

Analysis of the Compensation Levels of Patients from the Cardiovascular Health Program: Application of a Primary Health Care Center in Chile

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Abstract: ***Objective:** To analyze the compensation levels of patients attending the cardiovascular health program of the Juan Pablo II CESFAM (Family Health Center) of Las Compañías in La Serena, Chile, between January and November 2022. **Materials and methods:** Quantitative, descriptive and retrospective study, based on a CESFAM database of 420 patients, 62 of whom met the inclusion criteria. The information was analyzed using Microsoft Excel. **Results:** Of the total number of patients included 89% were decompensated. According to sex, 91% of the patients were women and 83% were men. Eighty-seven percent of patients were classified as high cardiovascular (CV) risk. When separated by sex, 94% of men and 84% of women are at high CV risk. Patients with DM2 present the highest percentage of decompensation (95%) with respect to the other pathologies in the program. Low CV risk patients have the highest percentage of decompensation (100%) compared to moderate risk (86%) and high risk (89%). According to age range, patients in the extreme groups of the sample: <45 years and >85 years had 100% decompensation.*

Keywords: chronic noncommunicable diseases, primary health care, cardiovascular risk

1. Introduction - Literature Survey

According to the World Health Organization (WHO), non-communicable diseases (NCDs) correspond to a group of pathologies of long duration, slow progression, without spontaneous resolution and rarely achieving a cure, which result from a combination of behavioral, genetic, physiological and environmental factors. These include cardiovascular diseases, neoplasms, chronic respiratory diseases and diabetes mellitus. Currently, NCDs are the leading cause of death worldwide, being responsible for 74% of deaths in the year 2022 with more than 41 million deaths¹. In Chile they are even more determinant, causing 86% of deaths in the year 2019².

This group of diseases represents a great health care burden for the Chilean Health System due to their high prevalence, multiple complications and associated mortality. Thus, in 2002, the Cardiovascular Health Program (PSCV) was created with the aim of improving the management of this type of pathology in these patients, and thus reducing the incidence of cardiovascular events such as acute myocardial

infarction, stroke, heart failure, arrhythmias and peripheral arterial disease³.

Once within the CVSP, one of the main objectives is to control cardiovascular risk factors (CVRF), defined by the WHO as "any trait, characteristic or exposure of an individual that increases his or her probability of suffering a disease or injury". This is crucial since, based on personal CVRFs and statistical tables adapted for the Chilean population⁴ each patient is categorized into a certain level of Cardiovascular Risk (CVR), defined as the probability that a person will have a cardiovascular event, fatal or otherwise, in the next 10 years. Thus, the CVR is classified as low, moderate and high with the aim of identifying patients at higher risk who require more intensive and immediate interventions³.

In addition, based on CVR, compensation goals are established for each modifiable CVRF, with the aim of reducing the probability of presenting a cardiovascular event. The modifiable CVRFs are LDL cholesterol levels and blood pressure levels with their respective compensation levels based on CVR, as shown in Table 1. Thus, global

compensation can be considered if an individual meets the goals set according to his or her CVR.

Table 1: Compensation goals according to Cardiovascular Risk

Cardiovascular Risk	LDL Cholesterol	Blood Pressure
Under	< 130 mg/dL	< 140/90 mmHg
Moderate	< 100 mg/dL	< 140/90 mmHg
High	< 70mg/dL	< 140/90 mmHg

Source: Cardiovascular Health Program Technical Guidance 2017.

This is important because determining the number of compensated patients through a retrospective diagnosis of a health facility allows us to determine whether the compensation goals are being achieved and, therefore, reducing the CVR of the population. In this way, statistics can be generated that allow comparison over time, to evaluate the effectiveness of current health policies, and thus be able to focus resources on the solution of health problems.

