

Ciencia, salud y tecnología en Chile

Science, Health and Technology in Chile

Ciência, saúde e tecnologia no Chile

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Resumen

El objetivo propuesto para el presente artículo fue analizar el contexto histórico-lógico y axiológico de las concepciones de ciencia, salud y tecnología de la salud en Chile, con énfasis en su modelo sanitario y en la Atención Primaria de Salud. La metodología empleada da cuenta de un estudio cualitativo que utiliza un análisis histórico-lógico respecto del objeto y campo de estudio planteado, apoyado en un análisis documental con diferentes fuentes bibliográficas. Las conclusiones indican que las ciencias y las tecnologías de la salud han tenido un desarrollo histórico importante. Es innegable la influencia de referentes clásicos, europeos y algunos pensadores latinoamericanos, al entregar un soporte al valor de la salud en los colectivos sociales, como fue abordar el bien y las virtudes del ser humano a través de su pensamiento dialéctico y filosófico



para alcanzar la felicidad, la salud y la calidad de vida de las personas, conceptos de invaluable utilidad en la educación en ciencias médicas y en las tecnologías de la salud, sustentadas en el valor de la salud desde la perspectiva ético-moral, en tanto es un bien común garantizado constitucional y legalmente; no obstante, fue dejado como un bien transable en el libre mercado con la llegada del régimen militar a partir de 1980 en Chile. La Atención Primaria de Salud como estrategia de desarrollo y superación de la pobreza cumplió un rol relevante con una salud más asequible, resolutive y humana, exhibe logros sanitarios similares a los de un país desarrollado. Aun así, se requiere fortalecer la formación de competencias de quienes trabajan en el área de las ciencias y tecnologías sanitarias, en particular de los gestores del primer nivel de atención, pues están llamados a generar y mejorar políticas públicas de salud que profundicen estos logros.

Palabras clave: atención primaria de salud, ciencia, salud como valor, tecnología de la salud.

Abstract

The objective proposed for the present article was to analyze the historical-logical and axiological context of the conceptions of science, health and health technology in Chile, with emphasis on its health model and primary health care. The methodology used accounts for a qualitative study that uses historical-logical analysis regarding the object and field of study proposed, supported by a documentary analysis with different bibliographic sources. The conclusions indicate that the sciences and health technologies have had an important historical development. The influence of classical, European and some Latin American thinkers is undeniable, by giving a support to the value of health in social groups, such as addressing the good and the virtues of the human being through their dialectical and philosophical thinking to achieve happiness, health and quality of life of people, concepts of invaluable utility in education in medical sciences and in the technologies of the health, based on the value of health from the ethical-moral perspective, as it is a common good guaranteed constitutionally and legally; however, was left as a tradable good in the free market with the arrival of the military regime since 1980 in Chile. Primary health care as a strategy for development and overcoming poverty played a relevant role with health more affordable, resolutive and humane, exhibiting health achievements similar to those of a developed country. Even so, it is require strengthening the training of those who they work in the area of health sciences and technologies, in particular of the managers of the first level of care, since they are called to generate and improve public health policies that deepen these achievements.



Keywords: primary health care, science, health as a value, health technology.

Resumo

O objetivo proposto para o presente artigo foi analisar o contexto histórico-lógico e axiológico das concepções de ciência, saúde e tecnologia em saúde no Chile, com ênfase em seu modelo de saúde e atenção primária à saúde. A metodologia utilizada é responsável por um estudo qualitativo que utiliza análise histórico-lógica referente ao objeto e campo de estudo proposto, suportado por uma análise documental com diferentes fontes bibliográficas. As conclusões indicam que as ciências e as tecnologias da saúde tiveram um importante desenvolvimento histórico. A influência de pensadores clássicos, europeus e alguns latino-americanos é inegável, dando um suporte ao valor da saúde em grupos sociais, como era abordar o bem e as virtudes do homem, através de seu pensamento dialético e filosófico para alcançar a felicidade, saúde e qualidade de vida das pessoas, conceitos de utilidade inestimável na educação em ciências médicas e nas tecnologias da saúde, baseada no valor da saúde a partir da perspectiva ético-moral, como é um bem comum garantido constitucional e legalmente; no entanto, foi deixada como um bem comerciável no mercado livre do regime militar a partir de 1980. A atenção primária à saúde, como estratégia de desenvolvimento e superação da pobreza, desempenhou papel relevante com a saúde mais acessível, resolutiva e humana, exibindo resultados de saúde similares aos de um país desenvolvido, e que requerem o fortalecimento da formação daqueles que atuam na área de ciências e tecnologias da saúde, em especial dos gestores do primeiro nível de atenção, uma vez que são chamados a gerar e aprimorar políticas de saúde pública que aprofundem essas conquistas.

Palavras-chave: atenção primária à saúde, ciência, saúde como valor, tecnologia em saúde.

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Introduction

It can be affirmed that Chile has reached a good level of health reflected in its macrosanitary indicators (infant mortality, maternal mortality, vaccine coverage, among others) (Goic, 2015), product of a reasoned act where science has done its thing, nevertheless, it is valid to think from a science that transits from natural epistemology to an epistemology of the altered, since the human intervenes the natural, which opens the possibility of a critical rationalism against instrumental rationalism, since science assumes ethical responsibility over human existence (Pradenas, 1998).

The achievements in the field of science in Chile were the product of a pre and post republic historical development (Benguria, 2015; Iommi and Uribe, 2014; Ramírez and Leyton, 2017), and that in the eighteenth and nineteenth centuries had the influence of models of democratic-liberal and progressive government, namely, of the United States and Europe, with the presence of the Creole oligarchy since the beginning of the republic, who preferentially accessed education and culture.

In this context, health sciences and technologies (TS) in the country have had the challenge of being at the forefront in the development of projects, whose social responsibility is the transformation of the human being, society and the environment in which people develop, which requires prepared human capital, developed in science, capable of provoking organizations and governments in the dialogic challenge of contributing to a dignified life in the economic and social of people, to achieve happiness and the development of its virtues from an axiological and human perspective.

