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IS THE HOLISTIC PHYSICAL FACTOR LINKED TO LIFE SATISFACTION IN OLDER AGE?

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Abstract

Background: The physical factor (health literacy, health status, functional ability to perform daily basic and instrumental activities and risk factors) is linked to life satisfaction in older age. The aim of this study is to establish the correlation between the physical holistic factor and life satisfaction in older age. **Material and Methods:** The quantitative research method was used. In order to sample the data, the authors chose a simple random sample. The designed questionnaire was filled in by 1064 older persons aged ≥ 65 years, living in social care institutions/nursing homes for older persons or in the home environment. The number of correctly completed survey questionnaires was 656. In order to measure life satisfaction, the *Satisfaction with Life Scale* was used. Within the physical factor, 4 indexes were formed. In order to be able to show the desired influences or links between the physical factor and life satisfaction, the authors used propensity score methods. **Results:** The individual indexes within the physical factor are linked to life satisfaction to a varying degree: health literacy ($R^2 = 0.137$), health status ($R^2 = 0.047$), the functional ability to perform daily basic and instrumental activities ($R^2 = 0.015$), and risk factors ($R^2 = 0.001$). The physical holistic factor is linked to life satisfaction in older age ($R^2 = 0.05$). **Conclusions:** With this research, the authors have proven that the older persons with high levels of health literacy, a good health status without chronic diseases, who are independent in performing daily basic and instrumental activities, and do not have any risk factors present, are more satisfied with their lives. Med Pr. 2019;70(5):535–43

Key words: quality of life, risk factors, satisfaction with life, physical factor, health literacy, older person

INTRODUCTION

Modern society ageing represents a challenge in the development of new strategies, which are predominantly needed both in the healthcare system and for ensuring the quality of life of older persons, and life satisfaction in old age [1]. Ageing is not synonymous with disease; it is a life-long process, and older age is a period in everyone's life.

The literature review demonstrates that holism in the field of medical and social gerontology has been poorly researched. Every older person represents a whole and requires a holistic treatment in order to be satisfied with their life in old age. This means that, from the perspective of the quality of life in older age, which is a multi-dimensional construct, all the needs of an older person must be considered. These stem from the person's bio-psycho-social and spiritual needs, a fact also confirmed by McEvoy and Duffy [2] who employed holism to consider a person as a whole and took into account the interconnection of the body, mind and spirit, emphasizing the importance of physical and mental well-being, as well as the socio-cultural influence of the ever-changing environment. Helvi [3], through the theory of healthy holistic ageing, focused on individuals as a whole, on their mind and environment.

The physical factor was designed on the basis of the scientific literature review performed by the authors, and defined by referring to the following 4 indexes: health literacy, health status, functional ability and risk factors.

The health literacy of older individuals is an important building block in their life satisfaction and, consequently, in their quality of life [4]. Nutbeam [5] stated

that health literacy represents a new concept in health promotion. It is a conglomerate of cognitive and social skills, which determine the individual's motivation to assess and understand the acquired information, and the critical use of such information in a manner that promotes and maintains health. An older person who is health-literate is an important factor in achieving an effective healthcare system, since researchers [4,6] have established that older people have limited health literacy. People's low health literacy is linked to worse health outcomes and less frequent use of healthcare services [7]. Toçi et al. [8] also noted that health literacy declines with age, whereby older persons, given their limited health literacy, have to bear the brunt of the healthcare system, the outcome of which can be harmful to their health. A causal relationship has been established between health literacy and health status.

An individual's health status is an important element in life satisfaction in older age. As a result of longevity, one can expect that a growing number of older individuals will suffer from one or more chronic diseases, which will affect their health status. Chronic diseases have an impact on the quality of life [9], a finding that has been supported by research showing that women have a poorer health status than men [10,11]. Rodrigues et al. [12] noted that falls influence the health of older people, as they cause limitations that express themselves through a poorer health status and a lower quality of life. According to previous findings [13], the presence of pain, anxiety and depression are negatively linked to the health-related quality of life.

It is important that an older person has the ability to function independently in their own home, but findings [14] show that older people living in social care institutions have lower functional abilities in comparison with those living at home. Life satisfaction in older age is influenced by the functional ability of older people [15] and their cognitive abilities [16], both of which play an important role in performing everyday activities.

