

Review of nursing diagnosis *Sedentary Lifestyle* in individuals with hypertension: conceptual analysis*

REVISÃO DO DIAGNÓSTICO DE ENFERMAGEM *ESTILO DE VIDA SEDENTÁRIO* EM PESSOAS COM HIPERTENSÃO ARTERIAL: ANÁLISE CONCEITUAL

REVISIÓN DE DIAGNÓSTICO DE ENFERMERÍA *ESTILO DE VIDA SEDENTARIO* EN PERSONAS CON HIGH BLOOD PRESSURE: ANÁLISIS CONCEPTUAL

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ABSTRACT

This study aims to review the components of the nursing diagnosis *Sedentary Lifestyle* (SL) proposed by NANDA (North American Nursing Diagnosis Association)-I in individuals with hypertension. The review was developed based on a concept analysis and supported by the Integrative Literature Review method, through which 43 articles were surveyed from five databases (LILACS, CINAHL, PUBMED, SCOPUS and COCHRANE). The following combinations of descriptors and their English and Spanish equivalents were used: *Sedentary Lifestyle and Hypertension* and *Sedentary and Hypertension*. Based on the review process, we found that the SL definition has changed, some clinical indicators have been identified and other indicators have been added to the definition. The study promotes a direction for diagnostic efficiency of clinical SL indicators, contributing to the refinement and improvement of this diagnosis and its components.

DESCRIPTORS

Nursing diagnosis
Sedentary lifestyle
Hypertension

RESUMO

Este estudo tem por finalidade revisar os componentes do diagnóstico de enfermagem *Estilo de vida sedentário* (EVS) propostos pela NANDA-I em indivíduos com hipertensão arterial. A revisão foi desenvolvida a partir da análise de conceito, com o auxílio do método da Revisão Integrativa da Literatura a partir de 43 artigos pesquisados em cinco bases de dados (LILACS, CINAHL, PUBMED, SCOPUS E COCHRANE). Foram utilizadas as seguintes combinações de descritores e equivalentes nas línguas inglesa e espanhola: *Estilo de vida sedentário and Hipertensão* e *Sedentarismo and Hipertensão*. O processo de revisão conduziu aos seguintes resultados: modificação da definição do EVS, de nomeações de alguns indicadores clínicos e acréscimo de outros. Considera-se que o estudo subsidiou uma direção para a eficiência diagnóstica de indicadores clínicos do EVS, contribuindo para o refinamento e o aprimoramento desse diagnóstico e seus componentes.

DESCRITORES

Diagnóstico de enfermagem
Estilo de vida sedentário
Hipertensão

RESUMEN

Este estudio tiene el objetivo de revisar los elementos del diagnóstico de enfermería *estilo de vida sedentario* (EVS) propuestos por la NANDA-I en pacientes con hipertensión. La revisión se desarrolló a partir del análisis de concepto, con la ayuda del método de revisión integradora de la literatura de los 43 artículos examinados en cinco bases de datos (LILACS, CINAHL, PubMed, SCOPUS y Cochrane). Se utilizaron las siguientes combinaciones de descriptores y equivalentes en Inglés y español: *sedentarismo y hipertensión* y también *estilo de vida sedentario y hipertensión*. El proceso de revisión llevó a los siguientes resultados: modificación de la definición del EVS, nombramientos de algunos indicadores clínicos y adición de otros. Se considera que el estudio subsidia una dirección para la precisión diagnóstica de los indicadores clínicos de la EVS, contribuyendo a la mejora y perfeccionamiento del diagnóstico y sus componentes.

DESCRIPTORES

Diagnóstico de enfermería
Estilo de vida sedentario
Hipertensión

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INTRODUCTION

This study aims to review the components of the nursing diagnosis *Sedentary Lifestyle* (SL) in individuals with hypertension based on a concept analysis. The study is based on the need for an evaluation of this diagnosis regarding the appropriateness of the definition, the defining characteristics (DC) and the related factors (RF) in this population, in addition to the fact that there are other relevant clinical SL indicators beyond those defined by NANDA International (North American Nursing Diagnosis Association-I).