If the above is taken into account, it is important to resignify the historical evolution of science in the country to understand its implications in the different scientific areas of human development, where health is no exception. And in this sense it is valid to ask the following: What is the origin and historical development of science in Chile? What are the main valuations of science and technologies in the country? What is the relationship of science and TS with the facts and the right of health of people? How has the progress of science influenced Primary Health Care (PHC)?

In accordance with the above, the objective set for the present work is to analyze the historical-logical and axiological context of the conceptions of science, health and health technology, with emphasis on the Chilean health model and Primary Health Care in the country.



Methodology

The following work is a qualitative research of a historical-logical nature that allowed us to take a tour of the evolution of the object of study and the field of research raised by analyzing the theoretical positions of national and foreign researchers. This analysis allowed structuring the work on topics related to science, health and TS in general, led to the Chilean reality in particular. In addition, a documentary analysis was carried out to collect primary information from books, scientific journals, publications from direct sources or from a search of articles of journals indexed in EBSCO, Bireme, Scopus, Pubmed, Scielo, Google Scholar, among others. The bibliographic review methodology allowed the selection of printed and digital literature at the international and national level.

In accordance with the above, the theoretical framework seeks to explain the epistemology of science and its relationship with TS, as well as its historical-logical development in Chile, the axiology of the health concept, the contributions in these areas of wise classical Hellenic thinkers, Europeans and Latin Americans, key actors in the world of social medicine and from the context of PHC, in order to make visible the ethical and moral elements that are behind the construct already mentioned in the country, and how this affects health as a value from the sciences and the TS both in the facts and in some aspects of law and results in these areas.

Results

The importance of science in social health problems

The apostle of Cuba, José Martí (1885), the founder of the Cuban Revolution, said: “Nothing suggests so much and such beautiful literature as a science paragraph (...), so much so that a scientific axiom becomes an eminently graphic form and poetics of an axiom of human life” (p. 141). The above evidences the importance that science has for the development of the human being and the social transformations generated by it from science.

Science is a collective and organized body of modern times that has been the result of the development of the individual and society (Bernal, 2004). Science is carried out with social responsibility, oriented towards the common good, responding to specific objectives and knowledge, as it is dynamic and changing. In the hands of the human being, he is able to model his behavior, and as an instrument he can influence his environment, his social and political actions. From an epistemological perspective, it is understood that science provides man with reflective



potential, endows them with forms, methods and procedures that, subject to their metacognitions, relate it to the living and practical environment where it develops.

Gnoseologically, it has the means and technologies to access knowledge. The love for this on the part of the human being allows him to validate and sustain it from the rational, critical and empirical, as part of a process of continuous construction and deconstruction. This is evidenced, for example, in Greek philosophy, which transferred knowledge from father to son, from teacher to apprentice, from educator to educator.

The systemic approach of the sciences allows to treat it as an organized whole and developed by the “epistemological triangulation” in the interpretation of the teaching-learning process, in which knowledge is regenerative and circular (Fernández, 2012), which is assumed and validated worldwide.

At the International Council of Scientific Unions, held in Budapest in 1999, the conference “A science for the 21st century” was given, which generated an approach to science in relation to society, with an emphasis on education, scientific cooperation, interdisciplinarity, with more ethics in its practice and above all more democratizing. The invitation was to review how this knowledge system is used, underutilized or not used, since one of its purposes is to promote its development through the solution of practical problems. Science must also be at the service of organizational and corporate knowledge, in relation to the social and environmental environment, context where it is more likely to find the “awareness of science” as a way to solve uncertainties and ethical-value problems. Accordingly, the different scientific disciplines and the TS must face the challenges of knowledge in an interdisciplinary way, putting them at the service of the community and the common good, with a humanistic approach and contribution to social peace.

In this context, science loses its meaning if it humbles the human being, if it takes away his spirit and the earthly space called world. That world where, in the opinion of Bunge M (1995), men and women strive to “rule” to make it more comfortable. An artificial world built from the world of ideas called science, which is characterized as rational, accurate, verifiable and fallible knowledge. The operationalization of these characteristics is carried out through the method, which for the formal (ideal) sciences operates under the rational and logical foundation, and in factual (material) sciences it requires observation and practical experimentation.

The social studies of science and technology as a field of knowledge constitute an area of production of important ideas in the political dimensions, management of science and technology, with great influence and development in the educational context, by favoring the conception and



understanding of the phenomena that correspond to the social nature of science and technology and their relationship with social contexts (Macías, 2010). The above is in relation to the innovations that countries assume, with revolutionary changes of all kinds, expressed in the most diverse fields of economics, education, scientific and technological policy that attempt to offer effective responses to these challenges in order to be at the service of people (Núñez, 1999; Núñez y Macías 2007).

Historical development of science in Chile

In the opinion of Benguria (2015), during the period of the Colony, from the year 1600, the first antecedents of the sciences in Chile are found, with the creation of religious schools linked to the congregations of Dominicans and Jesuits. The first university was founded in 1767 under the name of Universidad Real de San Felipe (current University of Chile), so its origin is prior to the independence of the country. However, the development of science in Chile was scarce until the end of the 18th century, period from which it has a turnaround with the revolutionary ideas of the European Enlightenment brought by the Creole aristocracy, represented among others by Manuel de Salas, founder of the Academy of San Luis in 1797, and Juan Martínez de Rosas, lawyer, promoter and professor of physical sciences, mathematics and philosophy. On April 9, 1812, it was published in the first newspaper founded in the country, *La Aurora de Chile*,¹ a writing entitled "The importance of Education, first part" by Juan Egaña (April 9, 1812), who noted the importance of knowledge, science and education in the life of the republic and its citizens. From this writing the following fragment is extracted:

The practice of solid sciences and the useful cultivation of talents is inseparable from the greatness and happiness of the states. It is not the number of men that constitutes the power of the nation, but its well-groomed forces, which come from the strength and depth of its understandings. When they know how to calculate the relationships that things have with each other, they know the nature of the entities,

¹ *Aurora de Chile* fue el primer periódico nacional. Fue dirigido por Fray Camilo Henríquez, por encargo del prócer de la patria don José Miguel Carrera, ideólogo y gestor de este proyecto, con la finalidad de mantener informado al pueblo de los acontecimientos más importantes que ocurrían en la vida nacional, además de entregar educación y cultura.



they acquire new forces with mechanics, they govern families and peoples with politics and the economy, they also know how to direct all their sights to a common point. and use nature anyway (párr. 3).

