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Indicative of depressive symptoms among older people: a longitudinal study

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ABSTRACT

Introduction: Depressive symptoms can affect the quality of life of older people. Therefore, changes in this condition must be monitored. **Objective:** To analyze the prevalence of changes in the indicative of depressive symptoms among older people and their associated factors. **Methods:** Longitudinal study was carried out for two years with 387 older people from a municipality in Triângulo Mineiro, Brazil. Data were collected at home using Mini-Mental State Examination; a structured questionnaire prepared by the Collective Health Research Group; Lawton and Brody scale; and a short Geriatric Depression Scale. Descriptive analysis and multinomial logistic regression were performed ($p<0.05$). **Results:** After the two-year follow-up, there was a decrease in the prevalence of older people with indicative depressive symptoms (24.3%). In addition, 20.2% of the older people have no indication of depressive symptoms; 63.0% maintained their initial condition and 16.8% were new cases. Positive self-rated health ($p=0.003$), functional independence for instrumental activities of daily living ($p=0.025$), and the lower number of morbidities ($p=0.002$) were predictors of improvement in indicative of depressive symptoms; while the increase in the number of morbidities ($p=0.002$) was a predictor for the presence of this condition. **Conclusion:** The occurrence of indicative depressive symptoms among older people decreased during the follow-up and the improvement of this condition was associated with positive self-rated health, functional independence for instrumental activities of daily living, and with a lower number of morbidities. Such factors should be considered when planning health actions aimed at preventing depressive symptoms in older people.

Keywords: aged; health of the older people; depression; longitudinal studies; geriatric nursing.

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INTRODUCTION

Chronic diseases are the main causes of mortality and functional disabilities worldwide, with a negative impact on the aging process[1]. For the older people population, in particular, mental illnesses, such as depression, occupy the fifth position in the total burden of morbidity and mortality[1].

A meta-analysis verified an estimated prevalence of depressive symptoms in the Brazilian older people population of 21%, with the lowest percentage in the South of the country (7.1%) and the highest in the Northeast region (39.6%)[2]. In a longitudinal

study with a six-year follow-up among older people, and residents in São Paulo, Brazil, the incidence of indicative depressive symptoms was 7.7%[3]. In a two-year follow-up study, the percentage of new cases of this condition was 18.7% in Albania, 8.1% in Latin America, and 5.5% in Canada[4]. However, among older people, depressive symptomatology is still underdiagnosed and often taken as a natural manifestation, consequent to the human aging process and/or secondary to other pre-existing morbidities[5].

The main factors associated with the presence of indicative depressive symptoms among older people are female gender[3,5,6], living without a partner[5-11], low socioeconomic and educational level[6,7,12], absence of religion[5], negative self-assessment of health, polymorbidity[3,5,12,13], dependence for the instrumental activities of daily living (IADL)[3,7,9,10,14] and cognitive deficit[9,11,15].

In the older people population, the presence of indicative depressive symptoms can affect the quality of life[5,9,16], health conditions, physical and mental performance, affectivity, independence, and autonomy, besides increasing the risk of suicide[5,9]. Therefore, possible changes in this condition over the years should be monitored. Moreover, the identification of its predictor variables helps health professionals in the development of early interventions and the direction of care for health promotion, prevention of diseases, and control of risk factors[3,8].

From this perspective, the need for the development of longitudinal studies among community-dwelling older people is reinforced, allowing for causal inferences. However, there is a scarcity of longitudinal investigations that have analyzed changes in the indication of depressive symptoms and their predictors in the older people population[3,4,8]. The scientific production concentrates on studies with a transversal design[5,6,9-13,17], which, although essential in clinical practice, does not allow for causality analysis and, consequently, the proposition of early action.

Thus, we aimed to analyze the prevalence of changes in the indicator of depressive symptoms among community-dwelling older people and its associated factors over two years.

METHODS

A longitudinal household survey, guided by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE), tool, was developed in the urban area of the city of Uberaba, Brazil. Data were collected through direct interviews in the homes of the older people at two moments: baseline (March to July 2016) and two-year follow-up (March to July 2018).