In the context of the risk factors index, the authors studied the influence of alcohol and smoking on the quality of life. On the basis of their literature review, they included only the 2 most important risk factors for older adults. From this point of view, the research has some limitations. In older people with several different risk factors, the probability of their developing a chronic condition increases (for instance, cancer, coronary diseases, etc.). According to the available data [17], a higher percentage of smokers are male. The percentage of smokers decreases with age. The lowest percent-

age of smokers is among people aged ≥ 61. Excessive alcohol consumption in old age can also lead to alcohol addiction. Excessive alcohol consumption is associated with a lower quality of life [18] and is more frequently present in men with lower levels of education [19].

The aim of this research is to gain a greater understanding of the connection between the 4 indexes (independent variables) – health literacy, health status, functional ability and risk factors within the physical factor – and life satisfaction (the dependent variable) in older age. On this basis, the authors formed the following hypothesis: the physical factor is linked to life satisfaction in old age.

MATERIAL AND METHODS

Research methodology
For the purposes of this research, the authors used the quantitative research method. Owing to the complexity of the research problem, they chose several quantitative methods, which intertwined and allowed them to research and display their findings concerning the research problem. They used a deductive method, a causal non-experimental method, a method of description and a comparative method.

Measuring instrument
In order to collect data, the authors drafted a survey questionnaire based on information gathered in their literature review. The questionnaire was completed by respondents aged ≥ 65 years in social care institutions (nursing homes for older individuals) and in the home environment. For measuring life satisfaction, the *Satisfaction with Life Scale* (SWLS) was used [20], which consists of 5 items. The respondents evaluated their level of agreement with the items according to a 7-stage scale (1 – strongly disagree, 2 – disagree, 3 – partially disagree, 4 – neither agree nor disagree, 5 – partially agree, 6 – agree, and 7 – strongly agree). The SWLS was translated into the Slovenian language and validated [21]. The authors created 7 items for the study of the living conditions index and 13 items for the lifestyle index. The items could be answered: 1 – "nothing," 2 – "a little," 3 – "a moderate amount," 4 – "well," 5 – "very well;" 1 – "very dissatisfied," 2 – "dissatisfied," 3 – "neither satisfied nor dissatisfied," 4 – "satisfied," or 5 – "very satisfied." The items were developed on the basis of the literature review.

The health literacy index consisted of data on the health literacy of older people. The 4 items were eval-

uated by the respondents according to the Likert scale: 1 – "I strongly disagree," 2 – "I disagree," 3 – "undecided," 4 – "I agree," and 5 – "I strongly agree." The general health status index included data from the WHO-QOL-BREF [22] questionnaire. The functional ability to perform daily basic and instrumental activities index refers to performing instrumental activities during daily living (IADL) [23], whereby the older person's independence from or dependence on the help of another person is studied. Consent for the use of the IADL scale was obtained from "The Gerontologist" journal. The scale comprises 9 activities; each task is evaluated on a scale of 1–3, where 1 means entirely dependent on the help of another person, 2 – partially dependent on the help of another person, and 3 – independent or completely self-reliant. The index also includes data from a scale including other basic activities, which was developed for the needs of this research on the basis of the literature review and the model by Henderson [24]. It comprises 16 activities, which were evaluated by the respondents on a scale of 1–3. The last index, i.e., risk factors, includes data on smoking and alcohol. Other risk factors were not measured. The health literacy and risk factors indexes were developed on the basis of the literature review.

Sample and sampling procedure

The authors used a simple random sample. Based on the size of the population of people aged ≥ 65 years, they chose, according to the regions, proportionate stratified samples (the sample sizes in the stratums are proportional to the size of the stratum). To ensure the accuracy of the sample, they established a confidence interval (±3%), which meant that if 70% of the respondents answered a certain question in the affirmative way, the result for the entire studied population could be expected, with a 95% reliability (α = 0.05), to range 67–73%.

In this research, the authors used a sample of 1064 older individuals living either in the home environment (urban or rural, N = 532) or in a social care institution/nursing home for older people (public or private institutions with concession, N = 532) in each statistical region in Slovenia. The number of correctly completed survey questionnaires was 656/1064, which means that the yield of the sample was 61.6%. The sample yield was better in the home environment (N = 380, 57.9%) than in the social care institutions/nursing homes for older adults (N = 276, 42.1%). The percentage of older individuals who correctly and fully completed the questionnaire in social care institutions constituted 42.1% of the respondents. Table 1 presents the demographic characteristics of the older respondents.

