Emotions and Expressions through the Planning of Nursing Simulated Clinical Scenarios in Different Cultures

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Abstract

Objective: To analyze the planning of simulated scenarios in different cultural contexts according to the emotions and expressions found in the texts.

Methods: It was performed: Construction of simulated clinical scenarios in Brazil and Japan; Translation and back-translation of the scenarios; and Analysis of the emotional tones and social styles of the description of the scenarios by the computational tool Tone Analyzer.

Results: In Brazil has a higher frequency of emotions of fear, joy and sadness when compared to Japan. Regarding to social style, Japanese clinical scenario showed that it can be perceived as more rational and systematic.

Conclusion: The description of the scenarios developed in Brazil and Japan brings a difference among the emotional tones and social styles extracted.

Keywords: Clinical Simulation; Cultural Difference; Nursing; Teaching; Artificial Intelligence

Highlights

- Planning the simulated clinical scenario is one of the primary steps for setting the simulated clinical activity.
- Facilitators / teachers from different cultures can reach the same final goal, taking different paths.
- The incorporation of a relatively new technology in health education, such as Artificial Intelligence, can bring significant contributions to the planning and construction of simulated clinical activities.
- Each facilitator / teacher can contribute with several experiences and cultural influences to plan the simulated clinical activity to improve the education.

Introduction

In the teaching and learning environment, increasingly influenced by the acceleration of globalization, it is common to exist apprentices with different beliefs and values, influenced by their cultural characteristics and life experiences [1,2]. Such event is as common as the fact that, in different environments, health professionals assist patients from different cultures. These facts can often occur in Brazil, a continental country, or in Asian countries, for example, due to the ease of local mobility.

The clinical simulation is a learning tool that has the ultimate

purpose of taking the student to a meaningful learning, making possible to experience different health contexts in a safe environment. To achieve this, it is necessary to consider the learners' previous experiences, as well as to explore, in an effective and creative way, all their capacity and senses, thus boosting learning [3]. One of the most important points of health simulation is planning the construction of simulated clinical scenarios, since, when well executed, they can present a good development of the learners' cognitive and affective domains, contributing to the better resourcefulness of students in health units.

Knowing that basic human needs, such as oxygenation, nutrition and elimination, are the same in different cultural contexts and that to meet these needs, nursing students need prior preparation before moving on to clinical practice, it is valid to questioning about the differences in the planning of simulated clinical activity in different cultural contexts whose purpose is to achieve the same learning objective.

Therefore, this study aims to analyze the planning of simulated scenarios in different cultural contexts according to the emotions and expressions found in the texts.

Materials and Methods

This is a descriptive study, conducted through quantitative analyzes of emotional tones and social styles contained in elaborated texts of clinical simulation activity, performed over 2018. The simulated clinical scenario was elaborated in Japan at a private university in Tokyo abd the Brazilian simulated clinical scenario was described in a public university from São Paulo. This study was approved for execution by the Research Ethics Committee of the University

of São Paulo.

To fulfill the objective of this study, three stages were performed, as described below:

Planning and Construction of Simulated Clinical Scenarios in Brazil and Japan

For the construction of clinical scenarios in Brazil and Japan, were invited three specialists with experience in clinical simulation, teachers of the basic area of nursing, who work in teaching and assistance, teaching nursing skills. The experts were selected according to Fehring's criteria [4]. For the specialists in both countries, were given the learning objective, being "To provide nursing care to the patient in acute urinary retention". To standardize the planning and construction of scenarios in both countries, we rely on a script previously constructed by our research group [5] that serves to construct and plan the simulated clinical activity in the context of health education (Figure 1).