The population, selected by a multiple-stage conglomerate sampling process, consisted of older people participants of a larger project entitled "Dependence for daily life activities, frailty, and use of health services among the older people of the Triângulo Mineiro". To calculate the sample size, we considered as the main outcome the prevalence of depressive symptoms of 28.1%[5], with a precision of 1.5% and confidence interval of 95%, for a finite population of 36,703 people aged 60 years or more, reaching a sample of 816 older people.

For the selection of the older people, first, an arbitrary drawing of 50% of the census sectors of the municipality (n=204) was made through systematic sampling. Then, the number of households to be selected was calculated proportionally to the total number of older people residents in the municipality. Then, the number of households was divided by the number of census sectors, and a similar number of older people to be interviewed in each sector was obtained (n=4). Finally, in each census sector, the first household was arbitrarily selected and the others, in a standardized fashion, until the number of interviews calculated for each sector was reached (n=4). One older people person was recruited per household, and if there was more than one living in the place, the one who had the first contact with the interviewer was interviewed.

The current study included older people aged 60 years or older, who lived in the urban area of Uberaba and were interviewed in 2016 and 2018. In both moments, we excluded the older people living in Long-Stay Institutions; and/or with communication problems such as deafness, not corrected by devices and severe speech disorders; and/or with cognitive decline assessed by the Mini-Mental State Examination[18]. In the follow-up the losses were considered: not being located after three attempts by the interviewer; refusals; changes of address and death.

Among the 816 elderlies eligible at the baseline of the research, the exclusions occurred due to the sectors with no elderlies, with (n=24) and without (n=24) residence; and the presence of cognitive decline (n=154). Thus, the first moment was composed of 614 older people. At the two-year follow-up, exclusions were comprised among those with cognitive decline (n=15). Losses were characterized among seniors not found after three attempts (n=148); who refused to participate (n=32); change of address (n=15) and death (n=17) (Figure 1).

Thus, in the database, 387 older people were found to meet the established criteria and composed the final sample of the current study (Figure 1).

Data collection, in both moments, was carried out by ten health interviewers, who underwent training, qualification, and approach to ethical issues of the research. It is noteworthy that the interviewers were trained by the researchers, members of the Collective Health Research Group, and followed until they demonstrated the necessary skills to apply the instruments used in the current study.

The socio-demographic and economic data, the number of morbidities, and the self-assessment of health were obtained by applying a questionnaire designed and widely used by the members of the Collective Health Research Group.

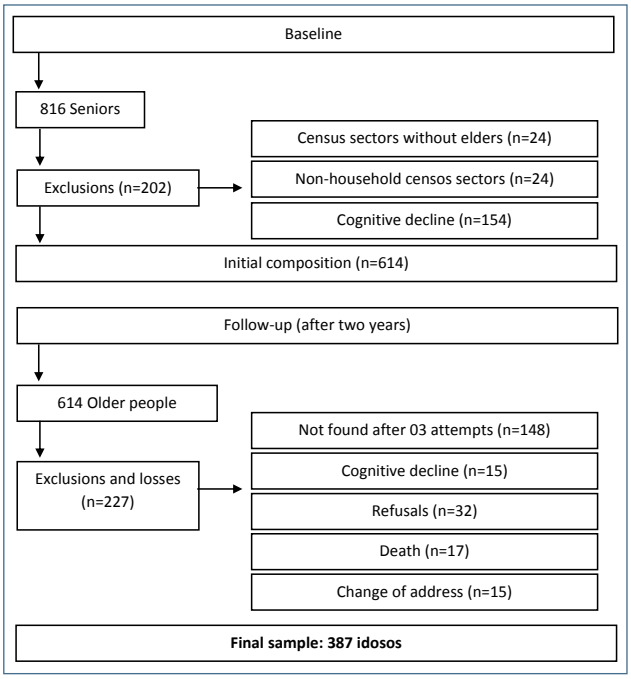

Figure 1: Composition of the sample. Uberaba, Brazil, 2016-2018.

To evaluate the functional capacity for IADL, the Lawton and Brody scale was used, adapted in Brazil, which allows the classification through a score that varies from 7 (higher level of dependence) to 21 points (complete independence), categorizing the older people as totally dependent (7 points), partially dependent (8 to 20 points) and independents (21 points)[19].

