

Quality in health care: A systematic literature review applied to hospital care

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Abstract

Since the begging of humankind, several authors have tried to define and quantify health care quality. However, there is no consensus since there are multiple perspectives and different social-economic situations. A few articles were found regarding this matter, but most are outdated or focus on different topics such as types of hospitals, technologies, services, etc. Considering this, a literature review was done using the PRISMA methodology, to understand how authors quantify hospital quality and fulfill the current literature gap. More than 32 thousand articles were found, but only 66 were selected and posteriorly analyzed. This data provided a better understanding of the trends between dimensions, measures and surveys used, and the correlations between the most used dimensions in each country, the way health care is financed, and the development of each country. Analyzing the articles showed a clear interest in quantifying quality based on the services, especially using the SERVQUAL framework. In addition, a total of 50 different dimensions and 650 measures were found in the articles, however, just a few had a high rate of use. Finally, another conclusion is the necessity of different dimensions depending on the country's development, which does not happen when considering how health care is financed. The main conclusions demonstrate the difficulty of a general acceptance of what quality in health care should be. The first step should be to uniformize the existing dimensions and measures since some are very similar, and most of them can cause some overwhelm.

Keywords: Hospital quality, Health care, Systematic review, PRISMA, Meta-analysis

1. Introduction

Over the years, health care has become more present nowadays mainly due to the tremendous impact observed in people's lives. It is proven that there is a direct proportionality between health care innovation and the increasing average life expectancy of the population (President United States and Council of Economic Advisers, 2008). Bearing this in mind, governments are becoming more aware of the importance of improving health since they believe it is crucial to have a more sustainable long-term development of the economy and societies. Thus they are raising their efforts to increase human health, affordability of access, and the quality in health care provided (Gurría, 2008).

Although there is countless awareness regarding the importance of this topic, various organizations and individuals fail when trying to define and quantify it, since it is a very complex process, and many opinions misalign with each other. This complexity arises mainly from a critical factor: each individual/organization has different visions and objectives of what hospital quality should be. This idea can

be corroborated by Nylenna et al. (2015), Kapoor (2011), and Pilgrimienė and Buciuniene (2008), as they define the existence of three different perspectives, namely the perspective of the patient, health professionals, and hospital managers. In addition, the complexity increases when considering different dimensions that aim to help define/quantify quality. These dimensions increase the complexity of the process, since there are a panoply of dimensions that are similar and each author uses what they think makes the most sense in the situation. In conclusion, these conflicts make this whole process uncertain, and the existence of a universally accepted definition is far from being consider.

After a long research, it was noted that there is a lack of literature regarding the measurements of quality in health care hospitals. The articles published related to this topic are outdated and do not express the needs and interests of today. Besides that, all they are starting to deviate and converging into more specific topics, concentrating more on hospital departments, diseases, levels of each hospital, etc. Beyond this problem, Machado et al.

(2013) and Simou et al. (2015) also mentioned that creating a universally accepted framework is a challenge since it depends on the scope and motivation of health professionals, the challenges of the data sources used, the increase in the amount of performance indicators, and methodological concerns.

That said, the objective of this dissertation is to fill the literature gap, collecting all the articles that try to quantify hospital quality and do a literature review about it. This helps understand which measures/dimensions authors use and understand if there are correlations with other factors, such as the countries that have more interest in this topic, the type of financing the health care, the development of the country as the surveys used, and so on.

It is also fundamental to clarify the two main questions of this dissertation: 1) what are the dimensions and measures most used by authors to quantify quality? 2) Is there any consensus regarding the dimensions/ measures used? Besides these questions, one hypothesis that needs to be validated that some authors corroborate is the existence of any correlation between the dimensions used and the socio-economic situation of a country.

2. Background

2.1. Perspectives

Over the years, quality in health care has been increasingly studied, and various individuals/ organizations are trying to define and quantify it. However, it has not been an easy process since several conflicts arise, reflecting the inexistence of a definition that is universally accepted. Nevertheless, they all present criteria that may have different weights depending on the existing perspectives. Having that said, there are three different perspectives according to Kapoor (2011), Nylenna et al. (2015) and Piligrimienė and Buciuviene (2008):

- Patients and their relatives;
- Health care professionals;
- Health care managers.