The majority of the respondents were female (N = 470) and widowed (N = 302). Among the respondents, 33.9% had secondary (high school) education (Table 1). The average age of the respondents was 78.2 (SD = 8), and their average monthly income was EUR 722 (SD = 293). The sampling procedure took place in domestic environments (in the homes of older people, at meetings in local communities, in day activity centers, and at social gatherings of retired people) and in 21 social care institutions.

Among the participants, 184 (28%) had no chronic disease. A single chronic disease was present in 193 (29.4%) of the older persons, 2 diseases in 138 (21%), 3 in 81 (12.3%), and 4 or more chronic diseases in 60 (9.1%) of these older persons.

Statistical analysis of the data

In order to demonstrate the interconnections between the physical factor and life satisfaction, the authors used advanced statistical methods for the analysis of causal effects and conditional associations, also known as the "propensity score methods" [25]. The propensity score methods are used for association or the causal effect

Table 1. Demographic characteristics of the older adult respondents (aged ≥ 65 years)

Characteristics	Respondents (N = 656)	
	n	%
Gender		
male	186	28.4
female	470	71.6
Marital status		
married	246	37.5
single	48	7.3
widowed	302	46.0
divorced, separated	43	6.6
non-marital partnerships	17	2.6
Education		
elementary	132	20.1
vocational	146	22.3
secondary (high school)	229	33.9
higher	97	14.8
university graduates and post-graduate degrees	52	7.9

statistical analysis of a balanced study design, and enable the comparison of two statistically comparable groups. The aim of this research was to present the most reliable estimates of the potential associations, which are contingent on the variables and are used to balance the data/study plan.

Methodology of the analysis

Since this is a comparative study of data that was not collected on the basis of a completely randomized design, by means of a survey, the authors first balanced the study plan so that the group with a high level of the index would be comparable to the group with a low level of the index. To carry out this process, a propensity score was used [26], which is a balancing score, along with methods of matching. The propensity score was estimated on the basis of the observed covariates, which were selected based on logicality with regard to the studied data and the objective of the analysis (the influence of certain factors on life satisfaction). The objective was that the models for assessing the propensity score in all of the comparability studies would be the same. This meant that all of the comparability studies were conducted through a study plan that was balanced based on the same covariates. The selected covariates were as follows: gender, education, place of residence, and age. The propensity score was estimated by using logistic regression, based on the following model:

$$\text{logit(IK)} = \beta_0 + \beta_1 \text{gender} + \beta_2 \text{education} \times \text{location} + \beta_3 \text{age} \times \text{gender} \qquad (1)$$

where:
IK – each index within each individual factor under analysis.

For the model specification criterion, the authors used the balance of observed covariates. The selected model enabled them to balance the observed covariates between the units that reached the high and low levels of each index.

The R package of mice was used [27] to implement this procedure.

The ethical aspects of the study

Prior to the implementation of this research, the authors obtained a decision from their Faculty's Commission for Scientific Research Work, with the Commission assessing the ethical aspect of the research. The Commission for Scientific Research Work issued a decision (No. 130-014/2014) stating that both the research and the measuring instrument were in line with all of the ethical aspects of research work and suitable for the implementation of the study. All the respondents included in the study were acquainted with the purpose and course of the research prior to the implementation of the study. Each of the respondents gave informed consent prior to their participation in the study. The participants were informed that they had the right to withdraw from the study at any time.

RESULTS

The physical factors encompassed 4 indexes:
- health literacy,
- health status,
- the functional ability to perform daily basic and instrumental activities,
- risk factors.