The Geriatric Depression Scale short form (GDS-15), validated in Brazil, was used to verify depressive symptoms. A score higher than five[20] was considered indicative of depressive symptoms[20].

The study variables were sociodemographic: gender (female and male), age group, in completed years (60 ⊢70; 70 ⊢80, and 80 or more) and living arrangement (alone; accompanied); economic: individual monthly income, minimum wages (no income; ≤1; >1); health: functional capacity for IADL (partial/total dependent; independent), IADL score (mean total IADL score), morbidities (0; 1 ⊢5; 5 or more), number of morbidities (mean number of morbidities), and self-assessment of health (negative; positive); and outcome: indicative of depressive symptoms (yes; no).

An electronic database was built in the Excel® program, with double entry. After checking and correcting the inconsistencies between the two databases, it was exported to the Statistical Package for the Social Sciences (SPSS®) version 22.0 for descriptive analysis (absolute and percentage frequencies) and multivariable analysis, with estimates of odds ratios of prevalence through the multinomial logistic regression model ($p<0.05$). For such analysis, the variables: sex (female; male); age group (60 ⊢80; 80 or more); living arrangement (alone; accompanied); individual monthly income (≤1; >1), and self-assessment of health (positive; negative) were used in the qualitative form and Baseline. For the quantitative variables, the differences (diff) between the follow-up in 2018 and the baseline in 2016 were calculated, being: the number of morbidities diff and the IADL score diff.

Furthermore, to verify changes in the indications of depressive symptoms, the older people were categorized according to the following groups: (I) improvement - older people with indications of depressive symptoms at baseline and absence of such symptoms at the two-year follow-up; (II) stability - older people who maintained the initial condition at follow-up; and (III) worsening - older people without indications of depressive symptoms at baseline and with this condition at the two-year follow-up. The reference group was the stability group, and the tests were considered significant when $p<0.05$.

The project was approved by the Ethics and Human Research Committee of a university in the Triângulo Mineiro. After the consent of the older person and the signing of the Informed Consent Form, the interview was conducted.

RESULTS

Among the 387 older people who completed the follow-up, it was identified, at both moments, that the indication of depressive symptoms was more prevalent among those who were female, aged 70 to 79 years, lived with someone, and had individual monthly income ≤1 minimum wage (Table 1). It is noteworthy that after two years of follow-up, there was a reduction in the prevalence of indicative depressive symptoms among older people females, aged 70 to 79 years, and who lived with someone. On the other hand, there was an increase in the prevalence of depressive symptoms among those who earned ≤1 minimum wage (Table 1).

Regarding health characteristics, we identified at baseline and two-year follow-up a higher prevalence of indicative depressive symptoms among the older people who self-assessed their health negatively, with 5 or more morbidities and partial/total dependence for IADL (Table 1). At the two-year follow-up, we also verified an increase in the percentage of depressive symptoms among the older people with negative self-assessment of health, with 5 or more morbidities and partial/total dependence for IADL (Table 1).

At baseline, the prevalence of older people individuals with indicative depressive symptoms was 27.6% and, after a two-year follow-up, its decrease was observed (24.3%). Furthermore, after two years of follow-up, 20.2% of the older people no longer had indications of depressive symptoms (improvement group), 63.0% maintained their initial condition (stability group), and 16.8% had new cases (worsening group).

In the improvement group, the positive self-assessment of health (OR: 2.43; *p=0.*003), independence for IADL (OR: 1.09; p=0.025) and the lower number of morbidities (OR: 0.91; p=*0.*002) were predictors for the absence of indicative depressive

Table 1: Frequency distribution of sociodemographic, economic, and health characteristics of the older people, at baseline and two-year follow-up, according to indicative of depressive symptoms. Uberaba, Brazil, 2016-2018.