On top of that, Nylenna et al. (2015) wrote that it is fundamental to notice that each perspective can be applied to each level of care, and each perspective is related to roles and stakeholders.

Concerning what patient values, Kapoor (2011) claims that this point of view is critical to make changes regarding what is provided and how. This believes surge since they are the only source of information able to expose if treatments are being done with respect and dignity. They also state that patients will tend to value the accessibility delivered, affordability of health care, and how they are treated. Piligrimienė and Buciuviene (2008) highlights that patients also recognize quality regarding the results – recovery, mortality, and functional

status. When it comes to health care professionals, Blumenthal (1996) and Donabedian (1988) mention that the most valued characteristics are the results of care provided, the technical excellence (doing the right thing right and the interactions between the provider and the patient), the existence of trust between them and the patients, good communication, and the possibility to treat patients with dignity, privacy, honesty, empathy, tact, and sensitivity. Finally, Nylenna et al. (2015) recognized that managers are more concerned about allocating resources, having more efficiency, and increasing the sustainability of education, the economy, and research.

Piligrimienė and Buciuviene (2008) made an interesting comment saying that managers and patients may have more similarities since they focus more on functionality attributes, unlike professionals who focus on technical attributes. As we can conclude, different attributes are valued and prioritized for each perspective, making the standardization process complex and questionable for many.

2.2. Dimensions

In addition of having several perspectives, it is noted that for each definition, several dimensions are brought up. The main issue with the dimensions is the fact that there is not an universal selection of what should be considered, and authors choose what they think are the most important ones. This issues happen because knowing which dimensions should be chosen becomes complicated as they depend on the definition chosen, the perspective, and the time this issue is brought up. Suppose we are in a situation of calamity. In that case, it is expected that an important topic will be the accessibility of health care, as opposed to a situation where health care is practically taken for granted. As a result, several characteristics or attributes are brought up, leading to an extensive list of dimensions - some of them can be quantified, and others are unmeasurable- leading to enormous complexity.

Despite all these obstacles, some individuals/organizations have taken a step forward to clarify this issue. This topic began to be addressed by Donabedian (1990) when in 1990, he published a list of seven well-known pillars that he considered important. Those pillars are: Efficacy, Effectiveness, Efficiency, Optimality, Acceptability, Legitimacy, and Equity.

Then, several proposals were presented over time, and specific dimensions are starting to become recurrent such as efficiency, equity, patient-center, safety, and effectiveness. However, some of them can be considered health system performance, which makes this process even more complicated to define as there is a fine line between quality and

performance (Busse et al., 2019).

In addition, another problem is the fact that there are a huge amount of different dimensions, and they can have different values for each organization. Finally, Nylenna et al. (2015) stated that Donabedian made an interesting comment saying there is no correct answer about which dimensions to consider since it depends on the definition chosen to define quality, the dimensions that have a relevant impact, and how they are going to be operationalized.

2.3. Measures

One of the biggest questions related to quality in health care is how we can measure and quantify it. This is a very important topic since several advantages can be brought up if we could solve this issue. They are able to do comparisons between hospitals and countries; understand if development was made over the years leading to an improvement in quality; Able regulation, accreditation, supervision, and report of what is being done; Implement the best tactics or strategies in the service; Better allocation of funds or investments; Comprehend what services need to be reevaluated.

It is essential to use indicators while quantifying quality in health care because according to the Cambridge One of the main challenges in measuring quality is deciding which indicators need to be considered. These indicators depend on several factors, such as the different perspectives, the purpose of the study, the definition of quality chosen, the level of the health care system, etc.

Despite all these contradictions, Donabedian tried to classify the measures into three types: structure, process, and outcome. However, it is essential to mention that besides having these three types, none of them is more important than the other, having a non-hierarchy (Adirim et al., 2017). Until 2019, Endeshaw (2020) highlights that five main models have been identified to measure the health care quality services/processes: Donabedian's model, SERVQUAL, HEALTHQUAL, PubHosQual, and HospitalQual. In addition to the five models mentioned, many others were created, and some of them are based on these five models. This array of methods occurs for several reasons, which may be due to the purpose of the research as well as the place where the research will be carried out. If methods are created in different environments to where they will be used, some things will fail. This way, since the realities are not homogeneous, it becomes almost impossible to have a universal method for all countries, services, etc.