The script for the construction of the scenario, which recommends considering the following phases in the planning and construction of the clinical simulation scenario:
1. Previous Components of the Scenario (previous apprenticeship knowledge, the learning objectives, the theoretical foundation of the activity).
2. Preparation of the scenario (fidelity, realism, human and material resources, description and definition of the clues).
3. Final Components of the Scenario (the development of the scenario; the debriefing and; the assessment of the activity and the student) [4].
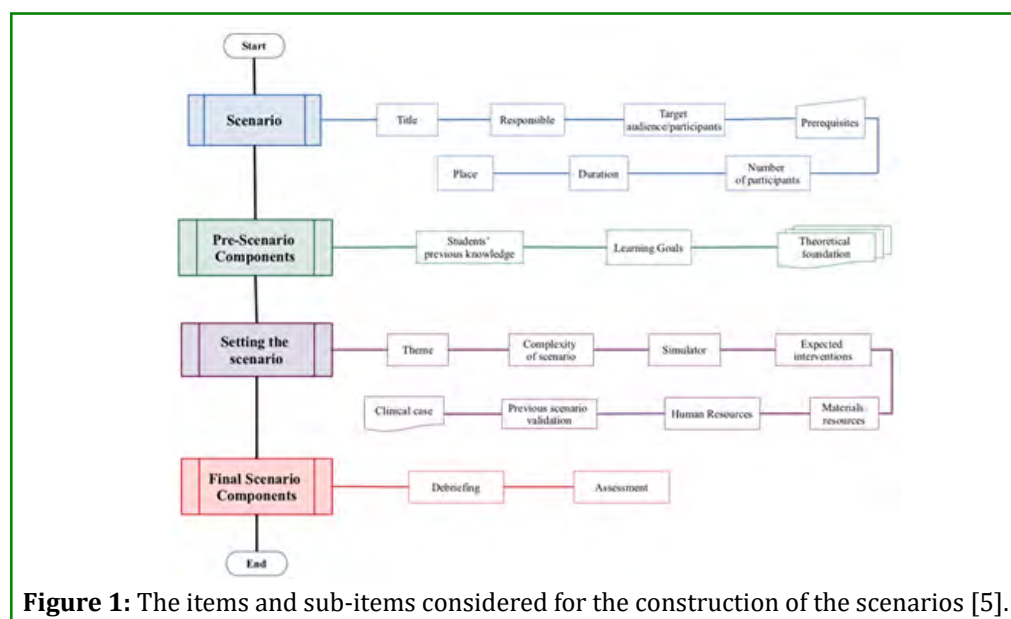

Figure 1: The items and sub-items considered for the construction of the scenarios [5].

Translation and Back-Translation of Scenarios

This translation and back-translation phase was necessary for the next steps, since the software we use to analyze the texts requires the text to be in English.

The scenarios were translated by a Brazilian translator, specialist in clinical simulation, with knowledge of English and Japanese. We followed the recommendation of Ferrer [6] translation process. This translator was responsible for translating the scenario described in Portuguese into English (called BV1) and for translating the Japanese scenario into English (called JV1).

The final versions of the scenarios in English were submitted to the same committee of experts described in the first stage of the method. After its approval, the versions were back translated into their original languages [6]. BV1 and JV1 were back translated into Portuguese and Japanese, consecutively, by two translators fluent in English and Japanese, for checking and comparison to the original version, and then being translated into English by the same translators again, giving rise to BV2 and JV2 versions. There being nothing to correct, BV2 and JV2 were considered adequate for analysis. The final versions of the scenarios can be accessed on "Supplementary Material".

Analysis of Emotional Tones and Social Styles of Description of Scenarios

After obtaining the English version of the described scenarios, the data were compared using a computational textual analysis tool, the Tone Analyzer [7], aiming to verify aspects related to emotions and social styles.

The Tone Analyzer is a high-tech tool that has been used on a large scale in the areas of marketing, technology and information due to its functionality, since it allows the extraction of feelings from texts [8]. In addition, it allows an impartial analysis of emotions and personalities contained in the text by counting and grouping certain types of pre-

determined words according to the definitions contained in tables 1 and 2.

This software uses Natural Language Processing and Artificial Intelligence, being considered as a cognitive system, which purpose is to enable the analysis of documents and texts. The Tone Analyzer focuses on identifying and classifying the emotional, linguistic, and social style contained in the text by assessing the frequency of the words obtained in the text. The standard found in the text is analyzed by the software according to the theory of the psychology field [9-11].