According to Benguria (2015), it was Mariano Egaña (son of Juan Egaña) who as the plenipotentiary ambassador in Europe managed the coming to the country in 1842, of the Spanish engineer Antonio Gorbea, who was a professor at the National Institute and then dean of the Faculty of Physical and Mathematical Sciences of the University of Chile; as well as in the same year, that of Andrés Bello, who was founder and rector of the University of Chile and editor of the first Chilean civil code. It also refers to other events relevant to science in the country at the end of the 19th century, such as research in the southern area of Fitz Roy and Darwin; Claudio Gay and Ignacio Domeyko in the north-central part of the country; the creation of the scientific society of Chile in 1891; the taking of the first radiography in 1896, the latter an extraordinary fact since Roentgen discovered X-rays the previous year (1895). Then records of the astronomer Albert Obrecht on the determination of orbits of planets and comets are produced; as well as the works of Luis Zegers on the constitution of matter, among many others. At the beginning of the 20th century, the country grew in its scientific development with influences from Europe and the United States. In 1920 the first master's and doctoral programs in the country are created; However, in parallel, students emigrate to the US. UU. and to the European continent in search of postgraduate training.

Health technology

A good way to contextualize the scope of the TS is to refer to Cuba, since it can be affirmed that the work and thought of Dr. Fidel Castro Ruz is an exemplary political will path for nationalist states, and at the same time, a route where The symbolic of the country is achieved with scientific progress. In this sense, one of his famous quotes was: “Independence is not a flag, it is not a hymn, or a shield, independence is not a matter of symbols, independence depends on technology, it depends on science in the today's world ”(Bonachea, 2008, p. 249). On the other hand, the incorporation of the studies of science, technology and society in the general comprehensive training of the health professional allows to increase the development of the scientific-technological culture, to contribute to the transformations of the ways of acting of these professionals.

Several authors have contributed to the development of these issues with their scientific, social or philosophical approach, including Marcuse (1964), Habermas (2008), Mitcham (1995). The latter,



for example, relieves the relationship of philosophy, ethics, science and TS; Emphasizes the importance of a harmonious development of the human being in relation to nature, socio-cultural and political development, a company that attacks with more force since the 70s of the last century, where medical bioethics gains notoriety with the arrival of genetic engineering, which forced the establishment of appropriate protocols for its safe development.

At the same time, philosophy influences an interpretation of the meaning of technologies, so that they survive in their humanistic dimension. Similarly, today it is necessary to revitalize humanism as a theoretical and practical understanding of the process of formation of the individual so that sciences and technologies are at the service of humanity, from a formative perspective, with a socio-humanist approach and where universities They have a lot to contribute (Torres, Álvarez and Obando, 2010).

In the document Evaluation of technologies in health: applications and recommendations in the Colombian social security system in health (Cubillos, 2005) it is emphasized that, in their initial conception, TS are somewhat confusing, that curative or high-cost technologies are less and less referred to and rather reference is made to technologies associated with administrative, social, environmental and preventive fields, which makes sense since the generation of policies aimed at health systems. The conceptualization mentioned by this author is that the TS “are the set of instruments, procedures and medications used to promote healthy states; prevent, cure and alleviate the disease, as well as rehabilitate and take long-term care of the consequences produced by it” (Cubillos, 2005, p. 14).

The value of this definition is that Cubillos (2005) based on the conception that exists in Colombia and analyzed it by contrasting it with nine other international definitions of organizations or countries of the world. All agree that TS are “instruments, procedures and medications” (p. 14). The instruments are understood as administrative schemes in an organization, such as payment models for the provision of services or economic analyzes that surround the formulation and execution of a health policy. The procedures refer to therapeutic, diagnostic, rehabilitation and those used in the execution of public health programs, for example, those that inquire about water quality. Medicines means the analysis, management and therapeutic use of medicines.

This conceptual clarification is important to understand the scope of action of the TS, context in which this research is limited. The definition also incorporates the concepts of health promotion, prevention, cure and rehabilitation, which have their own development in Public Health (SP) and in PHC.



The human being is the representation of something that changes, with or without disease, with or without the influence of science or TS. That is to say, the individual is a sociocultural medium where science and TS meet as the object and subject of man, which, in a positive sense, should look towards perfection and development; However, in many parts of the world this does not occur as a result of the concentration of wealth, which in general facilitates access to the benefits for a few who concentrate it, and rather makes it difficult for the majority of the population, especially to people with lower economic incomes, such as the working class, homeless and poor.

In this sense, it is worth asking: What is the meaning of science and TS? Science and TS for what and for whom? It is clear that the meaning and the greatest challenge of science is to be at the service of humanity, with a social and ethical commitment oriented to the common good and happiness of people, with TS available for all with decisive access mechanisms, with a real involvement for its generation, promotion and articulated development between public and private entities.

The health phenomenon

The conception of health according to some classical thinkers

The definition of health of the World Health Organization [WHO] (1946) is as follows: "The complete state of physical, mental and emotional well-being, and not just the absence of disease" (p. 100). This is a theoretical construct that classical philosophers already handled. For example, the doctor and philosopher Galen, who lived in the 5th century BC. n. and. in Rome, in agreement here with Escrivá (1985), he understood the disease as "a preternatural disposition of the body, by work of which they suffer the vital functions. A man's disease is always a state of the body" (p. 385). For Romero et al. (2011), Galen based his biological knowledge on Aristotelian thinking, therefore, his conception of disease is based on the biological theory of classical Greece about the four moods, which considered health as a state of equilibrium between nature of the organism and its functions. And according to García (1996), Galen made contributions to the conception of diseases of the body and soul, as well as helped to specify, according to his time, the term here in question as follows: "Disease is a state of the body, contrary to its nature, for which they immediately suffer vital functions (we have for physin kataskeue tou sornatos kai aitia tou beblaphtai ten energieian)" (p. 708).