3. Methods

3.1. Search Strategy

For this systematic review it will be used the PRISMA methodology. Concerning the Information sources and Search strategy, the systematic review is going to be based on the consultation of the Scopus database with the following keywords: TITLE-ABS-KEY (Hospital AND (quality OR health care quality) AND (dimensions OR measures)). The selection of the keywords was established on finding the best arrangement of words that would not miss some of the literature and best relate to the dissertation topic. Considering this, the research was conducted on August 5th, 2022, to collect all articles based on the search strategies.

3.2. Inclusion criteria

For the inclusion criteria the articles needed to be published between 2000 and 2022 in order to be as complete as possible, they needed to be written in English, be an article in the final publication stage, and finally, their source needed to be a journal. The articles excluded were Reviews, conference papers, notes, editorials, book chapters, letters, short surveys, conference reviews, books, erratum, retracted, data papers, and undefined since some do not peer review processes and may contain incorrect information. Besides that, it is important to notice that the only articles included must be related to the measurement of the quality of standardized hospitals, excluding more specific ones like military, university, home care, and primary care, and besides that can not be related to single departments of the hospitals, specialties, diseases, and procedures. Having that said, the articles must present all the dimensions/ measures that they consider relevant to measure general hospital quality.

3.3. PRISMA checklist

The total number of articles found, just using the keywords, was 35 305 articles, and when using the eligibilities criteria, this number was reduced to 25 587, which is less than 9 718 articles to screen (see figure 1). After collecting all the remaining articles, a selection was made which the first step was screening all the titles. That said, 24 959 reviews were removed, leaving only 628 articles to be screened based on the abstract. After the abstract screening, the number of articles suffered a reduction of 520, with only 108 left. After these vast exclusions, the next step was screening based on the complete text, where it was necessary to download all the remaining articles and see if they were accessible to the public and compatible with the eligibility criteria. Based on this, 66 articles passed all the screening, where 42 were excluded for several reasons: no availability (13), not related to general hospitals, and instead focused on cirugies departments,

in-hospitals, QI-teams, primary hospitals, nurse facilities, governmental hospitals and Medicare beneficiaries (10), do not refer the proper dimensions/ measures to use (18), and finally do not focus on quality (1). To make all the decisions previously made, easier to visualize and be more perceptible, the entire screening is represented in Figure 1 in the PRISMA diagram flow.

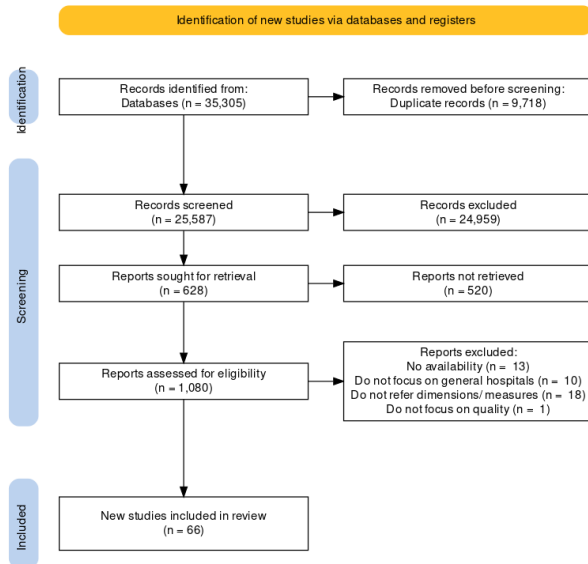


Figure 1: PRISMA checklist

4. Results

4.1. Data overview

After doing an analysis of all the articles passed through PRISMA it was noted that the majority of articles studied quality during one year and the average of the sample was 13,750 participants and 913 hospitals. Another conclusion found is the number of dimensions and measures that authors considered. Most authors unanimously consider that quality should be measured using four to five dimensions and between 20 to 22 measures.