Most of the words defined in this context are based on the dictionary called "Linguistic Inquiry and Word Count" (LIWC) [11] which is used for the purpose of finding psychologically meaningful categories, based on the use of written words. The traditional analytical strategy that employs Natural Language Processing (NLP) establishes a basis for understanding your speech through your vocabulary, even when applied to a superficial linguistic analysis, such as frequency counting. The Tone Analyzer service (US Patent App. No. 15 / 068.753) calculates emotional tones, as well as social style and writing tones.

For a better understanding of the procedure, the two categories (emotional tone and social style of the description of the scenarios) that are analyzed and classified by the Tone Analyzer, receive a certain score according to the classification. A score smaller than 0.50 indicates that there is a low probability that the category is found in the content. Likewise, a score greater than 0.75 indicates a high degree of probability that the category will appear in the text description [7].

For the development of the study, we considered the emotional tone for different types of emotions and feelings that people express (joy, fear, sadness, and anger). Table 1 includes each emotion with a brief description of it [10].

Emotion	Description
Joy	Joy (or happiness) has aspects of pleasure and satisfaction. There is a feeling of well-being, inner peace, love, security, and contentment.
Fear	A response to the imminent danger. It is a survival mechanism for a reaction to some negative stimulus. It can be a mild precaution or an extreme phobia.
Sadness	Indicates a feeling of loss and disadvantage. When a person can be observed in silence, less energetic and withdrawn, it can be inferred that there is sadness.
Rage	Caused by injustice, conflict, humiliation, neglect, or betrayal. If the anger is active, the individual attacks the target, verbally or physically. If anger is passive, the person feels tension and hostility.

Table 1: Emotional Tones from the Tone Analyzer according to their respective descriptions.

The social tone or social style describes the style (analytical, confident or tentative) of what is written in the text. Table 2 shows the styles and the meaning of the text classification [7].

Social Tone	Description
Analytical	Most likely to be perceived as rational, systematic, emotionless, or impersonal.
Confident	Most likely to be perceived as safe, controlled, hopeful or selfish.
Tentative	Most likely to be perceived as questionable, doubtful, debatable, or impersonal.

Table 2: Social Tones from the Tone Analyzer according to their respective descriptions.

Data Analysis

The analysis was performed using SPSS 24.0 for Windows statistical software. The Shapiro-Wilk method was used to verify the adequacy to the normality hypothesis and, therefore, to indicate the use of parametric or non-parametric tests with a 95% confidence interval. In addition, the t-test was performed, which allows greater reliability in data analysis with adequacy to normal distribution. The $p < 0.05$ value was considered significant.

Theory

A successful simulated clinical activity incorporates the construction of planned clinical scenarios, which lead the student to experience a controlled environment as close to reality as possible, releasing cognitive, psychomotor, and affective experiences that contribute to the transfer of knowledge from the classroom to the clinical settings [12].

The systematization of the construction of the simulated scenario is based on the learning objectives outlined and is a facilitator's responsibility [12,13]. The facilitator has the job of building an accessible and stimulating path towards the intended goal, promoting, or hindering the apprentice's way and, indirectly, defining the success or failure of the simulated activity. It is also the creativity, the clinical experience of the facilitator and the appropriate use of resources that transform the learning objectives into a scenario, making it engage, promoting skills and attitudes, and managing sufficient knowledge for its completion, which leaves the learner to become more self-confident and competent [13]. To achieve the success of this process, it is essential to plan and prepare the scenario carefully [14].

In a simulated scenario, it is possible to use resources such as the use of odors and moulages, stimulating the senses to obtain greater realism [15]. This realism brings an experience of immersion in the simulated scenario being developed [16]. The preparation of participants for their development must also be considered, through pre-briefing and debriefing phases [12]. The use of instruments that assess the activity are also relevant [17].

Patients from different cultures, regions and countries, present different socio-economic-demographic experiences and, therefore, require diversified assistance, which respects their values and beliefs, thus ensuring humanized health care [18]. A classic example of the influence of culture on care, may be the different interpretations of the patient "touch" [19].

The simulated clinical scenarios are complex activities and for this reason, their sharing between professionals and institutions has been increasingly encouraged. However, they involve skills, knowledge, attitudes, and emotions with an emphasis on communication, collaborative work, and empathy, being managed differently in different socio-cultural contexts, being based either on the patient's or on the apprentice's culture.