The classification system for nursing diagnoses from NANDA International-I is one of the most widely used systems worldwide. However, to remain evidence-based, the taxonomic structure needs continual improvements to ensure the conceptual structure is appropriate. Thus, it is important to understand the structure's concepts and proposals and then test, validate and analyze them regarding their applicability in different contexts⁽¹⁾.

Due to the recent inclusion of the SL diagnosis in the NANDA-I taxonomy, the number of studies that consider SL as a nursing diagnosis is limited. Furthermore, there are global concerns about this lifestyle, which is an indicator of health risk that can have serious negative consequences for individuals, families and communities. Currently, it is well established that a daily routine of physical exercise helps in health promotion and in prevention and rehabilitation of individuals with hypertension, due to exercise's beneficial effects on the cardiovascular system and control of other risk indicators.

Based on the evidence relating SL to hypertensive patients' health, the global concern about this lifestyle, the limited nursing studies involving this diagnosis and the use of the SL diagnosis in health care, validation of this diagnosis becomes essential.

Consequently, the following questions have arisen: does the definition of the diagnosis provide a clear and representative description? Are there other defining characteristics or related factors, in addition to those already identified, that trigger this human response in individuals with hypertension? Is there a need to identify and add defining characteristics or related factors to the diagnosis SL in individuals with hypertension?

The relevance of such an investigation is based on the importance of preventing a sedentary lifestyle for cardiovascular health, the scarcity of validation studies and the need to refine the diagnostic criteria in specific populations, exemplified here by individuals with hypertension. The diagnostic inference is crucial for choosing appropriate interventions and, therefore, the quality of the nursing care provided.

To answer the questions raised, this study aims to review the components of the SL nursing diagnosis proposed by the NANDA-I (definition, defining characteristics and related factors) in individuals with hypertension.

METHODS

A review of the nursing diagnosis SL was developed based on a concept analysis, which is the first step of the validation process and corresponds to the theoretical framework. This framework seeks to build knowledge about the phenomenon in the search for evidence about the nursing diagnosis under study, its concept, the defining characteristics and related factors, as well as new components⁽¹⁻²⁾. The identification and formulation of the concepts are the first step in developing a new diagnosis and improving an already-accepted diagnosis⁽¹⁾.

The methods of the Integrative Literature Review and the Concept Analysis model were followed to conduct the concept analysis⁽²⁻³⁾.

Integrative literature review

The aim of the literature review was to present the knowledge obtained about SL and its determinants in individuals with hypertension in order to answer two guiding questions: What is the definition of SL in individuals with hypertension? What are the components of this nursing diagnosis in individuals with hypertension?

The following databases were used for the literature review: Latin American and Caribbean Health Sciences Literature (Literatura Latino-Americana em Ciências de Saúde - LILACS), National Library of Medicine and National Institutes of Health (PubMed), Cumulative Index to Nursing and Allied Health Literature (CINAHL), SCOPUS and Cochrane. Several databases were used to broaden the scope of the research and thus minimize potential biases.

To survey the studies and expand the search, the following combinations were used: *Sedentary and Hypertension* and *Sedentary lifestyle and Hypertension*. The following inclusion criteria were established: full papers available electronically; focused on the research theme in individuals over 18 years; addressed the concept to be analyzed; responded to the guiding questions; and written in Portuguese, English or Spanish. The exclusion criteria were the following: studies written as editorials and letters to the editor or studies duplicated in other databases.

The survey took place in August 2010. The selected articles were submitted to three careful and detailed readings for content analysis. Article selection from the five databases was conducted from September to November 2010 and is shown in Table 1.

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Table 1 – Selection process of the articles in the databases - Fortaleza, 2011

Article/Database	SCOPUS	CINAHL	PUBMED	COCHRANE	LILACS	Total
Found	1,526	241	291	69	95	2,222
Excluded	1,502	232	285	68	92	2,179
Selected	24	9	6	1	3	94

The data evaluation focused on methodological quality and was performed by classifying the strength of evidence for each study evaluated⁽⁴⁾. Information obtained from each article was identified and documented. The data evaluation and analysis were conducted from December 2010 to February 2011.

Walker and Avant's concept analysis model

Eight steps for conducting a conceptual analysis are described as follows: concept selection; determination of the objectives; identification of the possible uses of the concept; determination of the critical or essential attributes; construction of a model case; construction of additional cases; identification of antecedents and consequences of the concept; and definition of empirical referents⁽³⁾. Despite being presented sequentially, these steps are interactive and occur concomitantly with the integrative review. The analysis of the *sedentary* concept was performed based on the information obtained by the integrative review.