4.2. Articles published during the years

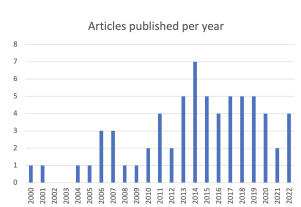


Figure 2: Frequency of articles published during the year

The first critical analysis that was made is the frequency of articles that have been published over the years (see figure 2). It was denoted a percentage growth rate of approximately 43% between

each year from 2000 to 2014 and from the latter year, the number of publication started to become increasingly constant (approximately five articles per year). A note that should be given regarding why the number of articles is primarily constant after 2013 is that the authors started to increasingly specify the measurements of hospital environments. Since they specify, they were not considered in this literature review. Thus, although this value does not increase over the years, it does not imply that there are no concerns about this subject, there is only an increase in less generalized concerns, such as focusing more on more specific departments or hospitals.

Finally, 2021 was the most recent year that had a sharp drop of articles published, however, this is the perfect example of more articles starting to specialize the quality measurement. This reduction happened for two main reasons: two articles were not available (despite the abstract give the idea that could be pretty remarkable and that it would give a considerable contribution), and three articles were more focused on departments/hospital types.

4.3. Measures, dimensions and countries

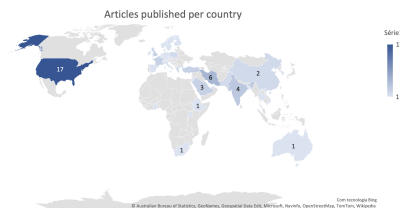


Figure 3: Frequency of articles published per country

Before starting to carry out more in-depth analyses, it is necessary to have an overview of the dimensions and measures used by the authors, as well as the countries that have hospital quality as a concern (see figure 3). A total of 54 different dimensions and 649 measures were founded, through the number of publications, we can see that only a percentage of countries are concerned with the measurement of hospital care, with approximately a quarter of the articles coming from the United States, with 17 articles published. The rest of the countries had published between seven to one article until now. In short, it can be seen that despite having found 66 articles on the subject, there is not a great dispersion in terms of countries' concerns.

4.4. Most surveys and methodologies used

While reading the articles, it was observed that there are indeed authors who use surveys to quantify what they consider to be quality (see figure 4). We realized that 17 different surveys were used,

of which only four stand out, as is the case of SERVQUAL, which leads with 12 uses. Then we have surveys based on SERVQUAL with six uses and finally, the HCAHPS and the HSOPSC with three uses. Clearly, there is great acceptance of the SERVQUAL survey and surveys based on it, which in total the two surveys represent 48% of published articles. Another relevant analysis is that 56% of published articles use surveys, most likely because of their practicality since they define which measures should be used to quantify hospital processes that is directly correlated to hospital quality. This percentage shows the need to have standard and universal measures to facilitate the quantification of hospital quality and not deviate according to the authors' interests.

Another analysis that is considered relevant is to understand how the authors aggregate the dimensions used to understand if there is any universal methodology used. After doing an frequency analysis, approximately 70% of the authors preferred to associate equal weights for all dimensions. That is, they defined that all dimensions have the same importance and impact on quality. This philosophy has both positive and negative aspects, and it is necessary to understand that the fact that weights are associated with dimensions leads to an increase in bias. One of the examples is the fact that for the same perspective, as in the example of patients, they give different weights to each dimension. There is a high probability that some patients give more value to some dimensions than others, making universality more difficult.

Regarding the authors who gave weight to the dimensions no method stood out since no method had a frequency greater than 1. Thus, it is concluded that if there is any measure to quantify the quality, it is necessary to pay attention to the weights given by the dimensions. There is no consensus on whether to choose to give different weights to each dimension for the reasons mentioned, and most authors who wanted to aggregate dimensions wanted to give equal weights.

In short, this subchapter reported that there is a great propensity on the part of authors to use surveys being SERVQUAL the most used, and in addition, the authors prefer not to give weight to dimensions.

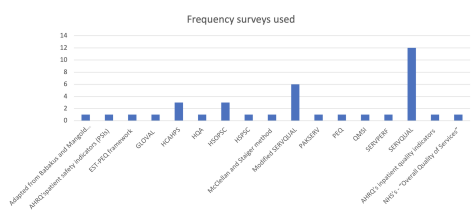


Figure 4: Frequency of surveys used

4.5. Most dimensions and measures used

Due to the high number of dimensions and measures, it is difficult to make extensive and understandable analyses. This way, only the top 10 dimensions and the top 5 measures most used were taken into consideration. That said, the ten dimensions with the highest frequency considered were: Tangible, Assurance, Outcomes, Reliability, Empathy, Responsiveness, Human Resources, Safety, Process, and Patient-centered (see figure 5). It did not make sense to go beyond the ten dimensions, since the remaining ones present between 3 to 1 uses by the authors, being a relatively low value when the sample is 66 articles.