Variables	Indicative of depressive symptoms							
	Baseline				Two-year Follow-up			
	Yes		No		Yes		No	
	n	%	n	%	n	%	n	%
Sex								
Female	79	73.8	181	64.6	64	68.1	196	66.9
Male	28	26.2	99	35.4	30	31.9	97	33.1
Age group (in years)								
60 ⊢70	44	41.1	111	39.6	28	29.8	110	37.5
70 ⊢80	50	46.7	117	41.8	43	45.7	119	40.6
80 or more	13	12.2	52	18.6	23	24.5	64	21.9
Housing arrangement								
Alone	22	20.6	56	20.0	24	25.5	46	15.7
Accompanied	85	79.4	224	80.0	70	74.5	247	84.3
Individual Monthly Income (in minimum wages)								
No income	12	11.2	23	8.2	05	5.3	18	6.1
≤ 1	55	51.4	117	41.8	51	54.3	154	52.6
> 1	40	37.4	140	50.0	38	40.4	121	41.3
Self-assessment of health								
Positive	34	31.8	154	55.0	20	21.3	156	53.2
Negative	73	68.2	126	45.0	72	78.7	137	46.8
Number of morbidities								
0	02	1.9	06	2.2	0,0	0.0	0,6	2.0
1 ⊢5	29	27.1	104	37.1	17	18.1	108	36.9
5 or more	76	71.0	170	60.7	77	81.9	179	61.1
Instrumental Activities of Daily Living								
Partial/total dependent	79	73.8	189	67.5	79	84.0	207	70.6
Independent	28	26.2	91	32.5	15	16.0	86	29.4

symptoms (Table 2). In the worsening group, the increase in the number of morbidities was predictive of the presence of indicative depressive symptoms (OR: 1.10; p=*0*.002) (Table 2).

DISCUSSION

The main findings of the current study express that positive self-assessment of health, functional independence for IADL, and a lower number of morbidities were predictors of improved depressive symptom indicators in community-dwelling older people; whereas, an increased number of morbidities was a predictor for the presence of this condition.

The predominance of older people women with indications of depressive symptoms at both moments corroborates studies developed in the community in Brazil[3], Japan[8], Canada, Latin America, and Albania[4]. In the survey developed in Pelotas, Brazil, the older people women presented approximately twice as many depressive symptoms as the men[21]. Due to social and gender issues, older people are likely more susceptible to stressful events, which can favor the emergence of depressive symptoms[22]. Furthermore, hormonal aspects and domestic violence are associated with damage to the mental health of older people women[23], as well as a higher prevalence of depressive symptoms[24]. These findings denote the greater social vulnerability of older people and women, since, also for them, the low levels of education and income, absence of a partner, and the presence of polymorbidity and functional limitations are frequent [3].

Corroborating, in part, with the current research, longitudinal investigations verified, at both times, in Canada and Albania, the highest percentage of indicative depressive symptoms among the older people aged 70 to 75 years, however, in Latin America[4], the predominance of this condition was among the youngest aged 60 to 69 years. It is plausible to verify that possible alterations, which occur with advancing age, such as the decline in functional capacity[12],

Table 2: Final multinomial logistic regression model for sociodemographic, economic, and health variables in the groups of improvement and worsening of the indicative depressive symptoms among older people. Uberaba, Brazil, 2016-2018.

Variables	Indicative of Depressive Symptoms					
	Group Improvement (n=78)			Group Worsening (n=65)		
	OR†	CI95%‡	*p**	OR†	CI95%‡	*p**
Sex						
Female	1			1		
Male	1.41	(0.73-2.71)	0.300	1.31	(0.69-2.48)	0.398
Age group (in complete years)						
80 or more	1			1		
60 ⊦80	0.75	(0.34-1.64)	0.474	1.46	(0.70-3.03)	0.306
Housing arrangement						
Alone	1			1		
Accompanied	1.32	(0.68-2.55)	0.404	1.19	(0.59-2.40)	0.627
Individual Monthly income (minimum wages)						
≤ 1	1			1		
>1	0.97	(0.55-1.71)	0.923	1.10	(0.61-1.98)	0.747
Health self-assessment						
Negative	1			1		
Positive	2.43	(1.35-4.40)	**0.003**	1.54	(0.86-2.74)	0.139
Instrumental activities of the daily living differences	1.09	(1.01-1.17)	**0.025**	0.95	(0.88-1.02)	0.148
Number of morbidities differences	0.91	(0.85-0.96)	**0.002**	1.10	(1.03-1.17)	**0.002**

†OR: Odds Ratio; ǂ CI 95%: confidence interval *$p<0.05$.

cognitive deficit, deprivation of social role, unproductivity, social isolation, feeling of uselessness[12], poor quality of sleep[8] and physical inactivity[12,13] can increase the vulnerability of the older people to adverse health outcomes, such as depressive symptomatology[9,12].