People generally differ considerably from one another, both in their thought patterns and in their feelings or actions. These differences are reflected in what they say, what they think, feel, or do. Researchers in psycholinguistics consider the words used in everyday life as a reflection of who we are, how we feel and how we think. Recent studies have found systematic links between personality and the use of language in a wide range of different contexts, including direct writing assignments [20,21], structured interviews [22], and naturalistic recordings of everyday life [23]. The frequency with which we use certain types of words can provide clues to help infer personality traits, styles of thinking, social connections, and emotional states.

In clinical simulated scenarios, the development of skills and abilities works in different directions. Independently of the learning objective, there will be feelings and behaviors associated with this training sessions, once that there will be an interaction between professional and patient, even in simulated contexts. The relationship stablished in that moment can arouse different impressions on the participants, depending on how the simulation is conducted. In this way, the planning phase is extremely important when talking about the experience that the facilitator wants to promote to the learners. When talking about different cultures, there may be inherent differences between the goals of each facilitator, demonstrating that, maybe, there will be different professional profiles according to the experiences lived in each context [15,16].

Results

The elaboration of the compared scenarios for the analysis of emotional tones and social styles, were carried out through a script for the construction of simulated clinical scenarios [5]. The items and sub-items of the instrument used in the stage of elaboration of each simulated clinical scenario, in both cultures, are represented in Figure 1.

For the analysis of the emotional tones and social styles of the texts, each item and its respective sub-items were paired one by one, in both scenarios. Table 3 shows the average, maximum and minimum values of Emotional and Social Tones' frequencies found in the descriptive document for both scenarios.

Brazil							
	Emotional Tones				**Social Tones**		
	Anger	**Fear**	**Joy**	**Sadness**	**Analytical**	**Confident**	**Attempt**
Maximum	0	0.64	0.87	0.64	0.96	0.78	0.79
Minimum	0	0.64	0.75	0.6	0.53	0.75	0.57
Average	0	0.64	0.57	0.62	0.81	0.76	0.66
Japan							
	Anger	**Fear**	**Joy**	**Sadness**	**Analytical**	**Confident**	**Attempt**
Maximum	0	0	0.6	0.6	0.97	0.93	0.53
Minimum	0	0	0.57	0.6	0.58	0.54	0.53
Average	0	0	0.55	0.6	0.84	0.7	0.53

Table 3: Frequency of emotional tones and social styles in the simulated clinical settings from Brazil and Japan.

The results of the emotional tones and social styles found are shown in Figure 2, which presents the Boxplots* for the classifications performed by the Tone Analyzer algorithm.
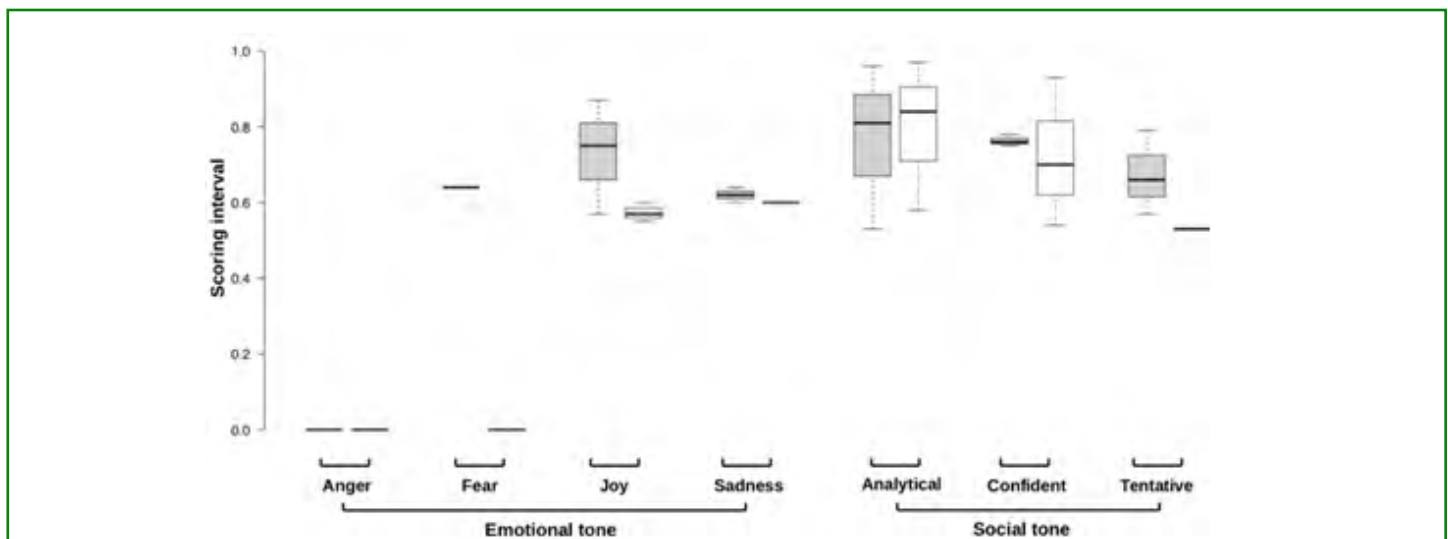