Health literacy

Welch's t-test of the comparison of a matched sample among the individuals with high and low indexes of health literacy revealed that there was a statistically significant difference between the 2 groups (Table 2). As can be inferred from Table 2, those with a high health literacy index of $\overline{X}_V = 24.712$ were more satisfied with their lives than those with a low health literacy index of $\overline{X}_N = 21.488$. Despite the statistically significant difference, the average values of life satisfaction in both groups fall into the same category, according to SWLS, i.e., into the group with an average life satisfaction score in the range 20–24 pts. The results show that the group of older individuals with a higher level of health literacy reached the edge of the limit values, approaching the value of 25, where the next level begins (a high life satisfaction). The group with a lower value of health literacy slightly crossed the threshold between the categories of "slightly below average in life satisfaction" and "average life satisfaction." On average, those individuals with a high index of life satisfaction, according to the SWLS (*Life satisfaction*), almost reached a high level of life satisfaction ($\overline{X}_V = 24.712$).

As can be seen in Table 2, the maintained (effective) sample used in the analysis of this index was 496 or 75.61% of the entire sample. The confidence interval (CI) is defined by its lower and upper limits (random variables), which take different values in each sample. This means that when choosing the number of units in the sample from the entire population, and when constructing a CI for each sample, exactly 95% of the sam-

ples will contain the assessment parameter (in this case, the difference between the 2 groups). There is a 95% chance that the difference between the groups will remain within the given interval (95% CI: 1.815–4.633).

The estimate of the conditional association (Table 3) completes the results of the t-test and estimates a positive link between life satisfaction and health literacy. This means that when the health literacy of an older person improves, while all of the other factors remain unchanged, the individual's life satisfaction improves.

Health status
Welch's t-test of the comparison of a matched sample among the individuals with high and low indexes of health status revealed a statistically significant difference between the 2 groups (Table 2). As can be seen in Table 2, those with a high health status index of $\overline{X}_V = 24.080$ were more satisfied with their lives than those with a low health status index of $\overline{X}_N = 21.438$. Despite the statistically significant difference, the average values of life satisfaction in both groups fall into the same category, according to SWLS, i.e., into the group with an average life satisfaction score in the range 20–24 pts. The results show that the group of older individuals with a higher level of health status reached across the edge of the limit values. Individuals with a lower value of the health status

index slightly crossed the threshold between the categories of "slightly below average in life satisfaction" and "average life satisfaction."

As can be inferred from Table 2, the maintained (effective) sample that was used in the analysis of this index was 274, which accounted for 41.77% of the entire sample. As can also be seen in Table 2, there is a 95% chance that the difference between the 2 groups will remain within the given interval (95% CI: 4.040–1.245). The estimate of the conditional association (Table 3) shows that a positive link exists between life satisfaction and health status.

Functional ability to perform daily basic and instrumental activities
Welch's t-test of the comparison of the matched sample between the individuals with high and low indexes of the functional ability to perform daily basic and instrumental activities revealed that there was no statistically significant difference between the 2 groups (Table 2). As can be seen in Table 2, those with a high index of the functional ability to perform daily basic and instrumental activities $\overline{X}_V = 23.195$, were not more satisfied with their lives than those with a low index of functional ability to perform daily basic and instrumental activities $\overline{X}_N = 22.301$. There is no statistically significant

Table 2. Welch's t-test for the respective studied indexes included in the physical holistic factor

Index	$\overline{X}_V$	$\overline{X}_N$	95% CI	p	Maintained n (effective n) [n (%)]
Health literacy	24.712	21.488	1.815–4.633	< 0.001	496 (75.61)
Health status	24.080	21.438	4.040–1.245	< 0.001	274 (41.77)
Functional ability to perform daily basic and instrumental activities	23.195	22.301	−0.694–2.482	0.268	226 (34.45)
Risk factors (alcohol, smoking)	22.897	22.368	0.912–1.972	0.470	234 (35.7)

$\overline{X}_V$ – high level of the index, $\overline{X}_N$ – low level of the index, CI – confidence interval of the difference between $\overline{X}_V$ and $\overline{X}_N$.