Another relevant thinker of the Hellenic philosophy was Socrates, who although he did not contribute to the field of health, his relationship can be argued from the art of language, oratory and logic, which is reinforced by evolutionary psychology with the construction of thought and language in the socialization of the individual, which, according to Vigotsky's sociocultural thinking, develops from the ontogenetic a thought and a language that come from a different genetic origin, with a pre-intellectual stage in the speech of a child and a prelinguistic intellectual stage; developed independently of each other and that in the future are found in verbal thinking and rational language (Carrera and Mazzarella, 2001).

Socrates, a scholar of ethics and the ability of rational and critical dialectic through language, was recognized for basing his knowledge on the art of dialogue: he was mentioned as someone who thought in dialogue and dialogued thinking. This philosopher had no direct relationship with medicine or the art of healing, but his link with it was in the sense of his belief in universal medicine, which were the development of thought and search for truth, as ways of understanding and explain life, happiness and doing good. Unlike the sophists, its premise was that if there is something that is not known then their knowledge is sought through thinking, dialogue and science, supported by rhetoric to discover the truth of things. In this sense, Socrates is a forerunner of science while his epistemology of knowledge is based on majesty,² which is to bring the light of knowledge through dialogue to be taken to the earthly, which gives recognition to scientific knowledge with practical knowledge.

Socrates complements the episteme of good as a rational and logical act, with the practical dimension of knowledge and which in the field of health translates into the ethics of truth through research questions, with a rational epistemological framework applied to reality practice of training processes.

As is known, one of the closest disciples of Socrates was Plato, continuator of his knowledge, who managed to reach deeper levels by linking his own work with science. Plato centers the development of good with the perfection of the Socratic dialectic as a paradigm of true knowledge. This thinker finds what his teacher failed to specify and what Socrates called the *ti esti* (essence) of logical thinking, and what Plato called *gender*, a way in which discourse and dialogue are a true combination of ideas.

² Este método del pensar fue inspirado en su madre de oficio, “comadrona o partera”, que traía la luz de la vida al mundo en la asistencia del parto. Por analogía, con la mayéutica socrática, el hombre puede parir ideas y traer la luz del conocimiento a la vida a través del diálogo.

Plato achieves good through moving from ideas to categories, constructing hypotheses, reconstructing multiplicity in the unique whole, which, in effect, is contrasting hypotheses to create new identities, passing from hypotheses to hypotheses through the dialectical method. , which he called the anhypothetical, where the idea of good is a supreme conceptual category. Plato developed in the world of philosophical sciences what we know today as a scientific method: there the sciences and TS are not alien. In this sense, he laid the foundations for critical thinking in clinical and social medicine, in the generation of hypotheses and research questions, in seeking the correct functioning of things, of the senses, of the body, of the mind and of the science in general

Aristotle was another great Greek thinker who approached the ethics of good through Socratic logic and discards Plato's anhypothetical theory. Aristotle focuses on good as the way of progress of people's virtues and their practical valuations. So that his contribution can be related to the legacy of this thinker in the formation of virtuous people in what they do, in the understanding and transformation of the environment, in the category of valuations that can be made of the knowledge taken into practice, what which is of vital importance for sciences and TS.

Conception of health in Chile from the republic

After the creation of the Republic of Chile (September 18, 1810), the conception of public health was not an easy task, since it was not understood as a science and an art that included the acts of preventing, promoting, curing and rehabilitate the disease in a population group, as part of the non-delegable role of the state, but rather it was understood as hygiene, beneficence, health of people. This role in the first post-independence Republican governments was often misunderstood as the hygiene of sweeping streets and squares, painting houses and buildings, leveling ditches in the city, providing food, rather than dealing with the health of the population.

Health was not always assumed as a real concern of the government, which led to shaping the idea of charity and charity in the wealthiest families, configuring these artifacts linked to the thinking of private people who held wealth, as forms of care organization of community health through charity boards, with support from the Catholic Church (Salinas, 1983). However, as a result of the lay-religious conflicts of the late nineteenth century, a new role of the state in terms of health was created towards the twentieth century, permeated by the precepts of European solidarity and welfare state.

In 1940, the health organization in Chile was characterized by 1) dispersed, centralist and poor state health services; 2) existence of the compulsory workers' insurance service and 3) existence



of the public charity board, old private charity organization, owner of the hospitals and some dispensaries or polyclinics (Jiménez, 2001).

After the great earthquake in Chile of 1930, the country faced the obligation to organize health systems with a catastrophe approach, which motivated the health minister of the time, Dr. Salvador Allende Gossens, also president of the political party Acción Popular, to develop a reform to Law No. 4.054 (Obligatory Workers' Insurance Fund). Through this, pension funds were separated from workers' health funds. After 11 years of parliamentary discussion, the National Health System (SNS), inspired by Bismarck's welfare state in Germany, was created with the enactment of Law No. 10,383 in 1952, the social contingency model of Beveridge in England and in the ideas of Salvador Allende's historical materialism in Chile.

After this reform, health ceases to be the work of charity and becomes a human right as an inalienable duty of the state. The new action of the public health policy was left to a health ministry with a unitary structure in the country and with 16 health services dispersed from north to south, which decided social health benefits for workers and their families. The separation of the social security provision from the health forecast marked an unprecedented milestone in Chilean public health, since it integrated the most developed services of workers' insurance with the poorest of health and public welfare.

However, with the coup d'etat of September 11, 1973, the military dictatorship of Augusto Pinochet changed the SNS to the current National Health Services System (SNSS), as part of a constitutional reform that was promulgated on October 21 of 1980, according to Supreme Decree No. 1,150 of the Ministry of Interior, and that in its Article 19 No. 9 assures all people “the right to health protection” (Figuroa, 2013), which will be referred to later in this work.

Axiological foundations of health, a revaluation from history, law and ethics

A first axiological approach to the concept of health is to look at universal history, where beyond the dialectical importance of being right or wrong, about happiness and virtues, interest in life lessons or examples that revalue the health of persons. In this sense, Martí (1962) and González and Camejo (2015) tell, from Greek mythology, the story of the god Sclepius, which we know in the West as Asclepius, and which is related to medical sciences by his famous staff. This mythological god shows in its essence a story that brings together a cluster of values that medicine, science, TS and medical education should bring to the present.