To identify the critical attributes related to the concept of sedentary lifestyle in individuals with hypertension, the following questions were used: How do the authors define the concept? What are the characteristics or attributes mentioned? Which aspects of sedentary lifestyle in individuals with hypertension do the authors discuss?

The antecedents and consequences were identified based on the answers to the following questions: What factors contribute to sedentary lifestyle in individuals with hypertension? What are the events or situations resulting from a sedentary lifestyle in individuals with hypertension? Considering the nursing diagnosis structure, are the antecedents and consequences representative of the related factors and defining characteristics, respectively?

The results are presented according to the steps of the concept analysis applied; a description of the empirical referents was not included because this description was not required to address the proposed objective.

RESULTS

The articles were mainly from North America (48.8%) and Europe (27.9%) and developed by physicians (32.6%) and nurses (30.3%). It is notable that the seven studies from South America were developed in Brazil. Twenty-two (51.2%) of the studies were published after 2007.

Most studies involved adults and/or elderly adults (83.7%) and focused on primary care (25.6%). In addition to these, 11 studies (25.5%) were conducted in gyms/laboratories or households and specifically involved the role of physical exercise in reducing blood pressure values or the adoption of physical activity following an intervention.

Regarding the study design, 32.6% were descriptive or qualitative; well-designed clinical trials without randomization and the reviews of descriptive or qualitative studies comprised 18.6% of the studies. Thus, the strength of most of the articles analyzed was distributed into levels III, V and VI, given the lack of strong clinical evidence.

Identification of possible uses of the concept

In the 43 analyzed studies, 42 used the concept of *sedentary* to represent an important risk factor for hypertension and complications resulting from the disease. Only one study addressed the concept as a nursing diagnosis, confirming the limited number of studies using this approach. In general, the studies characterized sedentary behavior as a lifestyle marked by the absence or insufficiency of physical exercise.

Critical or essential attributes of the sedentary concept

Among the 43 analyzed publications, 25 (58.1%) addressed the sedentary lifestyle concept. During the analyses, the intensity, frequency and duration of physical activity were configured as critical attributes.

In most of the definitions presented, sedentary behavior was characterized by a lack of physical activity of at least moderate intensity, with maximum oxygen consumption (VO_{2max}) ranging from 40 to 85% or heart rate variation of 50 to 85% HR_{max} . As for the frequency and duration of physical activity, most authors defined *sedentary* when this practice was not performed on most days of the week (four or more days) for at least 30 minutes.

The design of a model case and a contrary case permitted greater clarity of the critical attributes and thus, provided better comprehension of the *sedentary* concept.

Design of a model case

B.V.G., 50 years old, male, married, born and raised in Cratéus-Ceará. Hypertension was diagnosed five years ago. He was referred to a state reference center for hypertension

monitoring with the main complaint of failing to control the disease. There was no previous history of dyslipidemia, diabetes or other systemic diseases. He states that he regularly uses the prescribed medications, but fails to adhere to a few general guidelines. He denies smoking and is obese. He has poor eating habits: he does not eat vegetables, eats few fruits and typically consumes fatty and salty foods. He drinks alcohol occasionally on weekends when he meets with friends. Regarding physical activity, he walks around the square next to his house once a week for 20 minutes. He states that he walks slowly because he is not in good physical condition to walk faster. At the time of evaluation, the average of three blood pressure measurements for the patient was 162/106 mmHg.

Considering this case, it is clear that the essential attributes of physical activity, such as frequency, intensity and duration, are not followed as recommended, therefore classifying B.V.G. as sedentary.

Construction of a contrary case

N.G.F. 67 years old, male, retired, divorced, born and raised in Fortaleza-Ceará. Systemic hypertension was diagnosed 12 years ago and since then he has received treatment. He is monitored monthly by the family health care team of a Basic Health Unit. In these 12 years, he has adhered to the medication treatment and followed the guidelines regarding a healthy lifestyle. In the nursing visit, he said that on Tuesdays and Thursdays he participates in the aerobics group promoted by the Military Fire Brigade of Ceará State, lasting 60 minutes. In addition to this exercise, on Mondays and Wednesdays he walks in a square near to his home for 30 minutes. He stated that, at the end of the exercises, his heart rate is 96 beats per minute (bpm). At the time of the visit, the average of three blood pressure measurements

was 128/86 mmHg.