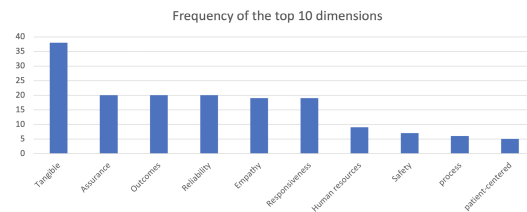


Figure 5: Frequency of top 10 dimensions

Analysing the top 10 dimensions it was noted that the tangible dimension was used in approximately 58% of the articles, which makes it a very common dimension and probably the dimension that needs to be take into account, since it can have a great impact on quality. Another level found refers to the five dimensions – Assurance, outcomes, Reliability, Empathy and Responsiveness – which have practically the same frequency and were found in approximately 30% of the articles. Also, it is possible to consider that these dimensions are widely used despite of not having the same high frequency as the tangible one. The remaining dimensions present a percentage between 13% and 7% relative to the number of occurrences of the articles. These values are already relatively low, which demonstrates a certain lack of consensus about what dimensions should be used to quantifying the quality of the hospitals.

After analysing the top 10 dimensions, another analysis was carried out but focusing on the measures that were used at least seven times. This number was chosen because it represents a minimum of 10% usage in all 66 articles. Unlike the dimensions, the differences between the measures are not abrupt, especially when the frequency of use is less than 17. Adding this information with the fact that the variation in the use of each measure varies between 10% and 40% , we realize that there are no consensual measures, since less than half of the articles use them. Observing the five most used measures, we can see that the measures that were

most taken into account and that the authors think it makes sense to add in the quality quantification were those related to the neatness of the professionals, followed by the reliability of the hospital, the facilities, the equipment used and the environment

The subsequent analysis that was important to do is for each of the ten most used dimensions mentioned above define which are the five most used measures and if there is any consensus among authors. That said, several pie charts were made for each dimension to make it easier to see if there is any measure with a high frequency for each dimension. One note is that the word “others” includes all the remaining measures of each dimension.

After analyzing all the graphs for each dimension, we realize that there are typically two scenarios:

1. Dimensions with practically unanimous measures by the authors - These measures are characterized by the fact that the “others” component is relatively small. This indicates that the five most used dimensions have a significant expression/weight, making it virtually unanimous among the authors that these are fundamental measures to calculate the dimension.

- Empathy and Processes – these two dimensions have five unanimous measures, since all the other measures together have practically the same weight as each of these 5. This is the typical case where the five measures are considered fundamental to calculate dimension;
- Assurance and Tangible – In these dimensions there are four measures that present a great expression and can be considered fundamental. However the expression of “others” is relatively large comparing to the 5th measure that does not present the same expression as the others four most used measures;
- Outcomes- Although the section “others” have a great expression, this dimension presents two measures that are pretty used that together constitute 48% of the set;
- Reliability and Responsiveness– These two dimensions present measures with some expression, however, there is a panoply of measures that need to be considered.

2. Dimensions that are not unanimously measured by the authors - These dimensions are characterized by the great expression of the others component and the small weight of the five most frequent measures. These measures

generally have a panoply of measures, each with a low frequency.

- Human resources, safety and patient-centered- Unlike the dimensions already mentioned, these three dimensions do not have measures with great weight. The “others” have more than 50% of the total weight, and all the other measures do not have a great expressiveness, however, each one of them presents the same weight.

Another analysis that can be done is to analyze the dimensions that were most used over the years to see if there is any repeatability and correlations. One of the first conclusions that can be drawn is that there are dimensions that are repeated and generally come together every year, such as the Tangible, Reliability, Assurance, Empathy and Responsiveness dimensions. From what we can observe, the authors consider them to be relevant dimensions to measure quality since they are unanimous over the years. The opposite is true for Processes, Human resources and Patient-centered, since despite being widely used dimensions, they only had a high expression in a short period of time. Another conclusion that can be drawn is the increase in the expressiveness of the Outcomes and Safety dimensions, which ten years ago did not have any kind of expressiveness and is increasingly emerging and becoming more used by the authors.