Within primary health care in Chile, which is where the PSCV is developed, several studies have tried to evaluate the level of compensation and/or adherence to treatment of patients in this type of health care center^{5,6}. However, there are still no studies of this type in the Coquimbo Region. Therefore, there is a need to know the local reality of patients in the region.

Therefore, the main objective of this study is to analyze the compensation levels of patients belonging to the Chilean Cardiovascular Health Program, through the study of patients attending the PSCV of the Juan Pablo II Family Health Center (CESFAM) in the commune of La Serena, in the Coquimbo Region (Chile), during the period January to November 2022.

2. Materials and Methods

This is a quantitative, descriptive and retrospective study, in which the database of patients adhered to the PSCV during

the period between January and November 2022, of the Primary Health Care Center; Juan Pablo II Family Health Center, located in the commune of La Serena, Coquimbo Region (Chile) was used. All the information was anonymized, so no personal information of the patients was kept, therefore this research has no ethical conflicts, being approved by the Scientific Ethical Committee of the Universidad Católica del Norte Sede Coquimbo (Chile), through Resolution N°10 of the year 2022.

The database was provided by the same Primary Care Center under study and contains information on 420 patients attending PSCV controls between January 1 and November 14, 2022. However, the study sample consisted only of those patients with data on the following variables: Sex, Age, Weight and Height, Diagnosis (Arterial Hypertension, Diabetes Mellitus and/or Dyslipidemia), Blood Pressure, LDL Cholesterol level and Cardiovascular Risk. Therefore, the total number of individuals who met these requirements and became the final sample of the study to perform the characterization of the patients was 62 patients, as shown in Figure N°1.

On the other hand, the compensation level of each patient was determined according to the goals established in the PSCV of Chile. The blood pressure goal of less than 140/90 and the LDL-Col level of less than 130, 100 and 70 mg/dl according to whether the patient is Low, Moderate or High CVR, respectively. Patients were classified as compensated or decompensated, according to the achievement of the aforementioned objectives. In other words, a global compensation was established for the patients, corresponding to those who had all their variables within the compensation range, and those who had at least one variable outside the range established according to their CVR were established as decompensated.

Once the final database had been prepared, the information was analyzed statistically in a Microsoft Excel spreadsheet, obtaining cross-references between sociodemographic variables, nutritional status, compensation criteria of the underlying pathologies and global compensation.

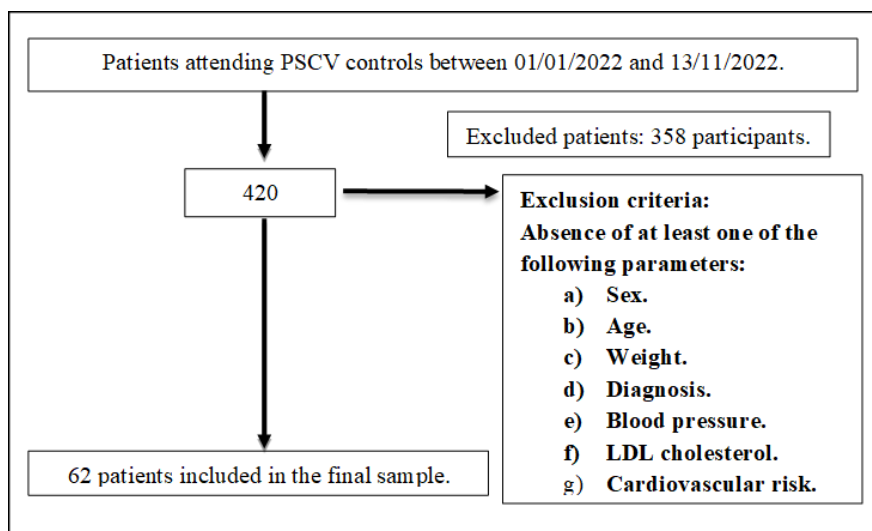


Figure 1: Scheme for obtaining the final sample according to exclusion criteria

3. Results and Discussion

The main results obtained by grouping the patients of the PSCV of the CESFAM Juan Pablo II will be described below.

