# Technical cooperation: "Implementation of the ECHO methodology in three Latin American and Caribbean countries"
# ATN-/JF-18098-RG

# Report of pre-test results of the evaluation form developed with CEDIA[1]

## 1 Introduction

This report presents the results of a pre-test conducted to validate the evaluation tool developed by ECHO Udelar jointly with CEDIA, its technical counterpart. During the period available for the pre-test, we received 18 responses; although this number was enough to validate the tool, it failed to provide sound information applicable to the universe of cases. The pre-test shows high consistency in the scales applied, and significant differences between the values at baseline and the impact line. Its full version is available in Annex 1. This tool is now ready to be applied to evaluate the 2024 teleclinic program.

## 2 Summary of the methodological strategy of the evaluation

### 2.1 CEDIA

In the case of CEDIA, we applied the evaluation model used to measure an impact proxy. For the short-term evaluation of clinics, ECHO uses a tool validated by ECHO New Mexico for the Hepatitis C Clinic[2] in its general design. The model applied in Uruguay included an adaptation determined by the specificity of each clinic, using local terminology (Giachetto, et al., 2019). This is a sort of "performance evaluation" that analyses the continuous performance of a process against target values; hence, we use an analytical approach. In general terms it involves analysing a group of indicators at their current value and relating them by comparing them against the value of that same indicator in an earlier period, against targets

[1] CEDIA: Corporación cuatoriana para el desarrollo de la investigación y academia

[2] Arora, S., Kalishman, S., Thornton, K., Dion, D., Murata, G., Deming, P., Pak, W. (2010). Expanding Access to HCV Treatment - Extension for Community Healthcare Outcomes (ECHO) Project: Disruptive Innovation in Specialty Care. *Hepatology (Baltimore, Md.)*, *52*(3), 1124-1133.http://doi.org/10.1002/hep.23802.

defined by the plan, program or project, against another operating unit, area, or agency, and against normative or customary parameters. Alternatively, ECHO measures part of these variables by applying validated self-perception scales to the clinical personnel. These scales are an excellent tool for measuring the primary effects of the intervention; they are also a reasonable "proxy" for measuring outcomes and eventually impacts.

**Categories of analyses, variables and indicators**

The variables we are working with consist of 4 dependent variables and 5 independent variables.

**Dependent variables**

The main dependent variable is increase in competencies and capabilities. This variable is measured through the 13 indicators below.

1. Ability to identify patients.
2. Ability to diagnose the health conditions addressed at the teleclinics.
3. Ability to raise possible differential diagnoses.
4. Ability to implement a comprehensive approach identifying medical and psychosocial problems, assessing to what extent they can be solved.
5. Ability to identify when and why to consult a specialist.
6. Ability to identify the laboratory tests required to reach a diagnosis.
7. Ability to understand the results of laboratory tests.
8. Ability to know the therapeutic options available and their side effects.
9. Ability to coordinate and implement referral and counter-referral of patients.
10. Ability to identify problems related to clinical management and propose solutions in the participant's area of performance.
11. Ability to involve the families in the care of patients.
12. Ability to transfer knowledge to the territory's health team.
13. Ability to serve as a local consultant

Although these indicators refer to abilities, the measurement of self-confidence or self-sufficiency may be considered implicit across these categories, that is, when measured through self-perception, the higher the value of the indicators, the greater the person's self-confidence. These indicators are measured using a 5-value Likert scale, which measures two moments in the process, i.e., before starting ECHO and upon answering the survey. In this sense it is a retrospective measurement. The values are 1= No ability; 2= Limited knowledge or ability; 3= Average ability versus my peers; 4= Competent; 5= Expert, I teach others.

The second dependent variable is satisfaction with the project on a personal level.

Being satisfied with a certain training and mentoring activity can be a proxy of outcomes for a project of these characteristics. In this case it is measured based on five indicators:

1. Cost - benefit of the time the participant spends in the teleclinic (evaluation of the usefulness of the time spent in ECHO in relation to the outcomes).
2. Integration into a learning community by expanding the participants' personal network (perception of their incorporation into the community).
3. Improvement in the quality of work (overall impact on practice).
4. Balance between instruction and practice (Relationship between two aspects of the activity).
5. Overall satisfaction (Overall assessment of the project)

These indicators are measured using a 5-value Likert scale that measures the current perception. It is not retrospective. The values used are 1= strongly disagree, 2= disagree, 3= neutral, 4= agree, 5= strongly agree.

The third dependent variable is: Effects of ECHO on personal practice.

This variable is measured with four quantitative indicators.

1. Changes in the clinical guidelines used.
2. Changes in the relationship with patients.
3. Changes in the relationship with colleagues.
4. Increased personal participation in the definition of policies in the service.

These indicators are measured using a 5-value Likert scale, which measures the current perception. It is not retrospective. The values used are 1= I have not implemented any changes; 3= neutral, 5= I made a relevant change. Intermediate values are not labelled.

The fourth dependent variable is Identification of barriers to change practice.

This variable is measured with 4 quantitative indicators.

1. Insufficient knowledge.
2. Insufficient skills.
3. Lack of support from co-workers.
4. Lack of support from management.

These indicators are measured with a 5-value Likert scale, which measures the current perception. It is not retrospective. The values used are 1= Not a relevant barrier; 3= neutral, 5= Important barrier. Intermediate values are not labelled.

**Independent variables**

The independent variables are as follows:

1. Level of participation in ECHO. You are asked to state the total number of sessions in which you participated in absolute numbers.
2. Profession. A menu of options is defined based on the teleclinic.
3. Specialty. Like the above variable.
4. Age.
5. Years of professional practice.
6. Gender.

**Analysis Plan**

Prior to the analysis, all the scales were tested for reliability using Cronbach's Alpha reliability coefficient[3]. In previous evaluations conducted by ECHO the "Alpha" of these scales ranged from .78 to .98. The baseline and the impact line means are then compared using Student's t-value, working with a *p* value= α 0.05 and with a 95% confidence interval. Indices are constructed to summarize the impact and they are calculated for the three dependent variables that support this procedure. The results are expressed on a 100 basis. Apart from the interval analysis, the 13 indicators are treated as categorical variables, and the percentage distribution of the evolution of each one is analysed separately.

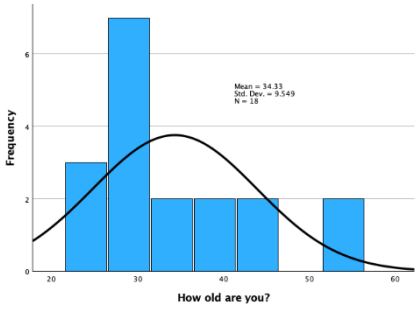
## 3 Presenting CEDIA's pre-test results in Ecuador

### 3.1 Preliminary considerations

Web survey forms were sent to the personal e-mail address of each participant registered in the monitoring databases of each clinic. After successive mailings, only 18 responses were obtained; this is equivalent to almost 1% of the universe registered (1959 participants).
The demographic and professional data below provide an overview of the profile of responders.