Figure 2: Distribution of Emotional and Social Tones of the scenarios using Boxplots for the classifications performed by the Tom Analyzer algorithm.
Footnote: * The Boxplot, or box diagram, is a graph that captures important aspects of a data set through its summary of the five numbers, formed by the following values: minimum value, first quartile, second quartile, third quartile and maximum value.
Legend: Grey or left side of each distribution of results is the Brazilian scenario and White or right side of each distribution is the scenario of Japan

Figure 3 illustrates the Emotional tones and social styles' means found of the main items considered for planning and preparing the description of the simulated clinical activities in both countries, being these: (1) scenario; (2) pre-scenario components; (3) scenario settings; and (4) final components of the scenario.
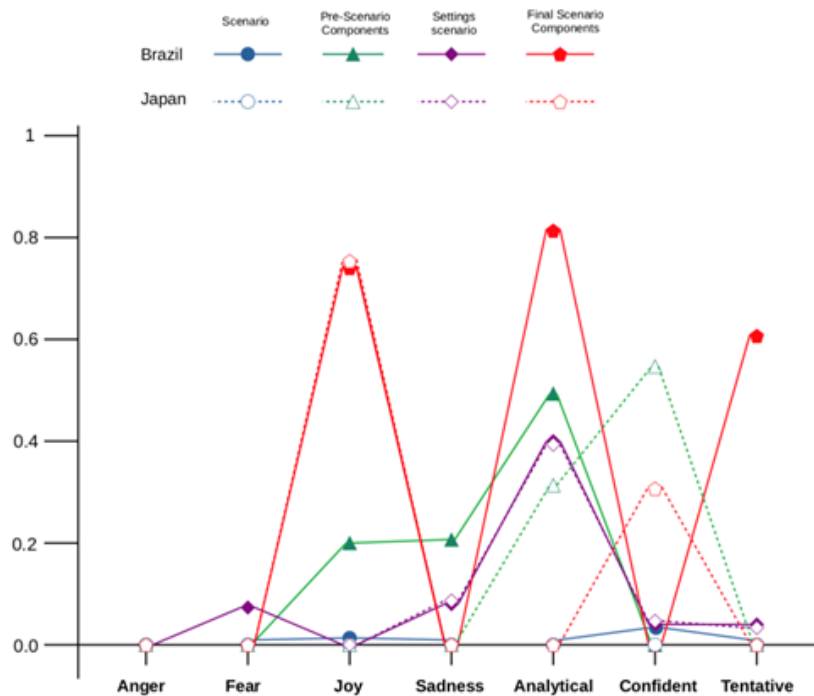
Figure 3: Distribution of emotional tones and social styles' means associated to the main items of the script for planning and preparing the simulated clinical scenario.