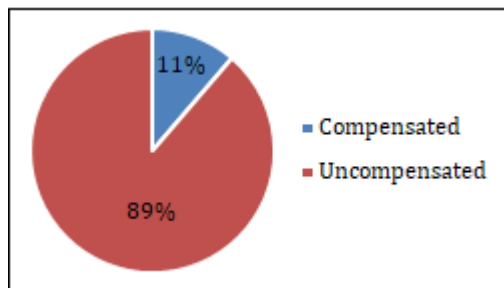


Figure 2: Percentage of Overall Compensation Level

Source: Own elaboration based on database obtained from CESFAM Juan Pablo II.

Figure N°2 shows that almost 89% of the patients do not achieve the goals established according to their CVR, as previously established in Table N°1.

These values are alarming, since they would indicate that the different measures implemented in the Cardiovascular Health Program are not being complied with, and, therefore, the risk of suffering cardiovascular events in this population would not be decreasing.

Sandoval et al (2014) argue that the main reason for unsatisfactory control in patients with chronic and asymptomatic pathologies, such as those of cardiovascular origin, is poor therapeutic adherence⁷. Veliz et al. (2014) and Iriarte et al. (2015), in turn, demonstrate that the low therapeutic adherence found in their studies of people with cardiovascular diseases would explain the low percentages of patients who manage to achieve the proposed therapeutic goals for HT, DM2 and dyslipidemias^{8,9}.

On the other hand, our data show very high levels of decompensation, which can be explained by two reasons:

- 1) That the patients in the sample obtained attended controls during January and November 2022, and, therefore, were part of a selected group of patients who were prioritized during the Pandemic by COVID-19 to resume their in-person controls, thus conforming a

selection bias in a population with a probable higher CVR.

- 2) That the patients who met the inclusion criteria of our sample (14.7%) were those in whom the treating professionals took the time to include their parameters in the database because they are probably patients with the worst results in their clinical and laboratory parameters. These patients, having a more complex health situation, should receive more complete care and that is why the values obtained during care are recorded and their data are kept up to date.

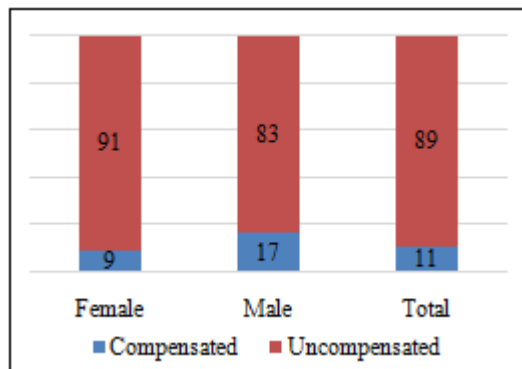


Figure 3: Percentage of compensation levels according to biological sex.

Source: Own elaboration based on database obtained from CESFAM Juan Pablo II.

When separating by sex, this phenomenon is repeated, as shown in Figure N°3, where women lead with 91% of decompensation versus 83% in men, showing that women tend to have, proportionally, a worse level of metabolic compensation. This could be explained, in part, by a greater absence to health controls. This phenomenon was studied by Iriarte et al. (2015), who found that of the total number of patients who did not regularly attend their check-ups, 64% corresponded to the female sex⁹. Along the same lines, Corral et al. (2010) establish that this situation in which women lose the follow-up of their medical pathologies is largely explained by the cultural patterns of our society (obligations, work expectations, types of occupation and family roles). These patterns frequently generate situations of physical and emotional overload, which have a marked negative influence on the control of their health¹⁰.