[3] Cronbach's Alpha values**:** 0 to 0.2, minimal; 0.2 to 0.4, low; 0.4 to 0.6, moderate; 0.6 to 0.8, good; 0.8 to 1, very good; 1, perfect.

**Chart 1. Total number of participants registered by year and country**



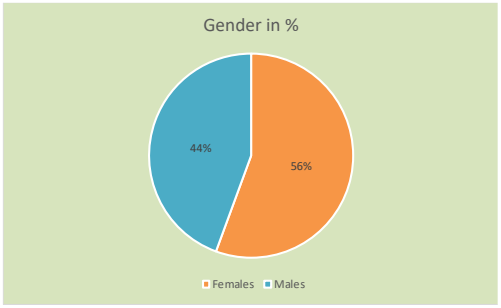
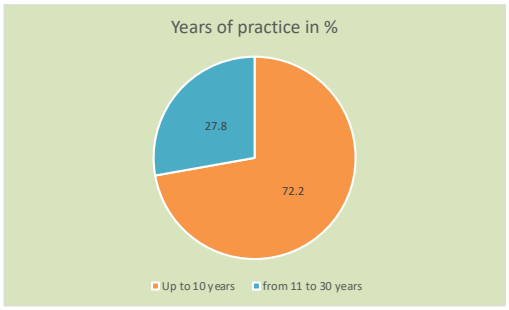
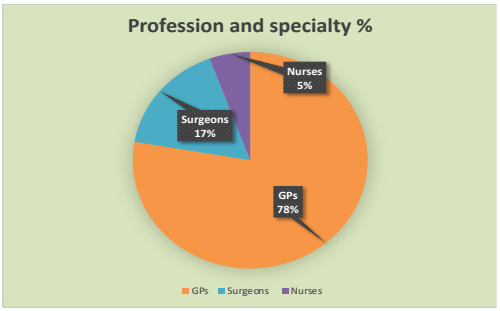




**Chart 2. Specialties and years of practice**

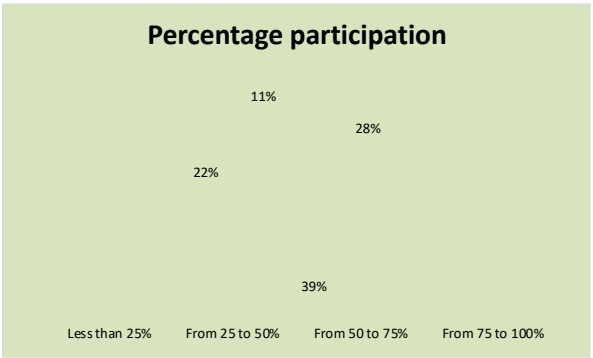



The average age of the health care professionals was 34 years; 72% had been practicing for less than 10 years and 78% were general practitioners. The distribution by gender shows 56% were females.

A relevant data that is consistent with measurements made in other contexts is the participation in teleclinic sessions. In the different measurements, we start seeing an impact following the individual's first sessions. In general, there is a specific type of participation, linked to the focus of interest of each professional. Another type of more intense participation is that of professionals who connect systematically on a regular basis. Finally, in all cases, there is always a group that participates in more than 75% of the sessions. This latter group accounts for 11%, which is an acceptable level, comparatively.

**Chart 3. Participation in teleclinic sessions**



### 3.2 Analysis of the overall impact of the project

We started with the analysis of the Increased competencies, capabilities, and self-confidence variable in the 13 indicators, managing the data globally.

A reliability analysis was conducted to check the validity of the scale. First, we measured the consistency of the scale before and after participating in ECHO. Cronbach's Alpha reliability coefficient was 0.970 before ECHO and 0.978 after ECHO. Given that Alpha was very high in both cases, the reliability of both scales was considered assured.

Next, we compared the means of two related samples based on the hypotheses: a) $H_0$ was that the indicators measured would show no significant differences between the means of perceived increase in competencies and skills of the participants before and after participating in ECHO Clinics. $H_1$ = the indicators measured would show significant differences between the means of perceived increase in competencies and skills of health care workers before and after participating in ECHO Clinics. After confirming that the variables have a normal distribution, we worked with a P-value= α 0.05 and a confidence interval of 95%.

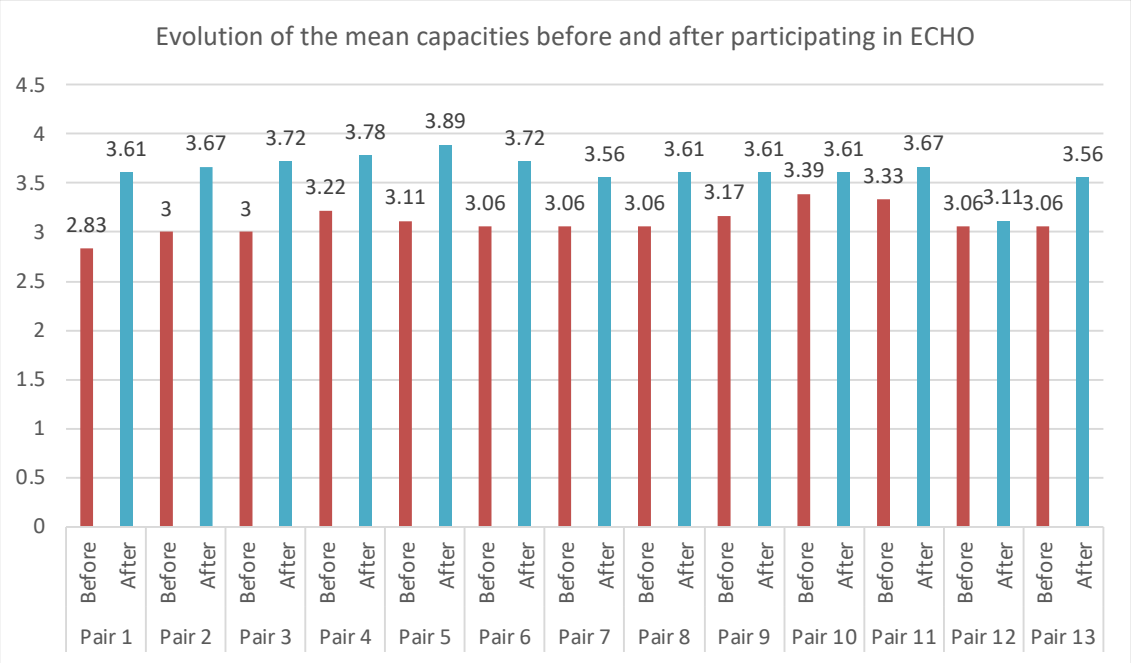
As we can see in the table below, all indicators show an increase between both periods. The results of the related samples test using Student's t-test show that 11 of the indicators show a significant *P* value. The difference is not significant in the indicators linked to the capacities to involve the patient's family, and the capacities to transfer knowledge to the territory's health team. In the short term, this impact is consistent in most of the indicators, suggesting that the level of difficulty and use of each component of the process has had a balanced distribution except in some indicators that point to more complex capabilities. As we compare these results with the evaluations conducted in Uruguay, we find reasonable similarities, especially in teleclinics involving the first level of care.