In this contrasting case, it is clear that N.G.F. cannot be considered a sedentary individual. The following critical attributes were observed: intensity (heart rate representing 62.7% HR_{max}), duration and frequency (60 minutes on Tuesdays and Thursdays and 30 minutes on Mondays and Wednesdays). Additionally, the type of physical activity (aerobics and walking) was also referenced.

Based on the examination of the definitions of *sedentary* and the essential attributes to this concept highlighted in the literature, a single, objective and clear definition that incorporates the results of this conceptual analysis was constituted from the model and contrary cases shown above: *Sedentary lifestyle refers to a lifestyle in which the individual does not perform physical activity at the recommended frequency, duration and intensity.*

Identifying the antecedents and consequences of the concept of sedentary

As shown in Boxes 1 and 2, in addition to the indicators already identified in the taxonomy II of the NANDA-I (2010), we proposed seven related factors and four defining characteristics to be evaluated, judged and added to the official list. The number of articles related to the antecedents/consequences of sedentary behavior is also included in the boxes.

The most cited antecedents (emotional reactions and activity intolerance) and consequences (report of health disorders and overweight) in the literature are not included in the NANDA-I indicators. Moreover, two factors were highlighted in the literature with different nomenclatures from those used by NANDA-I⁽¹⁾.

DISCUSSION

Chart 1 – Related factors (RF) obtained from the concept analysis and the nursing diagnosis SL of the NANDA-I taxonomy - Fortaleza, 2011.

FR NANDA-I (2010)	Antecedents – concept analysis
Poor knowledge about the benefits that physical activity provides to health	Poor knowledge about the benefits that physical activity provides to health and/or the consequences of a sedentary lifestyle (5 articles)
There is no corresponding factor	Attitudes, beliefs and health habits that make physical activity more difficult (4 articles)
Lack of motivation	Lack of motivation (5 articles)
Lack of interest	Lack of interest (3 articles)
There is no corresponding factor	Lack of social support (4 articles)
Lack of resources (time, money, company, structure)	Lack of resources (time, money, place, safety, equipment) (9 articles)
There is no corresponding factor	Low self-efficacy for physical exercise (5 articles)
Lack of training for performing physical exercise	Lack of training for performing physical exercise (1 article)
There is no corresponding factor	Impaired mobility (2 articles)
There is no corresponding factor	Activity intolerance (6 articles)
There is no corresponding factor	Pain (3 articles)
There is no corresponding factor	Emotional reactions (7 articles)

Chart 2 – Defining characteristics (DC) obtained from the concept analysis and the nursing diagnosis SL of the NANDA-I taxonomy - Fortaleza, 2011.

DC NANDA-I (2010)	Consequences - concept analysis
There is no corresponding characteristic	Overweight (5 articles)
Demonstration of lack of fitness	Decreased cardiorespiratory endurance (1 article)
	Decreased muscle strength (1 article)
	Decreased joint flexibility (1 article)
Choice of a daily routine without physical exercise	Choice of a daily routine without physical exercise (1 article)
There is no corresponding characteristic	No physical activities included in leisure time (1 article)
States preference for activities with little physical exercise	States preference for activities with little physical exercise (2 articles)
There is no corresponding characteristic	Low performance in activities of daily living (2 articles)
There is no corresponding characteristic	Report of health disorders (11 articles)

For better understanding of the concept, it is essential to emphasize that the terms *physical activity* and *physical exercise* are not synonymous, although they are frequently considered equivalent. Physical activity is any bodily movement that results from the contraction of the musculoskeletal system and results in energy expenditure greater than resting levels. In contrast, physical exercise is considered planned, structured and repetitive physical activity aimed at improvement and maintenance of physical fitness and whose health benefits depend on the intensity, frequency, duration and type of activity⁽⁵⁾.