Subsequently, statistical analyzes were conducted to validate the results. Initially, the Shapiro-Wilk ** method was used. The Shapiro-Wilk test is a general test designed to detect all deviations from normality. The test rejects the hypothesis of normality when the p-value is less than or equal to 0.05. Failing the normality test allows you to state, with 95% confidence, that the data does not fit the normal distribution. Passing the normality test only allows you to declare that no significant deviation from normality has been found. As all p-values obtained are greater than 0.05 (Table 4), we accepted the hypothesis of normality.

	Brazil (*p*-values)	Japan (*p*-values)
Rage	–	–
Fear	–	–
Joy	5,37E+07	2,01E+06
Sadness	1,98E+05	2,69E+05
Analytical	5,23E+09	2,01E+08
Confident	1,91E+06	6,29E+07
Tentative	1,25E+07	2,69E+05

Table 4: Comparison of value between the scenarios form Brazil and Japan on both Emotional and Social Tones, according to the Shapiro-Wilk test.

For the parametric test, we used the T-test. The T-test is a hypothesis test that uses statistical concepts to reject or not a null hypothesis. This premise is normally used when the test statistic follows a normal distribution. Paired comparisons made with the t-test are shown in Table 5 and values smaller than $p < 0.05$ indicate a statistically significant difference between the groups of results.

Emotional tones and social styles	p-values
Rage	–
Fear	0.32
Joy	0.26
Sadness	0.54
Analytical	0.39
Confident	0.44
Tentative	0.23

Table 5: Comparison of value between the scenarios form Brazil and Japan on both Emotional and Social Tones, according to the T-test.

The p-values indicate that the groups of results, that is, the descriptive documents of the scenarios in Japan and Brazil, do not exhibit a statistically significant difference, which demonstrates the equality in the description of the scenarios

in relation to the emotional tone and social style between the participants. However, there is a difference in the distribution of emotional and social tones between the Brazilian scenario and the Japanese scenario, as shown in Figures 2 and 3.

Discussion

This is one of the first articles that uses artificial intelligence to analyze a simulated clinical scenario in a health education field, described in different cultures to identify components that can contribute to strategy planning.

The importance of simulated clinical activity for achieving self-confidence and learning satisfaction has been increasingly elucidated [24], for gains in practical skills, in the development of necessary reasoning and in decision-making [25].

In this investigation through scenarios applied in Brazil and Japan, following the global trend of using simulation to train health professionals, in a complementary way to clinical practice, there is evidence about the acquisition of techniques through practice on both countries investigated [26.27], complementing studies addressing issues of teamwork, as well as communication, trust and the satisfaction of apprentices, which have shown positive results in both cultures [28-31].

The results demonstrate that Artificial Intelligence, as a method of analysis, can be established as a relevant strategy, in the appraisal of apprentices in clinical simulation activities, since this method performs an assessment in a more objective way and makes it possible to compare other types of assessment tools [32,33].

The construction of scenarios, both in Western and Eastern cultures, does not bring significant statistical differences on the emotional and social tones (Table 5), when compared between them, which is consistent with the learning objective, as it is the same on both scenarios. However, the Boxplot graphics of the scenarios in the two cultures brings a difference between the emotional tones and social styles extracted from the clinical scenarios developed in both countries (Figure 2), which may be due to the small sample used on the analyzes.

The process of regulating emotions can differ from one culture to another, as observed on the graphics obtained, according to the way individuals experience and internalize emotions, as well as the way they express themselves in social interactions [34].

According to the literature, the expression and interpretation of Westerners' emotions has differed from Easterners

[35], that is, there is a variation in the emotional response in these two contexts, as found in our results. There are reports that countries in the west (USA and Canada) and in the east (China, Korea and Japan) can provide contrasting cultures, differing in values about emotions and emotional control [36]. A study [35] that analyzes the literature from the perspective of comparing the regulation of emotions of Westerners and Asians, showed a concordance between the evidence found that Western culture has less suppression of emotions when compared to Asian. This demonstrates that Western culture is more related to the emphasis on independence and self-expression in order to demonstrate more their emotions, through verbal and / or non-verbal expressions (eg facial, gestural or verbal expression), while Asians have a sense with an emphasis on interdependence and value interpersonal harmony. Thus, as found in the results of this study, the general average of emotions (Figure 2) were more evident in the Brazilian scenario (West) than in the Japanese scenario (East/Asia).