**Table 1. Related sample statistics**

| Capabilities to be strengthened through training. | | Mean | SD | Sig. P value |
|---|---|---|---|---|
| Pair 1 Ability to identify patients. | Before | 2.83 | 0.778 | 0.001 |
| | After | 3.61 | 0.985 | |
| Pair 2 Ability to diagnose the health conditions addressed at the teleclinics. | Before | 3 | 0.686 | 0.003 |
| | After | 3.67 | 0.84 | |
| Pair 3 Ability to raise possible differential diagnoses. | Before | 3 | 0.826 | 0.001 |
| | After | 3.72 | 0.84 | |
| Pair 4 Ability to perform a comprehensive approach identifying medical and psychosocial problems, assessing their solvability. | Before | 3.22 | 0.808 | 0.004 |
| | After | 3.78 | 0.943 | |
| Pair 5 Ability to identify when and why to consult a specialist. | Before | 3.11 | 0.758 | 0.001 |
| | After | 3.89 | 0.963 | |
| Pair 6 Ability to identify the laboratory tests required to reach the diagnosis. | Before | 3.06 | 0.895 | 0.002 |
| | After | 3.72 | 0.802 | |
| Pair 7 Ability to understand the results of laboratory tests. | Before | 3.06 | 0.984 | 0.012 |
| | After | 3.56 | 0.873 | |
| Pair 8 Ability to know the therapeutic options available and their side effects. | Before | 3.06 | 0.778 | 0.004 |
| | After | 3.61 | 0.802 | |
| Pair 9 Ability to coordinate and perform referral and counter-referral of patients. | Before | 3.17 | 0.778 | 0.021 |
| | After | 3.61 | 0.924 | |
| Pair 10 Ability to identify problems related to clinical management and propose solutions in the participant's area of performance. | Before | 3.39 | 0.778 | 0.052 |
| | After | 3.61 | 0.916 | |
| Pair 11 Ability to involve the families in the care of patients. | Before | 3.33 | 0.84 | 0.094 |
| | After | 3.67 | 1.029 | |
| Pair 12 Ability to transfer knowledge to the territory's health team | Before | 3.06 | 0.9 | 0.334 |
| | After | 3.11 | 0.938 | |
| Pair 13 Ability to serve as a local consultant. | Before | 3.06 | 0.984 | 0.017 |
| | After | 3.56 | 0.938 | |

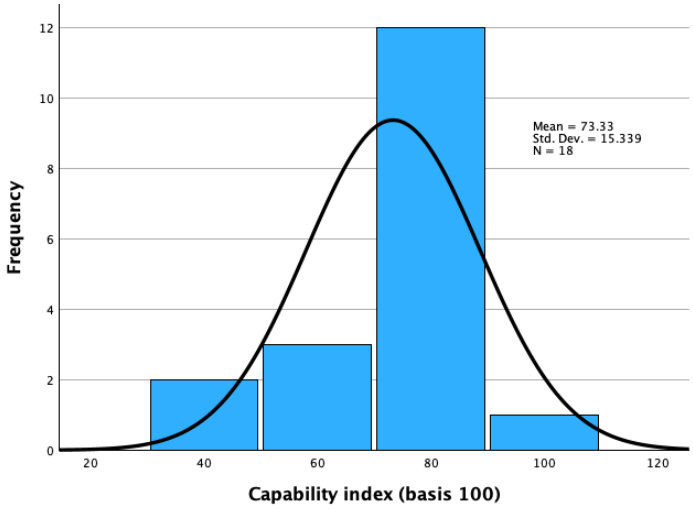
Although redundant, in the following graph we present an overview of the impact on the 13 pairs of indicators. The analysis of the means shows an increase in self-perceived skills. This points to two objectives of the project, firstly to improve the training of professionals linked to ECHO, considering that this impacts on the quality of life of patients and their immediate surroundings, and secondly to increase the professionals' self-efficiency, updating their knowledge on the one hand, and enhancing confidence in their competencies and skills on the other. This allows the system to be reproduced.

**Chart 4. Self-perception of skills and competencies. Evolution (means)**




As we have a highly reliable scale with 13 indicators, we will develop an index to reflect the increased capabilities, competencies and self-sufficiency based on the average of the means of the 13 items for each case. Only the final measurement ("after ECHO") will be considered for that purpose.

**Chart 5. Capabilities index expressed as % of total index**



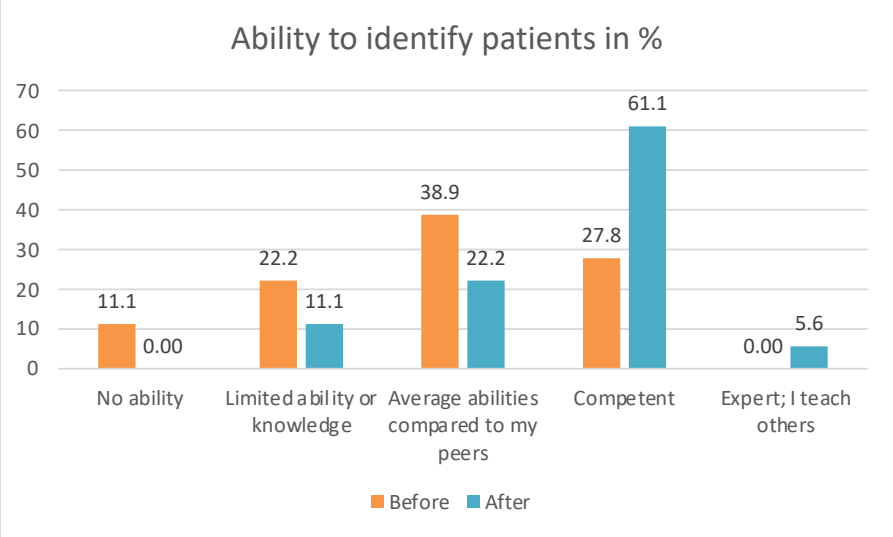

The results indicate that the participants' mean reaches 73% of the maximum possible capabilities, which is a very good value, considering that we have no cases below 40% of the maximum value.

### 3.3 Analysis of the specific distribution of each indicator

Beyond the significant impact already confirmed, it is important to analyze some more specific aspects of the evolution of self-perception based on a percentage analysis of the behaviour of each indicator surveyed. So far we have worked with mean values. Now we will treat all indicators as categorical variables.

