 years, depending on the presence or absence of disability in instrumental activities of daily living ($n=4308$)

Таблица 4. Частота гериатрических синдромов у лиц в возрасте ≥65 лет в зависимости от наличия или отсутствия инструментальной зависимости в повседневной жизни ($n=4308$)

dependence in IADLs was revealed, and this figure increased significantly with increasing age, reaching 82% in people aged >85 years.

International studies have revealed a lower prevalence of decreased dependence in IADLs. Thus, in a Spanish study involving more than 25 thousands older people, the prevalence of decreased IADLs reached 31.9% [13]. In a national Brazilian study of 10,537 patients aged >60 years, the decline in dependence in IADLs was 14% [14]. A Korean study examined the incidence of ADL/IADL limitations in a nationally representative sample of community-dwelling

Factors	n	OR	CI 95%	P
Chronic pain syndrome	4308	1,61	1,34–1,93	<0,001
Falls over the previous year	4301	1,74	1,52–1,99	<0,001
Urinary incontinence	4308	2,18	1,92–2,46	<0,001
Fecal incontinence	4308	2,94	2,13–4,07	<0,001
Hearing deficit	4305	3,23	2,60–4,01	<0,001
Cognitive impairment	3545	3,71	3,22–4,28	<0,001
Sensory deficit (any)	4307	3,77	3,09–4,59	<0,001
Possible depression	4284	3,99	3,51–4,54	<0,001
Basic dependences in everyday life	4308	5,09	4,46–5,81	<0,001
Bedsore	4295	5,15	2,91–9,10	<0,001
Frailty syndrome	4308	5,67	4,95–6,49	<0,001
Malnutrition	4308	5,75	4,00–8,26	<0,001
Visual impairment	4307	5,86	3,94–8,70	<0,001

Note: The dependent variable is geriatric syndromes.

Table 5. Associations between disability in instrumental activities of daily living and other geriatric syndromes in persons aged ≥65 years (one-factor regression analysis)

Таблица 5. Ассоциации между инструментальной зависимостью в повседневной жизни и другими гериатрическими синдромами у лиц в возрасте ≥65 лет (однофакторный регрессионный анализ)

Predictors	OR	95% CI	P
Urinary incontinence	0,43	0,33–0,57	<0,001
Age (for every 1 year)	1,08	1,07–1,09	<0,001
Falls over the previous year	1,30	1,08–1,56	0,006
Sensory deficit (any)	1,45	1,08–1,94	0,015
Cognitive impairment	1,56	1,31–1,86	<0,001
Malnutrition	1,77	1,11–2,85	0,017
Visual impairment	1,88	1,05–3,36	0,034
Possible depression	2,11	1,77–2,51	<0,001
Male gender	2,60	2,12–3,18	<0,001
Frailty syndrome	3,00	2,51–3,59	<0,001
Bedsore	3,05	1,43–6,48	0,004
Basic dependences in everyday life	5,10	3,86–6,75	<0,001

Note: The dependent variable is dependence in instrumental activities of daily living.

Table 6. Associations between disability in instrumental activities of daily living and other geriatric syndromes in persons aged ≥ 65 years (multivariate regression analysis adjusted for age and gender) ($n=3516$)

Таблица 6. Ассоциации между инструментальной зависимостью в повседневной жизни и другими гериатрическими синдромами у лиц в возрасте ≥ 65 лет (многофакторный регрессионный анализ с поправкой на возраст и пол) ($n=3516$)

Korean adults aged ≥ 65 years. The decrease in dependence in IADLs according to the study was 10.1%. This value increased in the group with poor self-assessed health and with an increasing age of the patients under follow-up [15]. In a metaanalysis conducted in a joint work of American and Spanish scientists, older people who studied at home and later in medical centers (aged >60 years in the USA and >65 years in Spain) were assessed for the presence of frailty, impaired mobility, and dependence in IADLs. The latter figure was 12.5% [16]. Thus, the prevalence of dependence in IADLs among older patients varies across countries; however, in all cases, it is lower than that in our study. These discrepancies may be due to socioeconomic and cultural differences.

Our study demonstrated the relationship between dependence in IADLs and the results of a CGA. Specifically, a correlation was revealed between low Lawton scale scores and walking speed, the results of carpal dynamometry, Barthel index, Mini-Cog test, MNA, and SPPB tests, and the sum of scores on the GDS-15 and the "Age is not a problem" questionnaire. Patients with dependence in IADLs rated their quality of life and health status lower and the intensity of pain syndrome higher. Patients with dependence in IADLs had a higher incidence of all GSs, except orthostatic hypotension. The most common GSs were chronic pain syndrome (90%), frailty syndrome (80%), basic dependence in ADLs (78%), cognitive impairment (75%), probable depression (63%), and urinary incontinence (54%).

In the multivariate analysis adjusted for sex and age, the presence of GSs was associated with increased odds of identifying dependence in IADLs. Frailty syndrome, probable depression, falls, cognitive impairment, chronic pain syndrome, hearing deficit, and bedsores had a significant effect. This suggests a close relationship between GSs and IADL dependence. Similar results have been obtained in many international studies.

A metaanalysis by Gotaro Kojima et al., including 20 scientific studies, quantitatively demonstrated that frailty syndrome is an important predictor of the onset and worsening of dependence in IADLs [17].

A longitudinal population-based cohort of 6,678 older adults initially without a disability was interviewed at 3-year intervals from 1993 to 2012. The study assessed cognitive function and physical status when performing ADL and IADL. The severity of ADL and IADL dependence is associated with faster cognitive decline [18].

Evidence supporting the relationship between IADLs and malnutrition is inconsistent. A systematic review showed inconclusive evidence to determine an association with malnutrition [19]. This is contrary to other studies that suggest that deterioration in health and/or functional status makes food preparation and grocery shopping more difficult, which negatively affects nutritional status [20].

The relationship between dependence in IADLs and psychoemotional status, quality of life, depressive states [21], sarcopenia [22], and hearing loss [23] has also been demonstrated in some studies.

A limitation of this study was the fact that patients were examined once; therefore, it is impractical to draw unambiguously a conclusion about cause-and-effect relationships. Further prospective follow-up must identify these patterns.

In general, our data coincide with those of the world literature, revealing relationships between IADLs and many GSs and with frailty syndrome.

CONCLUSION

Thus, the results of the epidemiological EUCALYPT study demonstrate a high prevalence of dependence in IADLs among the Russian population. In addition to the prevalence of dependence in IADLs, the study also provides insight into the relationship between dependence in IADLs and various GSs. This further confirms the importance of determining IADLs in CGA and provides directions for further practical research. ■

Conflict of interest. The authors declare no conflict of interest.

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