The data also show a different distribution in the social styles presented in both countries. When it is observed for the social styles of each item of the scenario description (Figure 3), in "final components of the scenario" of the Brazilian scenario, there is a greater frequency of the analytical style, that is, the description of the sub-items contained therein ("debriefing" and "scenario assessment") tends to be carried out in a more rational and systematic way. In the Japanese scenario, this same item mentioned presented higher frequencies in the confidant style, that is, the description of the assessment topics is carried out in a manner considered safe, controlled and hopeful. However, in the general average of frequencies (Figure 2), the opposite of what was observed in each item occurs, with the Analytical tone being higher in the Japanese scenario, while in Brazil, the Confident and Tentative averages were higher.

Thus, according to the definitions used in this study, studies show that Asiatic people tend to be more rational and systematized, as in the social style of the description of the simulated clinical scenario. The social styles of Westerners, by its turn, tend to be perceived, according to the descriptions, as controlled, hopeful, selfish, questionable, doubtful, debatable, or impersonal.

Figure 3 also shows that the item "final component of the scenario" presents an almost equal distribution of the emotional tone - joy in both countries. However, higher frequencies of emotions such as fear, joy and sadness were observed in the items "scenario settings" and "previous scenario components" in the scenario in Brazil. Such emotions presented can be explained by the sub-items contained in "scenario configurations" ("interventions expected from apprentices", "clinical case of the scenario" and "material

resources to be used for the execution of the scenario"), since they tend to be described according to the cultural and / or local influences of each facilitator.

In health care spaces, respect for the patient's feelings, emotions, culture and territory, demonstrated in non-verbal interaction with professionals, have been a concern of professionals [37], thus being the object of studies of apprentices in training.

A review [2], when analyzing studies that assess the levels of empathy of medical students from different cultures, showed that westerner's side have a higher level of empathy when compared to Oriental's in the initial periods of their training. However, it was observed that the maintenance or even an increase in the level of empathy throughout the training of students occurs only in Eastern culture, while in Western culture there is a decline in the level of this skill during the training of students. In addition, gender differences, choice of specialties and personalities also influence students' levels of empathy [38]. Therefore, in the context of health, there is a concern to investigate how culture can influence teaching. The holistic and humanized treatment of patients are necessary in any situation or cultural context [18].

However, as seen in this study, the elaboration of simulated clinical scenarios in different countries, even with the same teaching-learning objective, showed differences in the elaboration and description of both, about emotions and social tones, which is possibly due to the culture of the individual who described the scenario.

Thus, it is observed that facilitators from different cultures can describe simulated scenarios differently. The construction of the scenario, in this way, aggregates the values arising from each context, even if unconsciously, perpetuating the culture of local care and the dogmas of the facilitator, whether in a positive or negative way. However, if the learning objectives and resources are the same, and if above all it is necessary to maintain the principle of individuality in the training of professionals, and respect for the patient, with a view to their comfort, bioethical, independent, and individualized care; we question whether this process is effective.

We highlight here, as found in the Boxplot tests, that the limitations of this study may be related to the small number of analyzed scenarios. The analysis of more simulated clinical scenarios described in the cultural contexts of this study could bring more robustness, being able to confirm the results demonstrated here. In addition, despite having systematized and carefully translated the scenarios into English by experts in the language, there may be a possible bias in the analysis of word frequency. However, the results obtained emphasize the positive potential that tools based on Artificial Intelligence can play in the assessment and validation criteria of simulated clinical scenarios before their application to apprentices.

Conclusions

The description of the scenarios developed in Brazil and Japan brings a difference among the emotional tones and social styles extracted from them. In this way, it was evidenced that, even with the use of the same script for the construction and planning of scenarios, clinical simulation is not restricted to just one reality, since the cultural differences experienced in both countries are evidenced by the awakened tones, both emotional and social. Thus, the use of Artificial Intelligence may be useful when planning effective education strategies in health contexts, making it possible to build specific scenarios for each context, awakening or minimizing certain characteristics, as objectified by the teacher / facilitator.

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Declarations of interest

None

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