Table 3. An estimate of the conditional association (link) between the respective indexes and life satisfaction of older adult respondents (aged ≥ 65 years old)

Index	Estimated value	SE	p	Maintained n (effective n) [n (%)]
Health literacy	14.498	1.637	< 0.001	496 (75.61)
Health status	18.242	4.979	< 0.001	274 (41.77)
Functional ability to perform daily basic and instrumental activities	5.324	2.892	0.067	226 (34.45)
Risk factors (alcohol, smoking)	1.143	2.217	0.607	234 (35.7)

difference between the 2 groups; the average values of life satisfaction for both groups fall into the same category, according to SWLS, that is, into the group with average life satisfaction in the range 20–24 pts. The results of the t-test show that, according to the available data, there is no statistically significant difference between the 2 groups. As can be seen in Table 2, the maintained (effective) sample that was used in the analysis of this index was 226 or 34.45% of the entire sample. It can be seen that there is a 95% chance that the difference between the two groups will remain within the given interval (95% CI: −0.694–2.482). Although there is no statistically significant difference between the 2 groups (Table 3), the estimate of the conditional association shows that a positive link exists between the functional ability to perform activities and life satisfaction.

Risk factors
Welch's t-test of the comparison of the matched sample between the individuals with high and low indexes of risk factors revealed that there was no statistically significant difference between the 2 groups (Table 2). As can be inferred from Table 2, the individuals who had high indexes of both risk factors (alcohol, smoking) $\overline{X}_N =$ 22.897, as well as those who had low indexes of both risk factors $\overline{X}_N =$ 22.368, were averagely satisfied with their lives in older age. There is no statistically significant difference between the 2 groups, and the average values of life satisfaction in both groups fell within the same category, according to SWLS, i.e., the group with average life satisfaction in the range 20–24 pts. The results in Table 2 suggest that the maintained (effective) sample that was used in the analysis of this index was 234 or 35.7% of the entire sample. As can also be seen in that table, there is a 95% chance that the difference between the groups will remain within the interval (95% CI: 0.912–1.972). Although there is no statistically significant difference between the 2 groups (Table 3), the estimate of the con-

ditional association shows a positive link between the 2 risk factors and life satisfaction. When the presence of the 2 factors is reduced, life satisfaction in older individuals increases. This correlation is, however, not statistically significant, likely owing to the small size of the sample.

Although the authors also used validated questionnaires for the physical factor, they were not included in their entirety – only certain variables were included. The value of the physical factor (Table 4) is this low because of the low values of the following indexes: health status, the functional ability to perform daily basic and instrumental activities, and risk factors, whereas the health literacy index is substantially higher ($R^2 = 0.137$). Based on above, it follows that the subsequence of the studied factors in respect to their value could be different if all the indexes were measured on the basis of methodologically validated constructs. Therefore, in a future study of the research problem, these limitations should be taken into consideration. The hypothesis was confirmed, as the authors were able to establish that the physical factor was linked to life satisfaction in older age ($R^2 = 0.05$).

DISCUSSION

The results of this research have shown that the physical factor (health literacy, health status, functional ability to perform daily basic and instrumental activities, and risk factors) is linked to life satisfaction in older age. The value of the physical factor is low, owing to the low values of the following indexes: health status, the functional ability to perform daily basic and instrumental activities, and risk factors, whereas the health literacy index is substantially higher. The health literacy and health status indexes are statistically significant. Those who live in social care institutions/nursing homes for older people need more assistance with daily basic and instrumental activities. Older individuals need the least assistance with using the phone, and the most with

Table 4. Multiple R-squares for respective indexes

Index	R^2	Maintained n (effective n) [n (%)]	p
Health literacy	0.137	496 (75.61)	< 0.001
Health status	0.047	274 (41.77)	< 0.001
Functional ability to perform daily basic and instrumental activities	0.015	226 (34.45)	0.067
Risk factors	0.001	234 (35.7)	0.607

Physical factor: R^2 (multiple R-squares) = 0.05.

repairs in their households, with doing the laundry, and with the use of public transport, although they are not entirely dependent on the help of another person in performing any of the instrumental activities.

The influence of health literacy on the quality of life of an older person, which involves the concept of life satisfaction, was also established by Razlag Kolar et al. [4]. Van Servellen [6] suggested that older individuals possess a limited level of health literacy, which means that low health literacy [7] is connected to worse health outcomes and less frequent use of healthcare services.

Toçi et al. [8] established a causal relationship between health literacy and health status, and noted that health literacy constantly declines with age, whereby older individuals have to bear the brunt of their limited health literacy, which presents itself as an outcome harmful to their health. Boyle et al. [28] established that a direct link exists between the level of health literacy and the age of an individual, and that an indirect link exists between mental abilities and long-term memory.