The diagnostic label from the NANDA-I Taxonomy II that refers to *sedentary* behavior is Sedentary Lifestyle, which is defined as a lifestyle characterized by a low level of physical activity⁽¹⁾. This definition does not specifically address any of the features shown in the literature and confirmed in the present conceptual analysis, thus interfering with the diagnostic inference process. Therefore, revision and reformulation of the nursing diagnosis SL are suggested.

Evidence shows that when nurses use a patient-centered approach, making the patient an active participant, an increase in knowledge and satisfaction are obtained with a consequent increase in adherence and improved health outcomes⁽⁶⁾. This approach also promotes training and competence for managing health problems. In addition, instructions for individualized exercises that are understandable and planned according to the patient's needs, goals, initial abilities and clinical history are considered helpful⁽⁷⁾.

Research supports that individual attitudes and beliefs related to lifestyle play a critical role in controlling blood pressure, as beliefs, attitudes and habits directly influence the adoption of healthy habits⁽⁷⁾. Moreover, individual beliefs impact the decision to practice physical exercise, and an understanding of these perceptions, attitudes and beliefs is essential to understand behaviors and guide behavior changes⁽⁸⁾.

Motivation and interest are determinants of a patient's adoption, maintenance and/or discontinuance of a prevention and/or cardiovascular rehabilitation program⁽⁹⁾. In

addition, desire, pleasure and satisfaction are correlated with the practice of physical exercise; decision-making is a process in which the individual goes through a series of stages where interactions with people or events create a favorable environment that motivate him/her to make a decision for his/her health⁽¹⁰⁾.

Regarding social support, it is believed that the participation of a spouse, other family members and friends in the teaching-learning process supports behavioral changes. Family members aid in hypertension monitoring, and including family members in health intervention programs plays an important role in reducing risk factors for cardiovascular morbidity, making family involvement an important component of interventions for the initiation and maintenance of physical exercise⁽¹⁰⁻¹¹⁾. The performance of the various segments of the social network might improve adoption of the treatment, changing the lifestyle and thereby improving hypertensive patients' quality of life.

Low participation in physical exercise programs is a large public health problem; it is well known that there are several personal and environmental factors involved in this matter, ranging from the interference of family, friends and health professionals to the influence of climate and access to facilities, in addition to the availability of time and financial resources⁽¹²⁻¹³⁾.

Among the evidence from the literature analyzed, low self-efficacy has negative effects on physical exercise practices. Self-efficacy, according to the social-cognitive theory, is a cognitive mechanism that measures the motivation of people in their thought patterns and conduct, reflecting the challenges they face, the effort they put towards the activity and perseverance in the face of difficulties⁽¹³⁾.

It is known that in addition to the direct benefits related to blood pressure resulting from a regular training program, better fitness is achieved through maintenance of a daily physical exercise routine, making individuals more active⁽⁹⁾. It is noteworthy that different types of exercises, programmed according to the ability of each individual, that are simple, inexpensive and have a social component tend

to produce greater motivational and psychological impact⁽⁸⁾.

Among the related factors suggested, *impaired mobility*, *activity intolerance* and *pain* are similar to the nursing diagnosis configured in the NANDA-I Taxonomy II⁽¹⁾. It is worth mentioning that SL is a related factor of the nursing diagnoses *impaired physical mobility* and *activity intolerance*. Therefore, it is understood that there is cause-effect relationship of between sedentary lifestyle and impaired mobility, as well as between sedentary lifestyle and activity intolerance.

Unquestionably, mobility or an individual's capacity for movement is an extremely important component of physical function, and it is a prerequisite to accomplish the activities of daily living, maintain independence and practice physical exercise. The nursing diagnosis *impaired physical mobility*, present in 58.2% of elderly adults, impairs gait and walking as well as the execution of daily activities. This condition reflects the importance of encouraging practices that aim towards movement, walking, balance and muscle strength⁽¹⁴⁾. Furthermore, in addition to promoting social and psychological problems, inactivity impairs physical fitness, functional abilities in daily activities and mobility⁽¹⁵⁾.

As in the case of impaired mobility, individuals who present with activity intolerance, characterized by dyspnea, discomfort, weakness and/or abnormal heart rate response, will have difficulties performing physical exercise. In addition to the signs and symptoms of activity intolerance, pain, whether acute or chronic, may hinder physical exercise. In general, musculoskeletal syndromes are the most common causes of discomfort and/or pain, interfering directly in the execution of physical exercise⁽¹⁶⁾.