This analysis is quite interesting, since it expresses that over the years the interests and weight that individuals give to the respective dimensions can differ.

4.6. Economy and type of health systems of each country of study

The first analysis based on the economic situation of each country, where based on developed and developing countries. This characterization was based on Department of Economic and Social Affairs (2022) and was based on the GDP of each country.

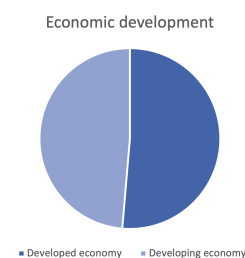


Figure 6: Frequency of articles published in developed and developing countries

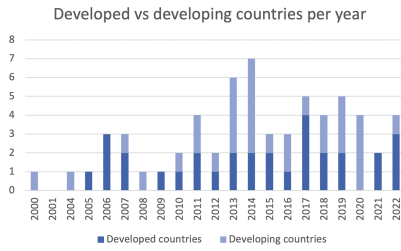


Figure 7: Frequency of articles published in developed and developing countries per year

Based on S (2020), we can characterize a developed country as a country with high availability of resources and health care is assured with the best treatments. On the opposite side, S (2020) characterized a developing country as a third-world country where literacy, education, transport rates are low, the medical facilities are not good and the mortality rate, birth rate, and malnutrition rate are extremely high. To corroborate this idea, Peters et al. (2008) also mentions that there is a lack of access by the population to obtain health care, the general quality and acceptability is low

Taking these characteristics into account, two macro analyses were carried out (see figure 6 and figure 7). The first analysis will specify the frequency of articles published regarding the developed and developing countries for each year, and the frequency of dimensions used by each of these countries.

We can conclude that the number of published articles did not vary depending on the type of country, as 19 articles published were from developed countries and 18 were from developing countries. Nonetheless, this analysis can not give a huge amount of information, so a more detailed analysis was carried out. Although the number of published articles is practically the same, their dispersion over time is relatively different. The distribution of articles of the developed countries are relatively uniform over time, unlike the developing countries that have more exposure from 2013 onwards. This provision may indicate a growing predisposition of developing countries to want to change the quality of hospitals, realizing their shortcomings, unlike developed countries, which show a particular concern from a very early age.

In addition, as mentioned, an analysis was carried out in order to understand whether there are differences between the most used dimensions between the two types of countries. Thus, after doing an extensive analysis, it was noticed a large discrepancy in the dimensions used. One conclusion we can reach is that developed countries have fewer dimensions needed to quantify quality of hospitals compared to developing countries. Most likely, it will

be because the developed countries already have several situations/equipment/medicines/conditions considered basic, unlike the developing countries which may not be considered guaranteed. Thus, this data is important because it reflects the difficulty of universalizing hospital quality, since the needs are different for each situation.

The second macro analysis that was carried out is related to the type of health care system in each country and whether it has an influence on the dimensions considered (see figure 8). Thus, for each country, the form of financing of the health system was associated. Nevertheless, first, according to Columbia University Irving Medical Center (n.d.), Vera Whole Health (2020), World Economic Forum (2020), and OECD (2021)), there are four types of health systems: Beveridge model, Bismarck model, National health insurance model, and Out-of-pocket model. In addition to these four dimensions, another form of financing was created, named private health insurance, which is integrated in the US. This happens because United States does not have a specific model, as shown in OECD (2021), where 35% of these countries use the voluntary health system, another 23% use the beverage model, 27% use the out-of-pocket, etc. As we can see, there is no model that stands out and therefore cannot be included in the four models mentioned.