Sclepius (Asclepius) was highly valued and respected for the noble delivery dedicated to the healing of sick, crippled and blind people who longed to recover their vision. His patients prayed



to him, offered sacrifices and fell asleep on the porch of the temple to receive the message in sleep regarding the healing of their ills. Waiting, people were served by their priests, called therapeutai (therapists). He formed a sacred family by marrying the deadly Epione, his only wife, with whom he had seven children, two men (mortals) and five women (immortals), all dedicated together with his father to the work of protecting, caring and healing the sick, what is a mythological anticipation of the specialization we see in contemporary medicine. He also stood out for the love, piety and concern for the well-being of his patients, without discrimination, universal legacy for all health careers.

Another great thinker who made an axiological contribution to the health field was José Martí, who, according to Todelo (2005), outlined his classic preventivist idea by saying that “it is easier to prevent the disease than to cure it”, which is consistent with the Cuban prophylactic orientation, which considers it as the general orientation of prevention and promotion of public health. In his own words:

The art of healing consists more in avoiding the disease and taking care of it by natural means, than in fighting it by violent and inevitably harmful means for the rest of the system, whose balance is set to contribute to the benefit of the diseased organ. Hygiene is the real medicine and with a bit of attention, each one can be a bit of a doctor. Teaching hygiene in public schools must be made mandatory (Martí, 1882, p. 286).

The hygienist and preventive view of the health of the Cuban hero is appreciated, whose epistemic basis rests on science and TS to exercise the trade and the art of healing, but also on one's own knowledge. It is noteworthy that what the Declaration of Alma Ata defined as “self-knowledge and self-determination in health” in its conception of PHC (PAHO / WHO, 2003) understood as the ability of people to prevent and prevent health damage caused by their own knowledge and decisions in this matter product of the advancement and development of the states in scientific, technical, political and economic matters, Martí had indicated it almost 100 years before.

From another perspective, there were two Latin American doctors who, because of their life stories, added value to the conception of health: doctors Salvador Allende and Ernesto “Che” Guevara.



Allende³ (1939) He stood out for his medical, political and governing performance, from which he worked on social security and protection policies, the biological recovery of the patient, the economic reparation generated by the disease and the contribution to the reduction of maternal and child mortality described in his text *The Chilean medical-social reality*. In his government he dictated laws that organized work and gave social orientation, since human capital was the basis of all wealth, welfare, progress, culture and better sanitary conditions at the social level. According to his humanistic thinking, there is better health and education in a town that dresses and feeds better, which is not a prey to vile exploitation.

Ernesto "Che" Guevara was another Latin American doctor who inspired health and social changes. When touring America as a student and then as a doctor, he faced the harsh reality of knowing the misery, hunger, diseases and exploitation of the peasant people, all of which was very well grounded in his speeches and written in press or books. He knew the inability to heal children due to the lack of means, observed in person the beaten classes of what he called our American homeland, through which he became aware of the impoverishment of the human being when poverty and hunger become of it. Perhaps that is why Che Guevara (1970) wrote: "It is worth millions of times the life of a single human being, than all the properties of the richest man on earth"⁴ (pp. 70-80), what anyone with the least humanistic sense can value. However, this conception is resignified from the medical work in community, extrapolated to any health professional, through the field work with people and that, as Ruíz (2008) mentions, Che Guevara will express as follows: "The doctor, the medical worker, must then go to the center of his new job, which is the man within the mass, the man within the collective" (p 35). For Ernesto Guevara, public policies had to assist as many people as possible, to prevent everything preventable in terms of diseases, to assist the population in their community, with their social reality, with orientation and education to the people.

Fidel Castro is another personality in whom you have to stop if you want to analyze health as a social value, because he had the visionary capacity to create, model, plan and implement health

³ Salvador Allende Gossens fue dos veces senador de la República, ministro de salud durante el gobierno del presidente radical don Pedro Aguirre Cerda y presidente de Chile durante los años 1970 a 1973, caído en armas en la casa de gobierno durante el golpe de Estado el 11 de septiembre de 1973.

⁴ Esta frase es parte del discurso que Che Guevara dijera en el Colegio Médico Nacional de Cuba, en agosto de 1960, el cual posteriormente se titularía "El médico revolucionario", y donde expusiera los fundamentos políticos, sociales y humanistas de abordar la medicina.



care processes in Cuba, which can be seen in his multiple speeches delivered and that are very well documented. For example:

Caring for the health of the people, avoiding their sufferings and healing their illnesses is a task, mainly, of social and moral order; but it also has an economic sense, since it is the men and women of the people who create the values, and a working, healthy and strong population is essential for development.⁵ (Susi, p 285).

And another example:

As long as health is not considered as a fundamental right of man and a duty of the community, as long as the responsibility of the state and society in health care is not recognized, as long as the inequalities in distribution do not disappear of resources for health at national and international level, as long as poverty, man, ignorance and unhealthiness are not fought head-on, there will be little that can be achieved in the improvement of human health in the underdeveloped world (Susi, p 286).

In these two fragments of Dr. Castro Ruz, the high meaning that people had for him is appreciated, as well as the fact that it was a moral imperative to protect his health, from which his humanist conception, essential for human development, is deduced. At the same time, for him there is no more important responsibility than that of the state and community. Both had to work together to eliminate the social inequality gaps and the evils that poverty entails, that is, work for what we now call the social determinants of health, to promote the health of people and the development of peoples.

In another classic speech by Dr. Fidel Castro Ruz (October 1962), delivered on the occasion of the inauguration of the Victoria Girón Institute of Basic and Preclinical Sciences, he said:

How attacks the revolution against diseases? preventing these types of diseases through vaccination. And so we will fight disease by disease, so we will decrease the number of epidemics, the number of victims. And so the great purpose of moving from therapeutic to preventive medicine will be fulfilled. That is, prevent citizens from getting sick (Alemañy, Otero, Borroto y Díaz, 2002).