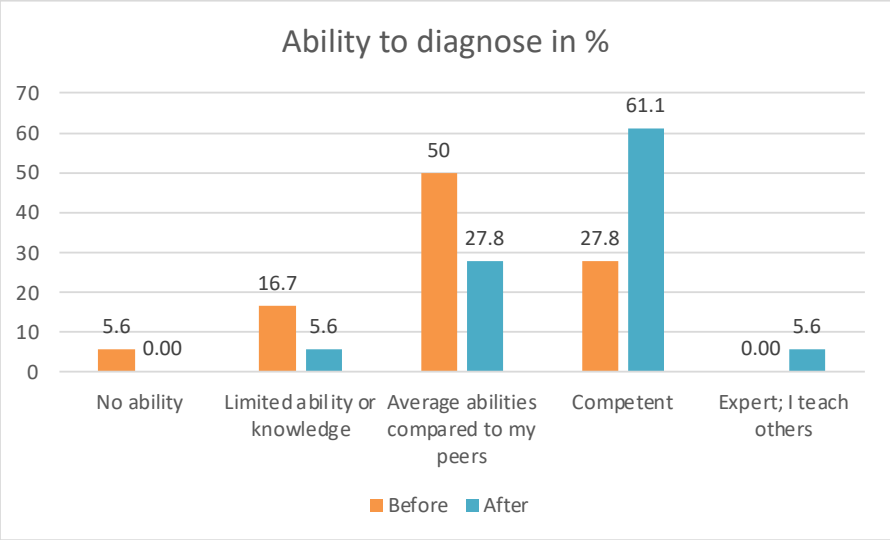
In pair 1 we analysed the indicator "ability to identify patients". If we look at the chart below we find that the negative and neutral values decrease and the positive values increase, with an emphasis on value 4. This is one of the skills that typically poses less challenges in the training we implemented. The level of competency almost doubles. This not only implies the incorporation of capabilities but also an increase in self-confidence.

**Chart 6. Self-perception of skills and competencies. Evolution of PAIR 1 (%)**



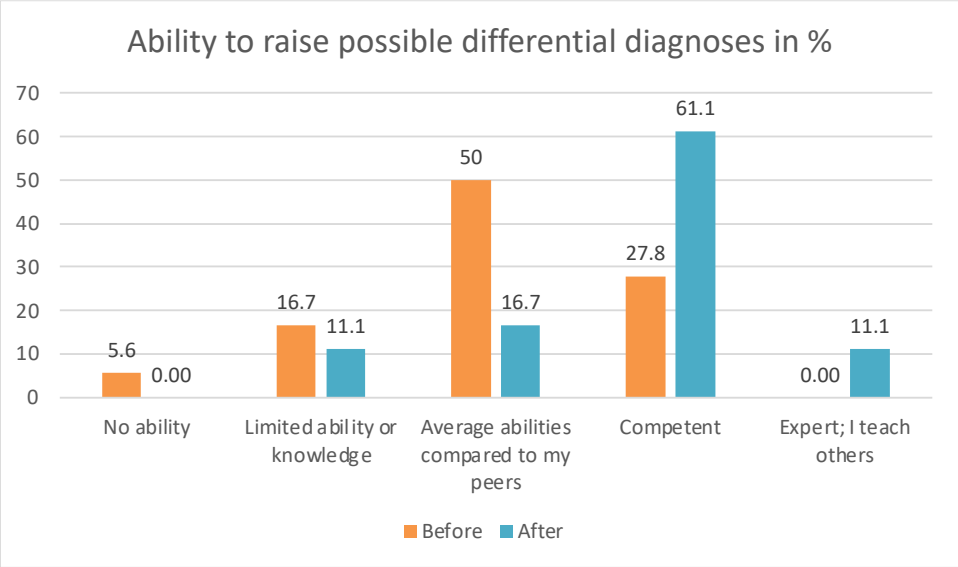

The second pair is related to the ability to make a diagnosis. The distribution evolves similarly to Pair 1 for positive values and is lower for negative values.

**Chart 7. Self-perception of skills and competencies. Evolution of PAR 2 (%)**



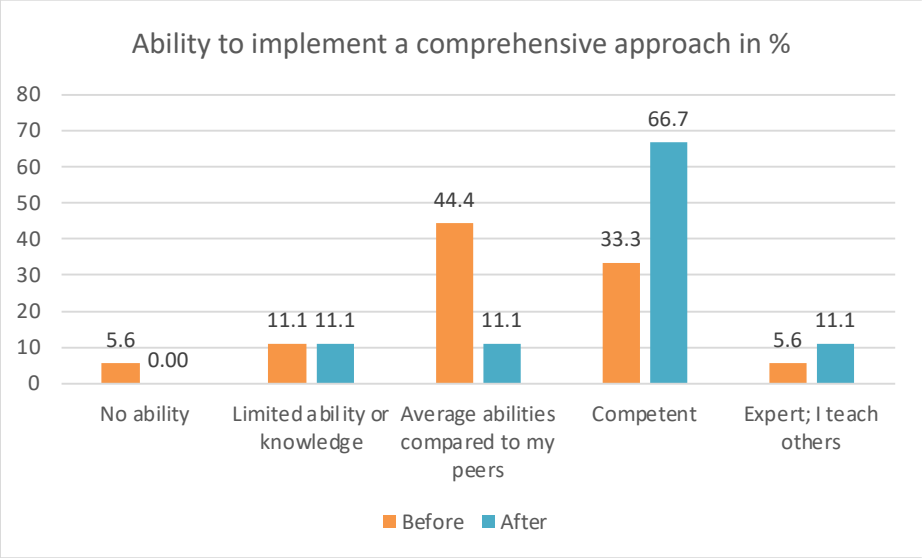

The third pair works on the ability to suggest potential differential diagnoses. This indicator shows a distribution similar to the previous ones with an increase in the highest value (expert).

**Chart 8. Self-perception of skills and competencies. Evolution of PAIR 3 (%)**



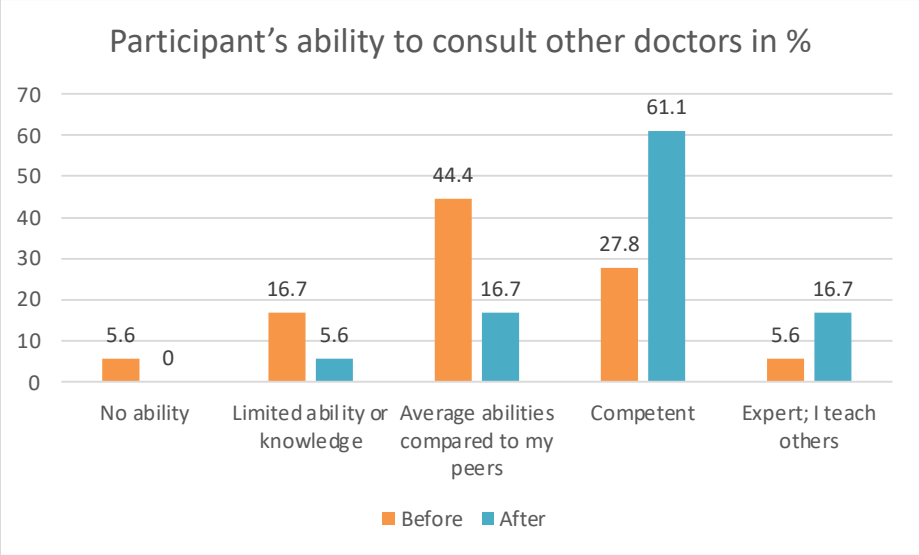

Pair four analyses the indicator linked to the capacity to use a comprehensive approach identifying medical and psychosocial problems. In this indicator, 11% still have limited capabilities; the neutral values drop substantially, and the level of those marked as "competent" doubles.