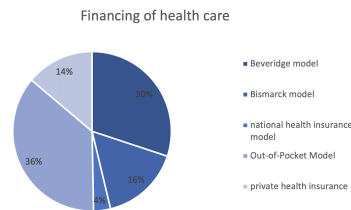


Figure 8: Frequency of articles published by type of health care financing

Bearing this in mind, the first analysis that was made refers to each country/financing model's interest in quantifying hospital quality. In this way, a frequentist analysis was used to determine the weight each model has in the publication of articles. It was concluded that few articles are published by countries with a National health insurance model, which could indicate a lack of interest in promoting the idea of hospital quality. However, this idea is annihilated from the moment when two of the three countries that present this model are in the top 2 of countries with the best health system, according to (Ireland, 2021). In this way, another theory can be formulated: the worse the health system, the greater the interest in this matter. This theory can be corroborated, since the countries that study this subject the most have an out-of-pocket

model, with a percentage of 36%. This model, as already mentioned, is not the best alternative for the population as it is not accessible to everyone. In this way, there may be an increase on the part of the population/government wanting to circumvent this situation, leading to a growing interest in these matters. The example of Vietnam can be given, where the government has been trying to expand the use of social health insurance since 1992, with the aim of financing the poorest groups, minorities, children and the elderly (Ahmed et al., 2015).

Finally, the last analysis that is considered necessary is to understand which five dimensions are most used by each model. It was noticed that there are almost four dimensions in common with all the models: Assurance, Tangible, Empathy and Responsiveness. Thus, we can conclude that regardless of the type of model, economic situation, availability of resources and facilities, the general population considers these 4 dimensions important to quantify hospital quality.

5. Conclusions

5.1. Conclusions

After doing an intensive research two problems were found. The first problem was met when we tried to define and quantify health care quality. What was most felt is that a wide range of institutions and individuals published what they think health care quality should be. Since all of them have different points of view, so there is no consensus between them. Besides that, it was found three different points of view that can change the definition of health care quality: patients, health professionals, and health care managers. Since each of the three stakeholders has different goals, values, and priorities, it is expected that there are different interests and, therefore, different visions of what quality should be. In addition to these conflicts, since the world is not homogeneous, it becomes complicated to have the same ideology in which all individuals/organizations have the same interests regarding the dimensions/ measures to use, since the socio-economic and environmental environments are different.

The second problem was found when we tried to define the dimensions and measures used to quantify hospital quality. It was noticed that there is a lack of studies that compile all the articles that try to measure hospital quality, not allowing to have an overview of what has been studied over the years and what has been considered. Thus, a literature review was carried out using the PRISMA method, to understand what dimensions and measures are used to monitor the quality of hospitals. After an extensive analysis over that 35000 articles, 66 articles were screened and ready to do a full text analysis where several conclusions were made.

The first conclusion was made based on taking an overview of the articles published during the years. Until 2013 it was seen an increased of publications, however after that year this number stagnated. This does not fully reflect the lack of interest in this topic, since what has happened is that authors are increasingly focusing on specific quality issues such as measuring quality in surgical departments, in-hospitals, IQ teams, primary hospitals, nurse facilities, governmental hospitals and Medicare beneficiaries, which is not the focus of the theme. It is also important to mention that the most recent articles appeared to be very relevant to this thesis. However, many of them were not available for reading. In this way, the articles based on this topic continue to be published and that there are no prospects of slowing down.

Then it was noticed a huge interest of using surveys to quantify quality (53%). This percentage can either indicate three things: authors prefer to use predefined dimensions/measures so that it is easier and more practical; they tried to make their article more universal since many authors use these surveys; and associating quality only with services/process (disregarding the other two types of measures defined by Donabedian- structure and the outcome). Another important conclusion is the fact that only 1% of articles that use surveys do not use the SERVQUAL survey or a modified survey based on SERVQUAL. In this way, there is a clear interest and acceptance on the part of the authors in quantifying quality according to the dimensions and measures indicated by this survey. Finally, it was also understood that 70% prefers to aggregate all the dimensions with the same weight, making all dimensions have the same importance. The other 30% do not have a consensus on how it should be aggregated.

Regarding the dimensions and measures used throughout the articles, a total of 54 dimensions and 649 different measures were found. This number could be reduced if there was a universalized acceptance of them, since many of them were calculated practically the same way. Analyzing only the 10 most used dimensions, it was concluded that the tangible dimension was the most accepted by the authors (with 58% of frequency), followed by Assurance, Outcomes, Reliability, Empathy and Responsiveness with 30%. Despite being the most used dimensions, they present a considerably low frequency when seen as a top 10, demonstrating a clear lack of consensus between which dimensions to use. Regarding the measures, the frequency of use varies between 10% and 40%, never reaching high levels among the authors.