Impress the clarity with which he shows his vision of public health to intervene in the natural history of diseases, typical of a health model with a promotional and preventive approach

⁵ Discurso pronunciado en la inauguración del II Congreso de la Asociación de Economistas del Tercer Mundo, el 26 de abril de 1981.

to health. In addition to this, he integrated actions of this type based on the community and oriented to the families of these communities, which is evidenced in the act of constitution of the medical science detachment Carlos J. Finlay in Havana, where he clearly expressed what next:

The family physician program is a structured community care model that responds to the needs of having a new doctor who could understand, integrate, control and coordinate the health care of the individual and his family, considered within the context of its members and related to the community where they live and to the society to which they belong. That doctor practices a scientific and humanistic medicine, has a deep social orientation, interacts with the entire community in an active way, influencing and participating in the modification of problems that affect the environment (Castro, 1982).

With this, he declares two fundamental principles for PHC and family health: the integrality and continuity of health care and care. Here you can see its transformative spirit, which not only guaranteed safe care for people and families affected by disease processes, but also guarantees the participation of families in their own treatment, which is why it reorganizes the primary level of health with their family polyclinics in charge of a comprehensive general practitioner and a family nurse.

In addition to these Latin American references, there are researchers and philosophers who have contributed to the assessment of health. According to Abbagnano (1954), the German philosopher Max Scheler (1874-1928), in his theory of values, considers these as “In addition to these Latin American references, there are researchers and philosophers who have contributed to the assessment of health. According to Abbagnano (1954), the German philosopher Max Scheler (1874-1928), in his theory of values, considers these as “an objective world, that is, independent of the fact or act of his apprehension; and, as an objective world, it has its own laws a priori (...) these determine, first, the hierarchy of values ”(p 716). Scheler places on the scale of values first the pleasant and the unpleasant, then what he calls vital values such as health and illness, as good and bad. A third level is the spiritual as the aesthetic (the beautiful and the ugly) and the legal. The last form is the religious that places man between the spiritual and the profane. All of the above in relation to an eternal and hierarchical order.

The bias is recognized and the inevitability of leaving out many authors, you can also name Jover (1974), with his synoptic vision of the culture of positivism in health, on which he bases the inclination of the human being towards concrete and observable, towards the rational and scientific



knowledge of things, natural sciences prevail; Scholle (1990), with his bioethical view of health; Lolas (1990), exposing his metatheory of the integration of behavioral sciences and biomedicine; Merof (1994), with his analysis of the role of culture in medical activity, which has been studied based on his theoretical proposals and a medical model that responds to the needs of social practice; Rodríguez (1985), especially his book *Philosophy, science and value*, where he explains the peculiar nature and the philosophical reflection of the reality that unites the scientific and the evaluative, relevant to health phenomena.

There is no doubt about the importance of resignifying health as a value, with which bioethics takes center stage in the health field. In this regard, Frenk (2013) expresses that there are three trends that mark the face of world health in the 21st century, namely: 1) the progressive international transfer of risks and opportunities for health; 2) the multiplication of the number of actors in this field, and 3) the increasingly critical role of health within the agenda of development, global security and democracy. This sets up scenarios where bioethics and ethics are part of a path that health science workers have to strengthen to face the resolution of increasingly complex dilemmas at the level of clinical and family care, research clinic, teamwork, health organization management, environmental and ecosystem problem management, policy generation, among others (Rubilar y Rossi, 2015).

Health as a value is also understood as a universal human right. It is enshrined in the Political Constitution of the Republic of Chile, in its article 19 N° 9, according to the Honorable Chamber of Deputies of Chile (2017). Now, for this single fact: can we say that health in Chile is valued by its citizens? The answer will be conditioned according to who makes the assessment, since the sure answers will be different as made by a homeless person, a patient of the private model, a politician, and so on. In addition, the answers will be conditioned if the violated value is binding with rights enshrined internally or externally in the country.

The constitutional reform of 1980 enshrined the right to health as a “right of protection” that is subject to the following considerations:

- “The State protects the free and equal access to the actions of promotion, protection and recovery of the health and rehabilitation of the individual” (Honorable Cámara de Diputados de Chile, 2017, p. 15).

The legislator in this paragraph enshrined the principles of freedom and equality in access to health actions as a duty of the state, which is undoubtedly a high value of health based on the



Political Constitution of the Republic, however, what that the paragraph did not distinguish is the correspondence that this would have in the empirical, since it would be done in a mixed public health model, where families with greater economic power pay for health care administered by private health insurance called Institutions of Pension Health (ISAPRES), who enter to compete for the recruitment of affiliates and who sooner or later would seek to penetrate the public subsector market. That is, there is a factual configuration in the magna Carta to privatize health.

- “It will also be responsible for the coordination and control of health-related actions” (Honorable Cámara de Diputados de Chile, 2017, p. 15).

Although the governing function is fulfilled by the Ministry of Health, for long years this was only for the public subsystem, with minimal or no regulation on the private subsystem, which grew inorganic form, with few inspections resulting from gaps in the Law. the increase in the level of educational instruction and greater social empowerment of the population, added to health and social reforms after the military dictatorship (capitation system in the PHC, Law of Explicit Guarantees in Health, creation of the Superintendency of ISAPRES, Law of Rights and Duties of the Patient, among others), the state regained its normative, coordination and health control role for members of both health subsystems.

- “It is the state's preferential duty to guarantee the execution of health actions, whether they are provided through public or private institutions, in the manner and conditions determined by law, which may establish mandatory contributions.” (Honorable Cámara de Diputados de Chile, 2017, p. 15).

Like the preceding paragraph, this constitutional paragraph was left by the legislator in a legal vacuum. However, the reader will realize that the fundamental letter expressly states that health actions will be provided by public and private institutions, so that this universal right was left open to the health market, which is not solidary, discriminates due to risks and that eventually became one of the most profitable private businesses from the military dictatorship to the present day.

- “Each person will have the right to choose the health system they wish to benefit from, whether state or private.” (Honorable Cámara de Diputados de Chile, 2017, p. 15).