**Chart 9. Self-perception of skills and competencies. Evolution of PAIR 4 (%)**



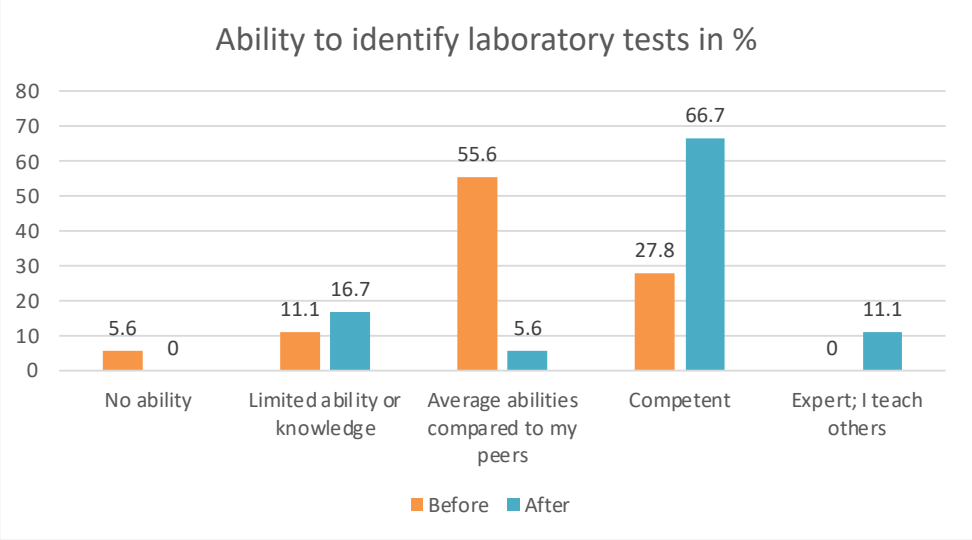

Pair five is related to the ability to identify when and why a consultation with a specialist is warranted. Although the previous trends are maintained with nuances, there is a notable increase of those considered experts.

**Chart 10. Self-perception of skills and competencies. Evolution of PAIR 5 (%)**



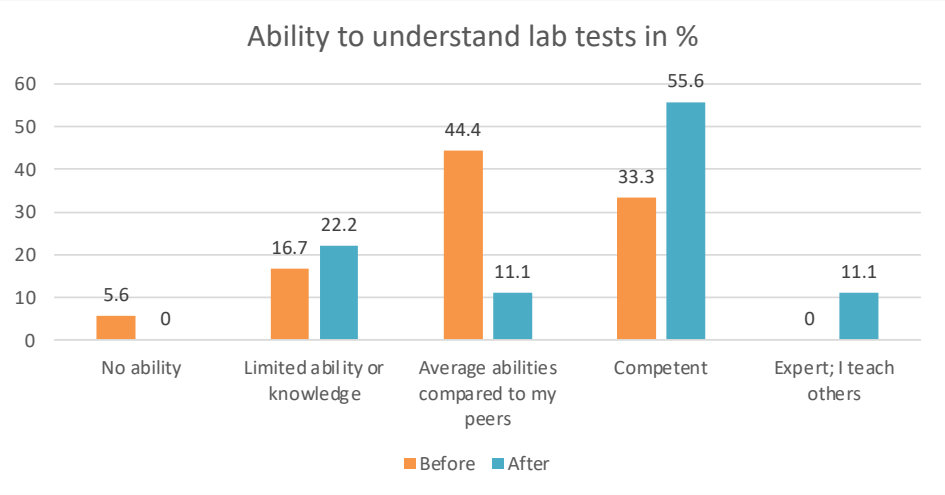

The sixth pair refers to the ability to identify the laboratory tests required. This indicator shows a slight shift in the negative values; the neutral value drops by 50 percentage points, and the positive values increase consistently with the previous indicators.

**Chart 11. Self-perception of skills and competencies. Evolution of PAIR 6 (%)**



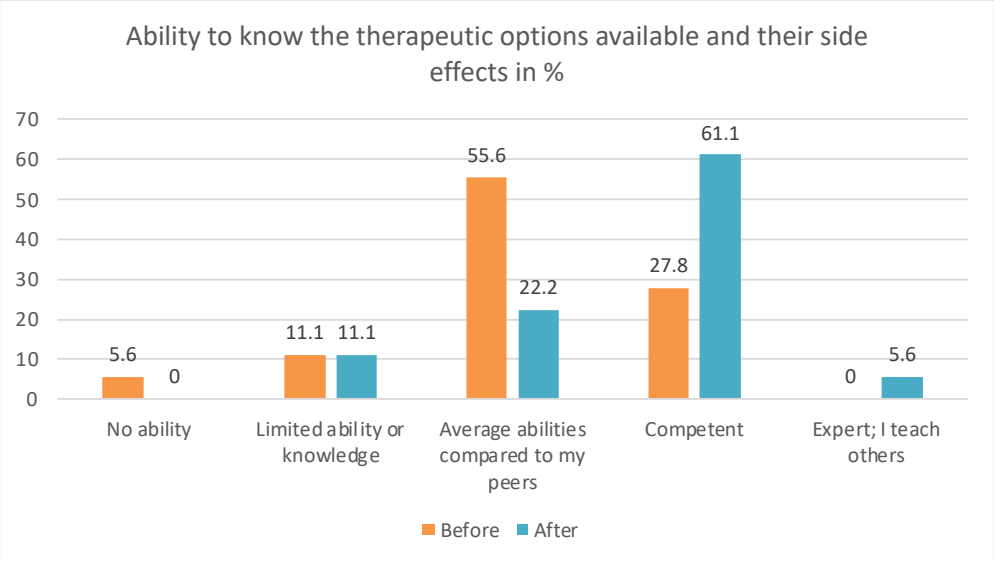

Pair 7 is related to the previous pair. It measures the increase in the ability to understand the results of laboratory tests. There is a small improvement in the negative values and a smaller increase in the positive values. In general, something similar happens in teleclinics in other contexts. Understanding the results is more complex than the ability to identify which test is relevant.