Another analysis that was taken into consideration is to understand how each of the ten dimen-

sions was calculated based on the top 5 measures of each dimension. It was concluded that there are mainly two types of dimensions. The first case is the dimension empathy, processes, assurance, tangible, outcomes, reliability and responsiveness that present a huge consensual of measures. The opposite spectrum, happens with human Resources, Safety and Patient-centered that do not have consensual measures since they present a panoply of measures used and each one of them has low frequency.

The last overview analysis showed that there are dimensions that repeat every year, which show that regardless of the year in which we find ourselves, they continue to be aspects fundamental to quantify quality. It was also concluded that both the Outcomes and the safety are gaining more and more expressiveness, and in the future their frequencies may be increasing and they will be included in the dimensions whose frequency is at 30%. Furthermore, this analysis is quite interesting, since it expresses that over the years the interests and weight that individuals give to their respective dimensions can differ.

Besides this overview analysis, three major analyses were carried out. In the first analysis it was concluded that America had the most prominence in terms of the number of articles published, however, it was in the Europe that had more significant number of articles published and a greater number of countries with interest in this field. This may have happened, since the vast majority of European countries have similar ideologies and socio-economic conditions, which leads them to possibly have interests in common, with hospital quality being one of them. In the second analysis, the economic capacity of each country was taken into consideration, and the countries were characterized on being developed or developing countries. The first conclusion reached is that both countries have practically the same percentage of published articles, however, developed countries show a relatively constant interest, unlike developing countries that since 2013 are increasing their exposure. In addition, developed countries have a lower need to use dimensions to quantify quality, unlike developing countries, which indicate a range of necessary dimensions. Quite possibly this discrepancy occurs because in developed countries certain equipment, medicines, conditions are considered as acquired, unlike in developing countries where nothing can be taken as granted, thus needing to use more dimensions to check the quality of their hospitals. The third and final analysis was related to the type of financing/health system that each country had, being divided into the bevirage model, bismarck model, national health insurance model, out-

of-pocket model and private insurance model. The conclusion reached is that the worse the type of financing/health system is, the greater the interest of the country in quantifying the quality of health. This interest may come from the great desire to change the conditions of the country, since many of the population does not have access to health care since there is no governmental help and they have to pay out of their own pocket whenever they need health care. However, despite this discrepancy between the interests of each country, all models present practically the five most used dimensions.

So to conclude, the process of creating a universal measure seems to be far from achievable. While there are dimensions that are almost universal across countries like Tangible, Assurance, Reliability, Empathy and Responsiveness, many need to consider more dimensions. This is because the socio-economic environment of the country will have a great influence on the way in which hospital quality is measured. Furthermore, it must be necessary to standardize the measures since there are dimensions that have poorly defined ones.

5.2. Limitations

The first limitation that can occur is chosen the wrong keywords and do a restricted selection of articles. Continuing with the PRISMA methodology only one databased was selected which can diminished the number of articles and analyzed. Regarding the screening process, since this process was done by one persons instead of more than two, it is possible the existence of human error since more than thirty thousand articles were found and needed to be carefully and manually selected. Finally, the screening may have some flaws since a generous amount of articles were not available using University of Lisbon VPN.

5.3. Future research

After doing an intensive research, it was obvious that this topic is very relevant for the general population. The ability to quality hospital quality can open a lot of possibilities, since it helps individuals understand the flaws that occur and where we should focus to improve them. However, this path is far from being reached and several studies must be carried out. Since this analysis was done with the help PRISMA methodology, it is possible to continue this search since it is reproducible. The next step should be select articles from other databases or diminish the selection restrictions to increase the number of articles analysed. In addition, universalize dimensions and measures can be useful, since many of them have small nuances that may not be significant and make the analysis difficult. Finally, and the most ambitious step is to start trying to create a formula to quantify hospital quality. This

measure should possibly be split into two, with one being more focused on developed countries and the other on developing countries, until this differentiation exists. As we have seen, it may not make sense to differentiate according to each country's type of health system, as there were not many differences in relation to the dimensions that gave more importance.

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