Although it is true that the legislator consecrates the principle of freedom and autonomy of the will of the people to choose the pension system, it is no less true that the autonomy of will is contingent on the economic capacity of families to join one or the other model, with the understanding that the public subsector ensures health for the poorest and with less resources. It



follows that to comply with this constitutional assignment (art. 19 No. 9), an equitable distribution of health resources must be provided, with expedited and timely access to health promotion, protection, recovery and rehabilitation care. However, this is not enough, since for effective health protection improvements and adequate management of other relevant social actors that influence the social determinants of health, such as the environment, economy, industry, are required. , education, etc.

Externally, the International Covenant on Economic, Social and Cultural Rights [Pidesc] (2012) of the United Nations Organization (UN) places the rights related to people's health in a broad and comprehensive context, namely:

Right to the highest possible level of health. Establishes the obligation to adopt measures to reduce stillbirth and infant mortality; ensure the healthy development of children; improve occupational and environmental hygiene; prevent and treat epidemic, endemic and professional diseases, as well as ensure medical assistance to all (p. 13).

At the same time, the UN Office of Human Rights enshrines universal principles that protect against discriminatory acts (International Convention on the Elimination of All Forms of Racial Discrimination, 1965).

In the same context of human rights, it is also worth mentioning that, as with the Pidesc, Chile ratified the Rome Statute (1998);⁶ However, the Chilean Constitutional Court ruled in 2002 (Role No. 346) that the hierarchy of human rights treaties is only legal in Chile. Although the Pidesc reports are not binding on the countries, in the face of ISAPRES abuses of power with their affiliates in Chile, the Constitutional Court has ruled on more than one occasion in favor of those affected by defects of unconstitutionality, as happened, for example, the year 2010 (Role N° 1710). Regarding the form of organization of the health system of the military government of Augusto Pinochet, Tetelboin and Salinas (1984), they state that, without a doubt, all areas of government were planned under a neoliberal model, with a planning system that included manage in a good way the strategic relationship with the medical school of Chile, give a different political, geographical and administrative order (regionalization) to the country for a better order and where the health actions deployed were aligned with it. As already mentioned, the old SNS was reformulated and transformed into the SNSS. There is no doubt the purpose of this government to

⁶ El pacto fue publicado por el Departamento de Información Pública de la ONU.



transform Chilean public health, achieving relative success by installing a sectoral policy that exhibited improvements gradually as part of a process. Proof of this is that with the return to democracy these structural reforms were maintained, which were followed by successive reforms that have perfected it, under the principles of normalization and reorganization established by the Pinochet dictatorship.

It is necessary to analyze the value of health from the ethical and moral, that is, from the norms, rules, patterns, values, ideals expressed in a social historical context that govern the life and behavior of people from the acts of social coexistence and educational (Berkowitz, 1995; Durkheim, 1947; Kohlberg and Candee, 1984; Puig, 1995). In this sense, the ethical and the moral have a common etymological basis. Ethics of the Greek ethos, which means 'dwelling' and then would mean 'character, way of being'. Moral of Latin mos, moris, which meant 'custom' and then derived to 'character, way of being'. So that both concepts converge in everything that refers to character or way of being and that is acquired as a result of putting into practice customs or habits considered good, and that, in the opinion of the authors, are differentiated by being ethical related to the internal and moral jurisdiction in relation to an external social context of the person, which, the latter, is the one that makes visible the human work of moral values. In this way, values reveal the globality and content of a particular moral system; hence the denomination of moral values. In the moral conscience of the human being, the dialectical-materialist relationship that it has with its natural, social, cultural and political environment influences, from whose interaction its personality and character are formed, where the spiritual is incorporated. The value of health will radiate the social and community space as long as a series of values that make it understandable and human are fulfilled. These values are the most important that a health worker should have. And according to González (2017, pp. 86-87), they are classified as primary (altruism, vocation of service, human sensitivity, involvement with their patients), mega values (humanism, spirituality, ethics, solidarity, patriotism) and other values (dignity, loyalty, humility, modesty, honesty, responsibility, honesty).

Primary health care, family health and the challenges of health sciences and technologies

For a better understanding of the concept of PHC, it is necessary to first refer to public health as an important social and governmental activity, of a multidisciplinary nature and that



extends to almost all aspects of society (Todelo, 2005). Another very comprehensive conception, and therefore influential in world public health, refers:

It is the science and art of preventing disease and disability, prolonging life and fostering physical, mental health and efficiency through organized community efforts for environmental sanitation, control of infectious diseases and trauma, education of the individual in principles of personal hygiene, organization of services for the diagnosis and treatment of diseases and for rehabilitation, and the development of the social machinery that will ensure each individual in the community an adequate standard of living for the maintenance of health (Terris, 1992, citado en Cardona, 1998, párr. 3).

PHC is understood as a strategy contained in the concept of public health. Its field of action is transferred to the governmental sphere as it is a means of community improvement and state development. However, this concept starts long before Alma Ata; It is the product of all the sanitary actions that were taking place in the field of medicine and were relevant when investigating and proposing prevention, treatment and control measures for social impact diseases (Mendoza, 2016). There were many thinkers, statesmen, politicians, revolutionaries, scientists who before and after Alma-Ata have referred to him. Although the PHC strategy marked a milestone in the way of addressing health actions in a local health system (municipality, region, country), it has not been developed with the same force in the different states, which is why WHO has promoted new transformations and approaches, such as the renewed PHC strategy (Pan American Health Organization [PAHO] / WHO, 2007).

The concept of PHC includes the family approach, which is part of a process of change in Chile from the publication of the document From office to health center (Ministry of Health of Chile [Minsal], 1993), which delivered guidelines to the country's health services and local health teams, for which it delivered the fundamentals of PHC. This document conceptualizes “the health center”, guides on the structure, organization and operation of these health organizations and on the strategies and axes of change in the primary level of care in the country.