The assessment of the health literacy levels of individuals and groups serves as the foundation for educating the patients or groups to whom health education measures, programs, and interventions should be adapted [4]. The role of doctors, registered nurses, social gerontologists, and other experts who come together when working with older people is to contribute to their improved health literacy. Older people have to be empowered with knowledge in order for them to find relevant information connected to health, while health professionals should help them use this information in the correct manner.

The majority of the older individuals who participated in the study suffered from 1 or several chronic diseases. A little less than a quarter of the older people had no chronic diseases. The authors established that older people who suffered from several chronic diseases were more dependent on the help of other people. A negative correlation between chronic diseases and doing housework was found to exist (–0.251, p = 0.01), which means that the older individuals who suffered from several chronic diseases needed more help with housework than other people. Lima et al. [29] noted that, irrespective of the type of the chronic disease, the latter had an impact on the individual's health-related quality of life. The presence of more than 3 chronic diseases substantially affected the older person's quality of life in a negative way.

Rant [30] divided daily activities into basic and instrumental daily activities. The authors of this article noted a statistical characteristic that people who lived in social care institutions needed more help than older individuals living at home. Rant [30] noted that older people, aged ≤ 79, were predominantly independent in the performance of daily activities, whereas later on, their independence started to decline. Only 20% of people aged ≥ 90 years were independent. In other instrumental daily activities, older people tended to be independent until the age of 74, whereas later on their independence started to decline, which was also confirmed by this research, as the authors noted that the age of the person influenced the performance of instrumental activities. People aged ≥ 81 generally needed statistically more help than people below the age of 80 (p < 0.001).

According to Moorhouse and Rockwood [31], the IADL scale is used to establish the competence to perform banking/financial activities, activities connected to using transport, cooking, cleaning, managing medications and shopping. By using the IADL scale, the authors established that older people experience the fewest problems with using the phone and with independent medication management. Older people need the most assistance with doing the laundry and with household repairs.

In this study, the authors established that women were more independent in performing household chores (cooking, cleaning, tidying up, gardening, cooking, household repairs) than men. These differences are, however, not statistically characteristic in respect to the studied population. They also noted that older individuals (aged ≥ 76) needed more help than those aged ≤ 75 years. The marital status of an older person was found to have an influence on their independence in performing household chores. Single people need statistically more help than married people of the same age.

Smoking and alcohol consumption are 2 factors that influence the healthy lifestyle in older age in a negative way. The authors noted that very few of the older people included in the study smoked regularly (5.8%) or occasionally (3.2%). The fact that the majority of older people do not smoke is encouraging, since according to Koprivnikar [17], the percentage of smokers declines with age. This was also established by Razlag Kolar et al. [4], who are of the opinion that older people are aware of the adverse consequences of unhealthy habits on one's health.

The limitations of the study

This study has some limitations when it comes to the applied methodology, the size of the sample, and the

fact that only 2 risk factors (alcohol and smoking) were included. In subsequent studies, it would be prudent to include other risk factors that may be of importance to older adults. The results were obtained through the analysis conducted on a balanced study plan; therefore, they can be generalized to the population of older people. In the future, it would be essential to pay attention to the study of the elements of respective indexes and their influence on life satisfaction. In terms of scientific originality, this paper provides an important contribution to the understanding of life satisfaction in older age and the importance of the holistic treatment of older individuals.

CONCLUSIONS

By way of this study, the authors have established that an individual as a whole is influenced by the physical factor, which enables a person to lead a fulfilled and high-quality life in older age. They have proven that older individuals with high levels of health literacy, good health status without chronic diseases, who are independent in performing daily basic and instrumental activities, and do not have any risk factors, are more satisfied with their lives. If the results were to be applied in the domestic as well as social environment, certain changes would be required, including both organizational changes and changes in individual providers of healthcare and social services. For the holistic treatment of an older person, in which the physical factor is just 1 of the 4 holistic factors, structural and procedural changes will be required. With the above mentioned changes, a better quality outcome will be achieved, which in this case means a higher level of life satisfaction in older age. The domestic environment will respond more quickly to the necessary changes, whereas the institutional environment will face the challenge presented by complex changes.

The originality of this research is found in the study of the physical factor within the holistic model of life satisfaction in older age, which also includes the psychological, social and spiritual factor.

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