Regarding living arrangements, a divergent result was verified in a longitudinal study in Japan[8], in which the highest percentage of depressive symptoms was among the older people who lived alone. In this context, it is important to pay attention to loneliness in older people, even if they live with others and the reduction of their social ties as eminent factors of depressive symptoms[25]. It is also highlighted that, even if the older people person shares his/her home, the dissatisfaction in family relations can result in negative effects, generating risk conditions for depression and anxiety[26]. A longitudinal survey with community-dwelling older people subjects identified that the worst family functioning was associated with the presence of depressive symptoms[3], a fact that can contribute to the understanding of the results of the current study.

A higher prevalence of depressive symptoms among older people with low income was also observed in a longitudinal study conducted in São Paulo[3]. In Brazil, as a result of retirement, there is a substantial loss of purchasing power[27]. Associated with this, as individuals age, morbidities may appear or those already existing may require more complex interventions and access to more specialized and costly services[6,28,29]. Thus, the worsening of the economic situation causes worries and distress among older people and may favor the emergence and/or maintenance of depressive symptoms[6]. These findings express the daily challenge experienced by this population in maintaining basic needs and health care. Thus, health professionals must consider, besides the disease, the context in which the older people are inserted, for the establishment of health care assistance.

The predominance of depressive symptoms among the older people who self-assessed their health negatively, at both moments, corroborates the longitudinal research developed in the city of São Paulo[3]. This indicator involves the signs and symptoms of diseases and the impact of these conditions on the physical, mental, and social well-being of the older population[30]. Thus, nurses must perform this investigation during gerontological consultations, considering that how older people perceive their health condition is a factor that contributes to understanding the emergence of depressive symptoms in this age group[31].

Polymorbidity in older people is also a factor that can collaborate to the development of depressive symptoms[32]. In the current study, as well as in other longitudinal[3,4] and cross-sectional studies[5,12,13,17,32], the indication of depressive symptoms was more frequent among the older people with polymorbidity, evidencing the impact of chronic diseases on the mood of this population. The progressive decline in physiological reserves is capable of increasing the risk of developing several diseases[1], which can directly affect the biopsychosocial well-being of older people

according to their ability to adapt[33]. Thus, health professionals are challenged daily to create mechanisms for the effective care of older people with polymorbidity, to reduce the impacts of senility on their quality of life[33,34]. It is reinforced that, in face of the aging process of the population, the development of strategies for welcoming and strengthening the health professional/older people bond, as well as the early identification of factors that can contribute to the worsening of depressive symptoms, such as the presence of polymorbidity, and the consequent negative self-assessment of health[34].

The higher prevalence, in both moments, of depressive symptoms among partially/fully dependent older people for IADL was also identified in the longitudinal study carried out in the city of São Paulo[3], demonstrating the impact that functional limitation can have on older people's mood. Biological alterations throughout life, such as sarcopenia, decreased muscle strength and gait speed, and postural instability[28], negatively impact the performance of daily activities. The limitations to performing these activities generate instability of emotions and well-being and hurt the social participation of older people, which can trigger depressive symptoms[9,15]. In this context, the performance of primary care health professionals is essential to identify early the onset of the decline in functional capacity and propose health interventions, aiming to postpone dependence and, consequently, prevent the onset of depressive symptoms.

When assessing older people, health professionals must have a broad view of preventing the development and/or chronicity of depressive symptoms that, in turn, can lead to several physical, mental, and social health problems[9,16]. Thus, besides the aforementioned socio-demographic and economic characteristics, the self-assessment of health and the presence of morbidities and functional disabilities can be investigated in clinical practice.

The decrease in the prevalence of depressive symptoms over the follow-up period corroborates longitudinal studies[3,35] conducted among older people individuals in São Paulo[3] and the Republic of Latvia[35]. The occurrence of depressive symptoms in the older people population is associated with biopsychosocial aspects that may influence the onset and chronicity of depressive symptoms[15]. From this perspective, there is evidence that resilience[11], such as the practice of physical activity[12], and the social network and support[11] are factors that can contribute to older people's lower predisposition to depressive symptoms. However, these variables were not analyzed in the current study, which denotes the need for the development of longitudinal research with this approach.