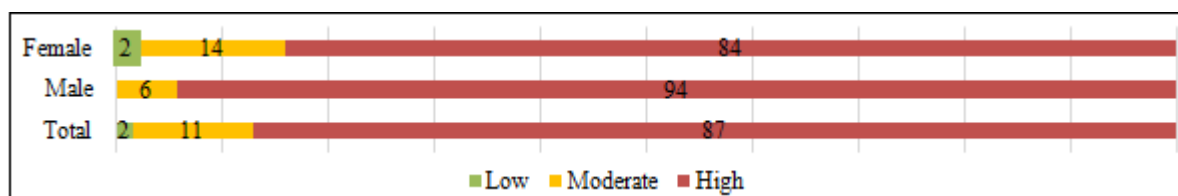


Figure 4: Percentage of Cardiovascular Risk Level according to biological sex.

Source: Own elaboration based on database obtained from CESFAM Juan Pablo II

Figure N°4 shows that, in general, the patients analyzed belong mainly to the High Cardiovascular Risk group, with more than 87% of the patients, followed by those at Moderate Cardiovascular Risk with around 11% and finally those at Low Cardiovascular Risk with less than 2%. A comparison by sex shows that although High Cardiovascular

Risk predominates in both groups, the difference is more marked in men, with more than 94%, while in women this figure is lower, at 84.1%. This coincides with the findings of Aleman and Rueda (2019) who, when analyzing adherence and quality of life in the context of cardiovascular diseases, found that women have a higher level of disease awareness,

greater adherence to smoking and alcohol cessation, and to pharmacological treatments than men¹¹.

Table 2: Compensation levels according to diagnosed diseases

Diagnosis	Compensated	Uncompensated	Total
Diabetes Mellitus II	2 (5,41%)	35 (94,59%)	37
Arterial Hipertension	2 (10,53%)	17 (89,47%)	19
Dyslipidemia	3 (25%)	9 (75%)	12
Total	7 (10,3%)	61 (89,7%)	68*

(*) There are 68 in total because of the 62 patients, there are some with more than one diagnosis.

Source: Own elaboration based on database obtained from CESFAM Juan Pablo II.

Table N°2 shows that, when comparing the levels of compensation according to the underlying disease, decompensated patients predominate in the 3 pathologies. However, the proportion of decompensated patients is higher

in diabetic patients, reaching almost 95% decompensation, followed by hypertensive patients and then dyslipidemic patients with 89% and 75%, respectively. This differs from the findings of Marcano-Caraballo and Castañeda-Silva (2022), who in their descriptive study of the CESFAM of Quinta Normal (Chile) found that hypertensive patients presented worse levels of compensation than diabetic patients, with 36% and 34.4% of decompensated patients, respectively⁵. This difference can be explained by the fact that the populations of two CESFAM can be very different from each other, in terms of socioeconomic level, gender ratio, age, burden of chronic diseases, habits, availability of studies and medications, among others. Therefore, a more exhaustive study would be necessary to find the cause of these differences; however, even so, it is possible to establish that the patients in the sample analyzed have lower compensation rates than those reported in the literature, as evidenced in the previous point.

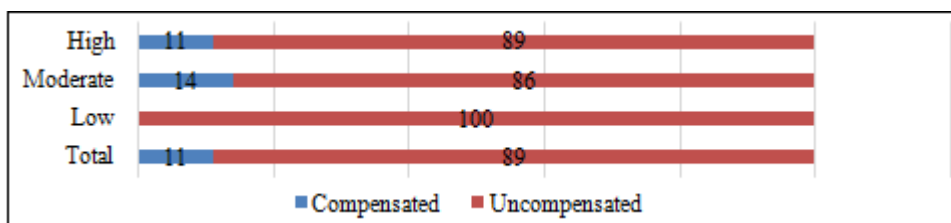


Figure 5: Percentage of Compensation Levels by Cardiovascular Risk

Source: Own elaboration based on database obtained from CESFAM Juan Pablo II.