With the above, the bases for the construction of a comprehensive model with a family and community approach were laid from that year. However, it is in the guidelines published in the text In the path of family health center (Minsal, 2008) that a greater emphasis was placed on the need to put the family as a unit of care, from which it begins to work on the principle of “continuity” of the care of the individuals that compose it, to which is added the consolidation of



the physical structure called Family Health Centers (Cesfam). With the sector reform of the year 2001 (Lenz, 2007), the foundations of a profound reform to the management of benefits in the Chilean health system are laid, and at the same time, the conception of the integral care model with family approach and community, sanctioned by law as the new way of attending. Both constructs, under the rector and technical supervision of the health services of the country and in the framework of a management around healthcare networks in Chile.⁷

Subsequently, the Ministry of Health of the country defines in its national guidelines that the system of care with a family and community approach should be based on three essential principles, namely: 1) Person-centered care, 2) Integrality and 3) Continuity of health care (Minsal, 2013).

Family health opened spaces for participation in health and intersectoral work, promotes continuous quality improvement in centers, promotes improvements in the management policy of people working in PHC, which dialogically invites reflection on how many Professionals who lead in these Cesfam are prepared to do so.

Chile does not have a health system integrated with education as a state policy, as it is in Cuba, for example. However, the PHC has its Cesfam, which are also clinical practice centers of the different health careers or social sciences of universities and technical training centers of the public and private network. Similarly, there is no consensus in Chile on what to educate from the scientific method in the careers of health or medical sciences, therefore, there is no agreement on how to teach and investigate in this regard, product of the absence of University-level policies that clarify the use of appropriate methodologies to apply at this level; and if there are, they are not public or clear. The previous thing produces a dissimilar learning in the students, centered more in the theoretical than the practical thing, what is evidenced in the formative programs (Díaz, 2011).

On the other hand, research methods are subject to the type of researcher, the epistemological paradigm, the type of applied research, the logical historical analysis, the problem, the object and field of the study determined, variables necessary to achieve certain scientific results in the Health field and TS, which are vital to improve the performance of these areas of knowledge. In the absence of clear policies, there is also no postgraduate training that supports this, to have

⁷ Esta reforma cambia de una subsecretaría ministerial de salud a dos, con lo que queda una subsecretaría de salud pública a cargo de la vigilancia de los objetivos sanitarios del país y la vigilancia epidemiológica; y la subsecretaría de redes asistenciales a cargo de la gestión técnico-administrativa de los 29 servicios de salud del país, que en lo técnico incluye a la APS con todos sus programas y el desarrollo de la salud familiar.



knowledge and method at the service of health management decisions (Tamayo, Aguirre, Besoain, 2012). The SP, PHC and family health are areas where the TS must go according to scientific advances and social transformations, since they must be drivers of organizational changes, introduce innovations in their processes, all for the benefit of themselves and the families attached to health systems. And this will have greater viability if the managers have the training in management according to what should be the subject of a broader investigation that identifies characteristics of the current managers and the managerial skills required to use in this work in Cefam.

Discussion

Science has been a fundamental construct for the development of humanity in all spheres of knowledge, and in the health field it has shown contributions in the clinical, organizational, pharmacological, bioethical, epidemiological, medical education, to name a few, and where the sense of common good is a fundamental purpose.

In the present work, the authors mean that in Chile the development of science came with the beginning of its republican period, from which a scientific and technological development prospered that prepared future generations to consolidate a secular educational model today, pluralist and humanist.

Chile went from having private health models based on charity, organized by aristocratic families at the end of the 19th century, to a model run by the State, which is perfected based on the principles of German and English social security, landed by Chileans of the Creole aristocracy that were formed in Europe or by free thinkers brought from Europe, as professors and researchers, who also strengthened different areas of knowledge and science in our country.

In this context, Chile developed in the field of science and with it took care of the problems of health sciences, installed in its sanitary scientific bases and the TS training systems that allow to deduce that there were philosophical, ethical and morals in its construct, which the authors show in the Hellenic philosophy, in European and Latin American thinkers, all of whom gave solidity to a scientific, social and health system that places Chile within the countries of the Latin American region with macroeconomic advances and macrosanitary. In addition, it exhibits an axiological



basis of health with constitutional and legal certainties, oriented towards the common good, which forces the country to face its health indicators in an integral way, since it currently has a sociodemographic profile of accelerated aging, together with a Epidemiological profile that advances at the same time, with prevalences of chronic and degenerative pathologies that increase and impact the most unprotected and vulnerable population in the public sector.

The health protection model in Chile should be reformulated to provide plans and programs that do not segment the population, that do not discriminate against risks, that offer universal access, while the country's microeconomic development shows deep inequality gaps, which remained anchored with the structural and constitutional reform carried out during the military dictatorship, which exposed social goods such as education, social security and health, to the free market. PHC is a valid strategy for the first level of care that, added to the integral model with a family and community approach, faces the challenge of promoting and improving the quality of life of the population.

Conclusions

The first conclusion of this work is related to the teaching bequeathed by different classical thinkers that link us with incorruptible concepts in time, such as the way to approach the good and the virtues of man, through his dialectical and philosophical thinking to reach the happiness and quality of life of people, concepts of invaluable utility in education in medical sciences and TS.

José Martí and Fidel Castro, together with other Latin American referents such as Ernesto “Che” Guevara and Salvador Allende, fill the spaces in science and the TS with revolutionary conceptions, and influence their ideals and principles in the development of a society more just, egalitarian and human, in populations with more education, culture and spirituality. This is a framework to revalue health in Chile; It faces a health that coexists with a neo-liberal economic market model, based on the Political Constitution of the Republic of 1980, which puts health as a tradable good, which inevitably collides with the principles of solidarity and universality of health care

Science, technology, public health and PHC can be the reflection of an idealized reality, which, from a materialistic dialectical perspective, allows us to become aware of existing sciences and possibilities: an epistemic triangulation to keep in mind in the universality of science and the TS.



The PHC is a strategy whose mission is to transform the territorial space where families and communities live, as it is a strategy of development, of overcoming poverty, of improving the quality of life, which, like the sciences, must be carried out in an interdisciplinary and interdisciplinary way, with a systemic and team approach, where the health training model is relevant, within which health management should be, because public health and PHC require optimal management, with managers who are at the height in their training and performance, which requires to be studied to face in a good way the challenges that science, technologies and health demand from society.

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