**Chart 12. Self-perception of skills and competencies. Evolution of PAIR 7 (%)**



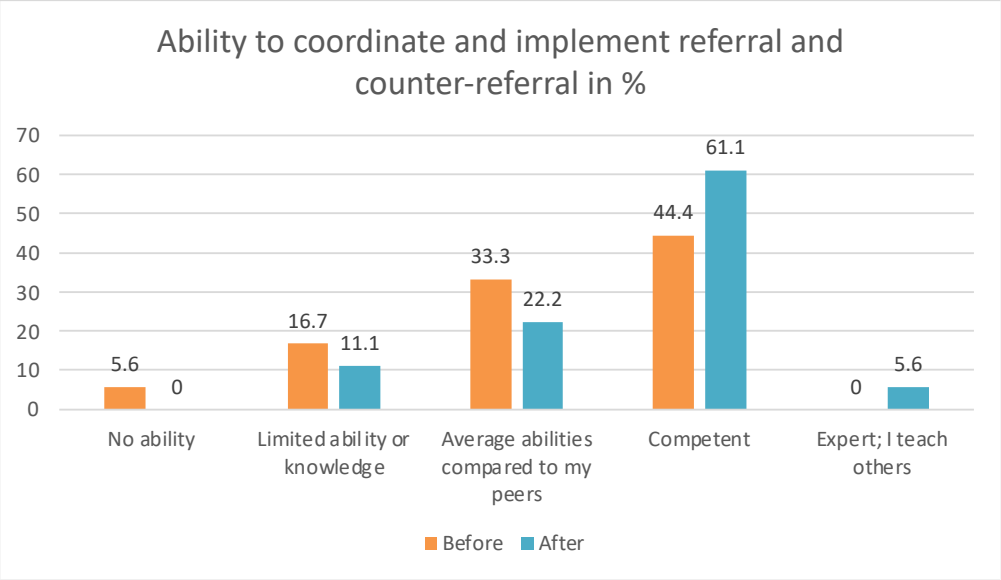

The eighth pair refers to the ability to know the therapeutic options available and their side effects. This distribution shows a prevalence of positive values and an evolution of the capabilities centered on the "competent" value.

**Chart 13. Self-perception of skills and competencies. Evolution of PAIR 8 (%)**



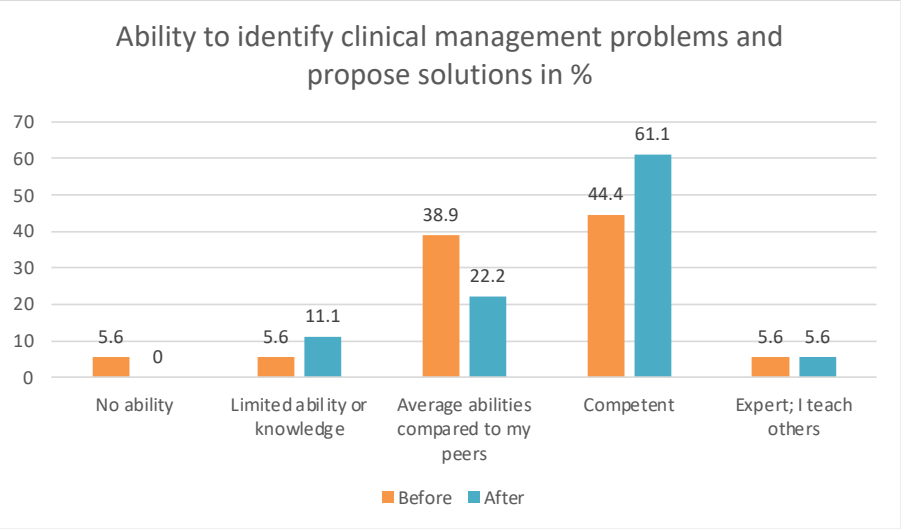

Pair 9 refers to the capacity to coordinate and carry out referral - counter-referral. The high positive values are maintained throughout the evolution.

**Chart 14. Self-perception of skills and competencies. Evolution of PAIR 9 (%)**



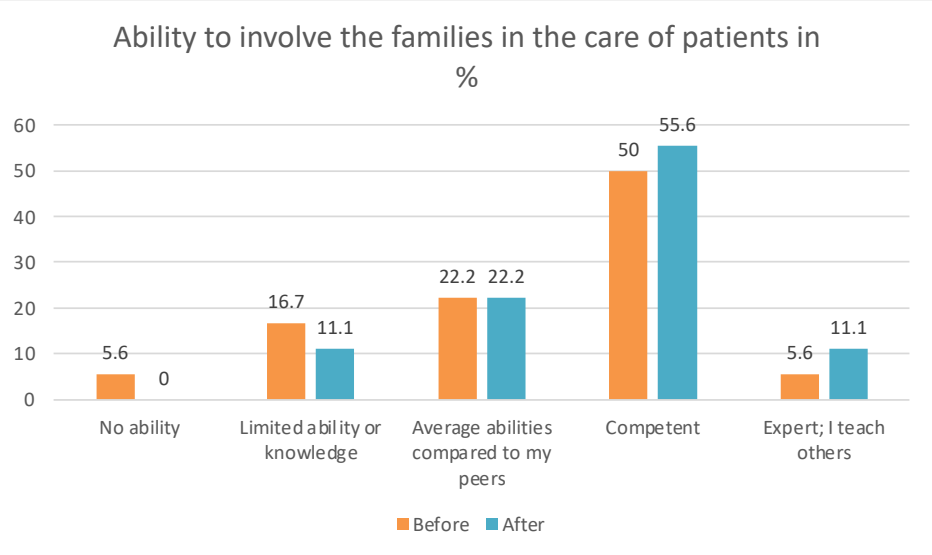

Pair 10 deals with the ability to identify problems related to clinical management and the ability to propose solutions. Here the evolution is similar to the evolution observed with the previous indicator.

**Chart 15. Self-perception of skills and competencies. Evolution of PAIR 10 (%)**




Pair 11 measures the increased ability to involve the family in the patient's care. This is a key indicator in the ECHO model. The initial analysis already showed no significant differences in this indicator. The Chart below shows that 50% of the participants were assessed as "competent" at baseline, and the increase is very small after the intervention. The same holds true for "experts".