Figure N°5 shows that when separating the sample according to Cardiovascular Risk, there is a predominance of decompensated patients in each of the Cardiovascular Risk classifications, especially in the High Cardiovascular Risk subgroup, with 87%, followed by the Moderate group with 10% and then the Low CV Risk group with less than 2%. The results obtained are more drastic than those obtained by Contreras et al. (2011), who, in a study with similar characteristics, found that only 50% of the patients at high cardiovascular risk were decompensated¹². And when

compared with the study conducted in a Primary Care Center during the period 2018-2019 by Marcano-Caraballo and Castañeda-Silva. (2022), the difference is even more marked, since they obtained only 34% of High Cardiovascular Risk patients as decompensated⁵. These values show that in the case of CESFAM Juan Pablo II (Chile) the goals for blood pressure, LDL cholesterol and glycosylated hemoglobin are not being achieved, either due to inadequate treatment or lack of adherence to these pharmacological and non-pharmacological treatments.

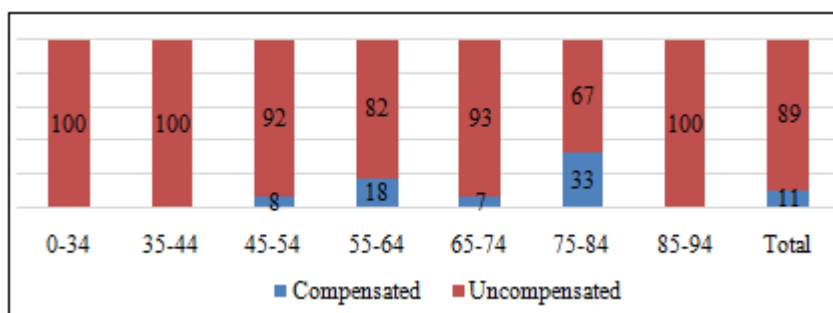


Figure 6: Compensation levels according to age

Source: Own elaboration based on database obtained from CESFAM Juan Pablo II.

Figure N°6 shows that, when separated by age, there is a predominance of decompensated patients in all age groups with at least 65% in each group, being worse in patients of extreme ages with 100% decompensation in patients under 45 and over 85 years of age. This phenomenon has been studied by Pagès-Puigdemont and Valverde-Merino (2020), who determined that the younger the patient, the lower the adherence to treatment. While in older patients there is a greater burden of disease associated with cognitive

impairment, which makes adherence more difficult involuntarily, decreasing in both cases the likelihood of achieving the established goals¹³.

4. Conclusions

The data obtained on the proportion of patients at Cardiovascular Risk in the population analyzed coincide

with the available literature, in which patients at High Cardiovascular Risk predominate.

The proportion of decompensated patients in the sample analyzed exceeded 88%, an alarming figure that, although it has limitations in its analysis, which will be detailed later, demonstrates the insufficient cardiovascular control in our national territory.

Women have worse levels of compensation than men, probably attributable to poorer medical follow-up due to cultural patterns. When the three main pathologies included in the CVCP are grouped together, patients with dyslipidemia have proportionally better levels of compensation, followed by those with hypertension and finally diabetics.

Elderly patients tend to fail to achieve the established therapeutic goals, secondary to difficulties in adhering to pharmacological and/or non-pharmacological treatments.

5. Future Scope

One of the limitations of our study is the small number of participants analyzed, which only corresponds to 14% of the patients in the original database, since the rest did not meet the necessary criteria to be included in the analysis.

Even so, our study allows us to make a descriptive diagnosis of what is happening with the patients of the PSCV of the CESFAM JPII of La Serena, being a starting point to redirect the approaches of the patients of the program, improving the frequency of controls, the awareness of the patients about their pathologies and the promotion of healthy lifestyles.

Finally, based on the data found and discussed in this study, it is possible to begin to devise new interventions to improve the response to treatment and have a positive impact on the health of patients in the cardiovascular health program at the local and national level.

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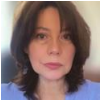
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