It is also noteworthy that the use of soft technologies of care by health professionals in primary care, such as humanized embracement, bonding, and home visits, can contribute to the improvement of depressive symptoms over time[11,36,37]. The use of integrative and complementary practices of the Unified Health System, among them integrative community therapy, has proven to be an effective care tool in the mental health care of the older people population. Such use contributes as a support network and facilitator for the construction of bonds, which reflects the feeling of belonging to a group, increasing self-esteem and the sense of well-being of individuals[36].

As in this study, longitudinal investigations[3,35] have also verified that positive health self-assessment contributed to the improvement of depressive symptoms among older people. In research, it was observed that the self-assessment of positive health, by older people, helps in the use of mechanisms to combat anxiety and depression, and allows for greater resilience in facing chronic diseases[38]. Self-assessment of health is related to social and psychological aspects, expressed in depressive symptoms. Thus, its evaluation in health services is urgent, considering that it is an indicator that can subsidize health care according to the needs of older people[39]. Health promotion actions directed at older people with a risk of depressive symptoms and/or previous history are essential since they can positively influence the quality of life and aggregate a higher level of well-being in this population[40].

In a longitudinal study, it was verified that older people with no depressive symptoms, at baseline and six-year follow-up, presented a lower functional decline for IADL[3], reinforcing the findings of the current investigation, in which functional independence was a predictor of improvement in depressive symptoms. The functional independence to perform daily tasks enables a better practice of cognitive, physical, and social activities, and allows older people to become more active and socially involved, reducing the risks for the development of depressive symptoms[15]. The relationship between functional capacity for instrumental activities and the presence of indicative depressive symptoms can be considered a bidirectional path[3,14]. From this perspective, the need to identify the older people who are more vulnerable to these conditions emerges, for the early direction of interventions, and thus reduces the risks of negative outcomes caused by functional decline and depressive symptoms. Therefore, it is up to the primary care nurse, during the multidimensional assessment, to investigate social, emotional, and functional aspects of the older people person related to the preservation of autonomy and independence. The establishment of a bond favors the construction of a relationship based on welcoming, being fundamental in the elaboration of a specific care plan for each individual[1].

The lower number of morbidities was also a predictor of the absence of indicative depressive symptoms in national studies[3,32] and international[33]. Research verified that the occurrence of indicative depressive symptoms was twice as high among older people individuals with polymorbidity as related to those without this condition[32]. The findings of the longitudinal survey of older people in São Paulo indicate that having a better health condition can be a protective factor for depressive symptoms[3]. Differently from these results, in the longitudinal survey developed with older people in Canada, Latin America, and Albania, no significant associations

were observed between polymorbidity and changes in the depressive symptom indicator after a two-year follow-up[4].

It is noteworthy that the results also verified that the increase in the number of morbidities was a predictor of the presence of depressive symptoms, denoting its importance in this relationship. The presence of chronic diseases can imply functional limitations that affect the execution of activities related to personal, social, or work life, contributing to the appearance of mood disorders such as depressive symptoms[33]. Considering such results, it is emphasized that the healthcare professional must evaluate the presence of morbidities, as a way to intervene in the prevention of associated depressive symptoms and the impact on the active and healthy aging process. The healthcare teams can actively search for older people with potential risk for the development of depressive symptoms, as well as direct actions for the prevention and/or control of chronic diseases and the maintenance of autonomy since these factors influence the quality of life of the older people[5,9,12,15].

The current research has the limitation of self-reporting of morbidities. However, the findings may contribute to the direction of interventions aimed at the prevention of diseases and health promotion of the older people population.

In conclusion, after a two-year follow-up, there was a decrease in the prevalence of older people individuals with indicative depressive symptoms. In the improvement group, the reduction in the number of morbidities, positive self-assessment of health, and independence for IADL were predictors for the absence of indicative depressive symptoms; while, in the worsening group, the increase in the number of morbidities was a predictor for the presence of this condition.

Thus, it stands out that morbidities, as well as functional capacity and the way older people perceive their health, should be investigated and monitored in clinical practice, aiming at the prevention and/or improvement of depressive symptoms in the community of older people.

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