**Chart 16. Self-perception of skills and competencies. Evolution of PAIR 11 (%)**




**Indicators 12 and 13 are taken as "proxies" for "self-confidence". The indicator measures the capacity to provide the health team on the territory knowledge about the conditions addressed, on the one hand, and the capacity to serve as local consultants, on the other. This not only requires the local health team to be knowledgeable and updated; they also need a certain level of self-confidence so they can put this level of knowledge into play with their peers at the most horizontal level. In indicator 12 there are no significant differences, and the negative, neutral**

**and positive values remain constant with a totally different distribution than the rest of the indicators. Indicator 13 shows the same trend, although the difference is significant. The increase in the expert's value is notorious in this case. In both cases, they behave different from what we have seen in evaluations conducted in other contexts. We do not have information as to what could be the cause.**

**Chart 17. Self-perception of skills and competencies. Evolution of PAIR 12 (%)**

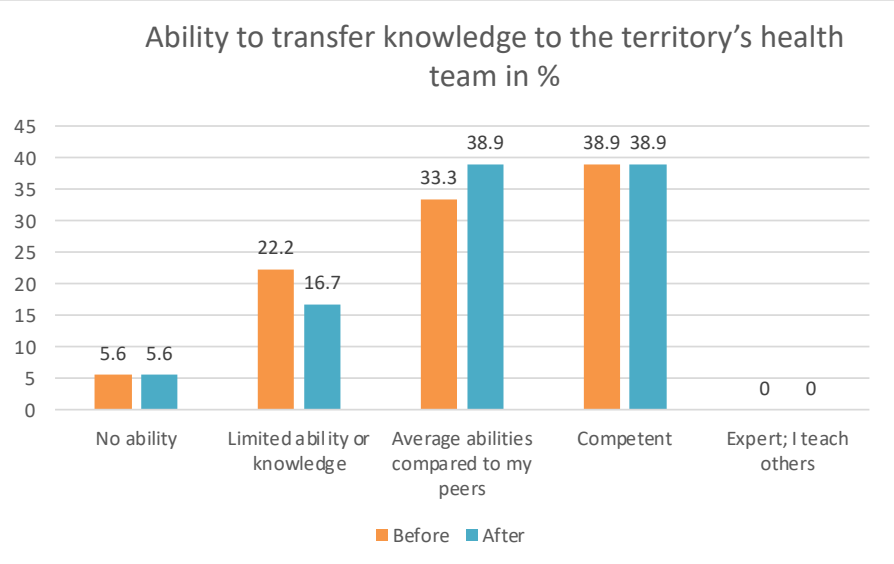
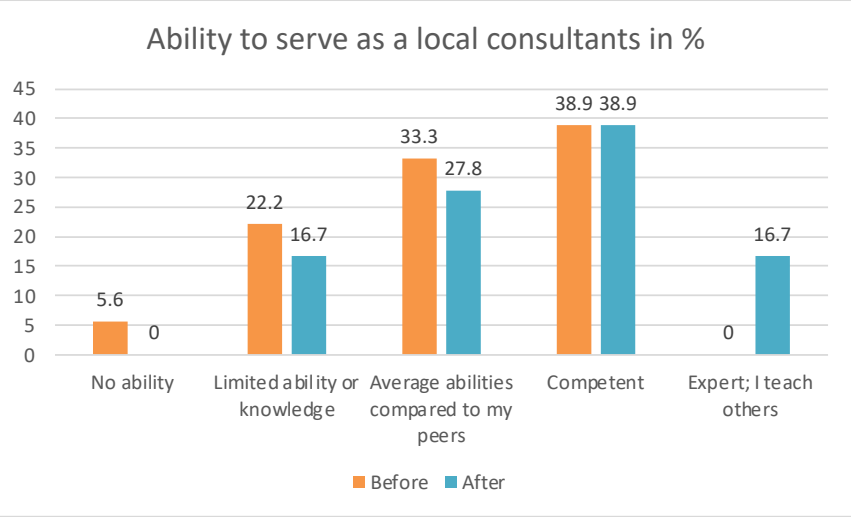



**Chart 18. Self-perception of skills and competencies. Evolution of PAIR 13 (%)**

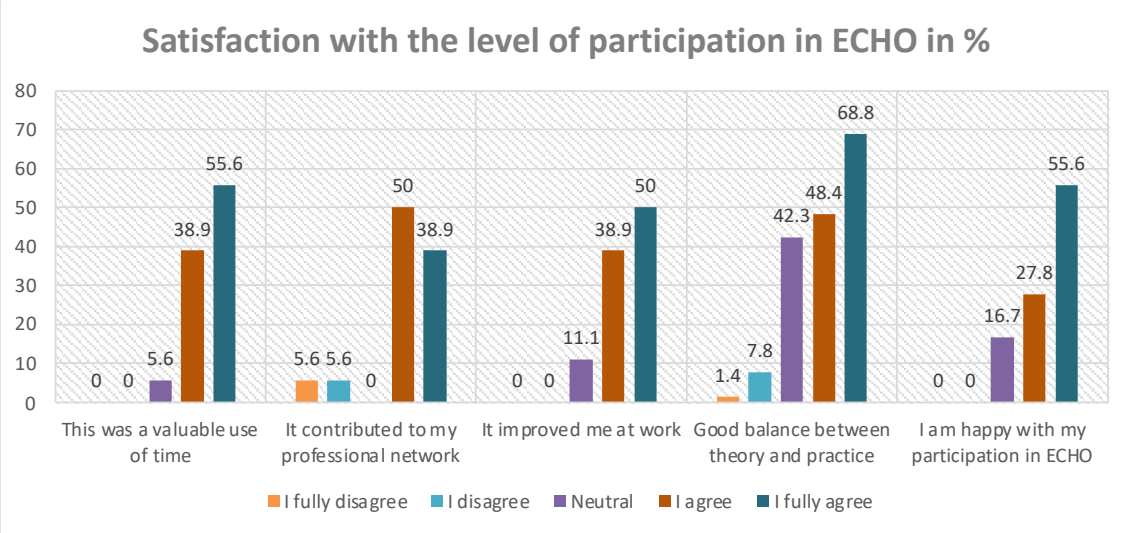



## 3.4 Satisfaction with the project on a personal level

The level of satisfaction with the outcomes of the training and mentoring activity at the individual/personal level was surveyed based on 5 indicators. In all indicators the highest value is the most frequent, with few or no negative values. There is an excellent level of satisfaction with the balance between the theoretical and hands-

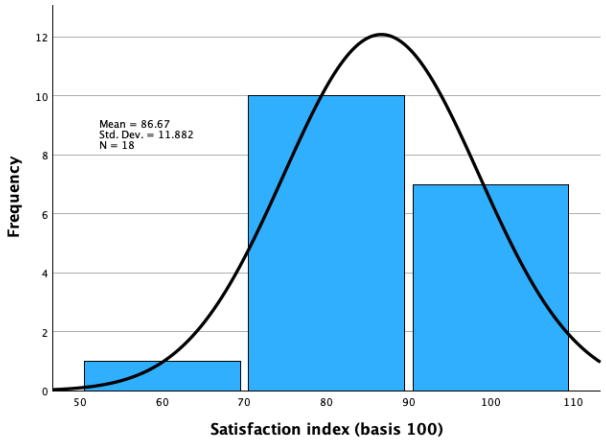
on components of the teleclinics; the use of the time dedicated to these activities is highly valued.