Emotional manifestations, such as fear of falling, moodiness, feelings of boredom, shame, discouragement and depression are also potentially negative for physical exercise, preventing exercise or making exercise more difficult⁽¹⁷⁾.

In addition to the factors that may culminate in a sedentary lifestyle, the concept analysis also provided evidence to characterize sedentary lifestyle. As for *overweight*, studies demonstrated that sedentary lifestyle is connected directly or indirectly to cardiovascular morbidity and mortality, especially when BMI (body mass index) is greater than 30 kg/m². One of the contributing factors to the current obesity pandemic is increasing sedentary behavior in the population⁽¹⁸⁾.

In a broader approach, cardiorespiratory endurance, muscle strength and joint flexibility are considered components of fitness (5). This relationship was demonstrated in a study in which active individuals reported moderate capacity (25%), good capacity (60%) and excellent capacity (15%), and sedentary individuals reported capacities ranging from very poor (7%) to weak (33%) and moderate (60%). Moreover, the active group showed muscular strength, endurance and flexibility for sports, while the sedentary group showed the opposite. The sedentary study participants confirmed not having the desired strength, muscle

endurance or flexibility⁽¹⁹⁾.

As described in the results of the concept analysis, the defining characteristics *choice of a daily routine without physical exercise*, *no physical activities in leisure time* and *preference for activities with little physical exercise* are related because if the individuals with hypertension prefer activities with little physical exercise, they will likely have a daily routine without exercise and will not use leisure time for physical exercise.

Regular practice of physical exercise has been identified as an important action in public health. This possibility is theoretically supported by the beneficial influence of an active lifestyle and the negative influence of a sedentary lifestyle that, in turn, is based on the widespread association between physical activity and morbimortality indicators⁽²⁰⁾. In contrast, evidence shows that a regular physical exercise routine decreases blood pressure, reduces cardiovascular mortality by 30%⁽⁹⁾, increases physical fitness, promotes weight loss and improves quality of life^(8,21).

In a complex approach, a long-term sedentary lifestyle is associated with other disabilities, which may result in difficulty performing activities of daily living (ADL), particularly the instrumental activities of daily living (IADL). Thus, *low performance in activities of daily living*, which include not only the basic activities but also the instrumental ones, can exert significant effects on life, especially in elderly patients with hypertension.

Regarding the defining characteristic *report of health disorders*, the findings in the discussion about the relationship between sedentary behavior and morbimortality are consistent, given the knowledge that sedentary lifestyle is one of the most important preventable causes of mortality. Estimates indicate that a shift from a sedentary lifestyle to an active one results in an average increase in life expectancy of 2.15 years⁽¹²⁾. Controlled studies show that those who enroll in a physical activity program decrease the risk of death by 25%⁽²²⁾.

Thus, it is believed that the present study will provide support to other stages of the validation process for the diagnosis SL. Once the diagnosis is validated and refined, it will allow for more accurate recognition of indicative signs of this diagnosis, providing a more reliable identification of this human response, favoring more effective interventions, either independently or in collaboration with a multidisciplinary team.

CONCLUSION

The intensity, frequency and duration of physical activity are attributes considered essential to comprehend the concept analysis. We recommend the following:

- the reformulation of the definition of the SL nursing diagnosis in the NANDA-I;

- the incorporation of seven related factors and four defining characteristics to the existing list of NANDA-I for SL, as well as the reformulation of two of the factors that already exist;
- the division of the characteristic *demonstration of lack of fitness* into *decreased cardiorespiratory endurance*, *decreased muscle strength* and *decreased joint flexibility*.

The fact that the literature search was performed by a single researcher, when it is suggested to be performed in pairs, and the lack of studies on sedentary lifestyle as a nursing diagnosis may be considered limitations of

this study.

The study, however, provides a direction for the diagnostic efficiency of clinical indicators of SL, contributing to the refinement and improvement of the diagnosis and its components in the NANDA-I Taxonomy II.

Further studies are recommended on this topic to deepen and disseminate the knowledge of this diagnosis. Validation by specialists and clinical validation to confirm the results of this study are therefore essential.

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