**Chart 19. Personal satisfaction indicators**




To have a summary measure of personal satisfaction, a reliability test was carried out to verify that the 5 indicators constitute a scale. With a Cronbach's Alpha reliability coefficient of 0.829, we can affirm that the scale is highly reliable. Based on this we constructed a personal satisfaction index using the average of the means of the 5 items for each case. The satisfaction index as a % of the maximum possible value gives an average of 86.67%, which implies a very high level of satisfaction, especially considering that most cases are concentrated between 80 and 100%.

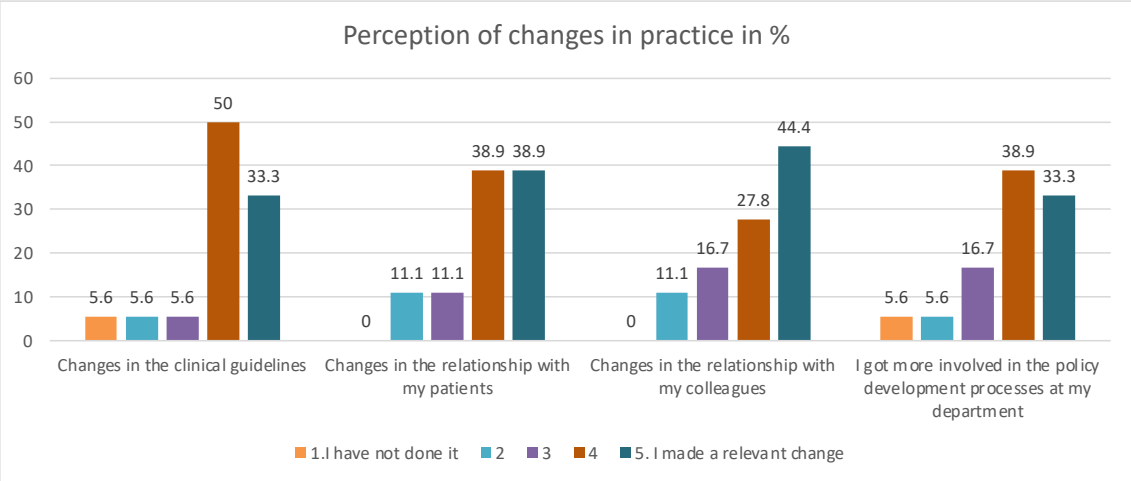
**Chart 20. Distribution of the personal satisfaction index**



## 3.5 ECHO's impact on personal and collective practice

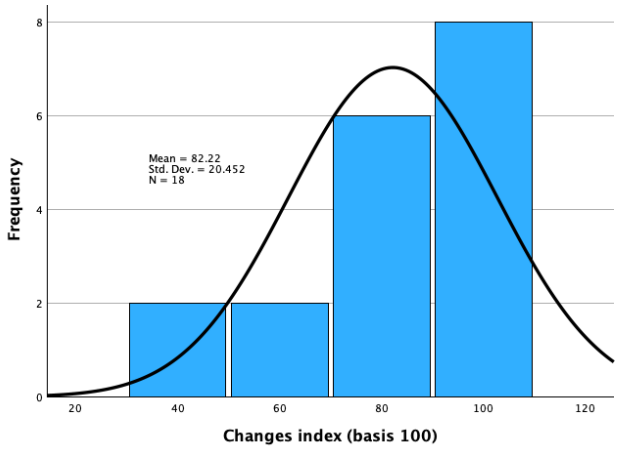
The impact of ECHO on the concrete practice of the participants was measured through four indicators. The data suggest that the indicators differ in their distribution. The highest level corresponds to the change in the use of clinical guidelines. If we add up the highest positive values, the positive values of all indicators are close to 80%. This is a good outcome, as it shows a reasonable relationship between the self-perception of increased capabilities, the perception of changes in practice, and satisfaction with the activity.

**Chart 21. ECHO's impact on personal practice**




A reliability test was conducted to check that the four indicators constitute a scale that would give us a summary measure of personal satisfaction. With a Cronbach's Alpha reliability coefficient of 0.958, we can claim that we have a very reliable scale. We then put together a personal satisfaction index based on the average of the means of the 4 items for each case.

**Chart 22. Rate of change in practice as % of the maximum**

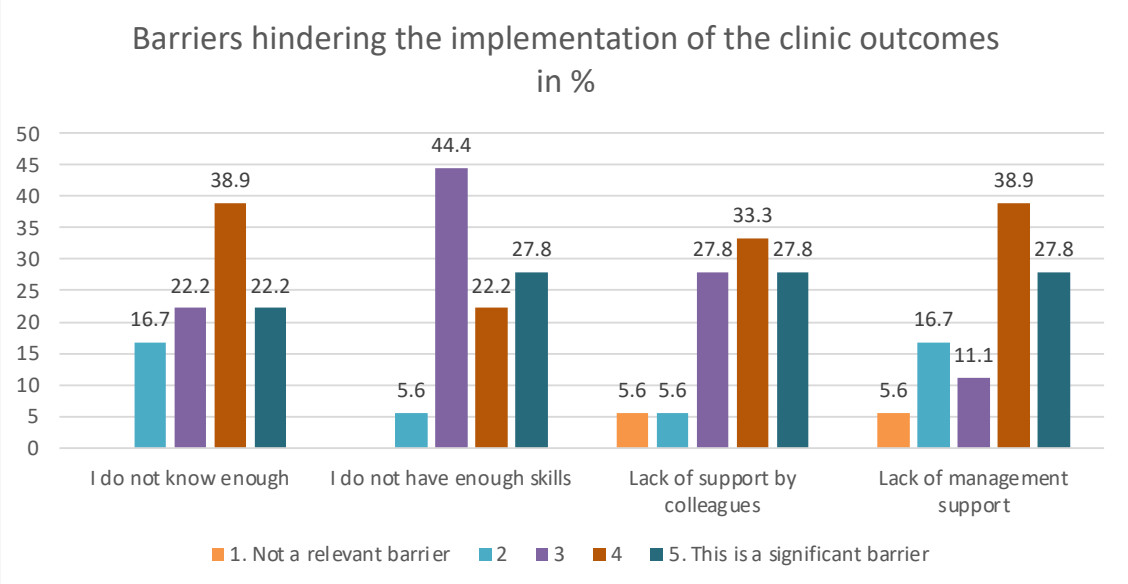


The index of changes in % of the maximum possible value yields an average of 82%, which implies a high level of changes; its distribution is more scattered than that of the previous indexes.

### 3.6 Identification of barriers to implement practice changes

Finally, we tried to detect any barriers that could hinder an ECHO participant from changing practice and generating changes. The chart below shows that there is a barrier related to skills, it is perceived as less important than the others. Among the barriers that are perceived as important, the lack of support from management and co-workers rank first. This element had already been seen in previous studies and it has even been observed in qualitative studies. When health care professionals join an ECHO learning community, they begin to work in a horizontal and collaborative environment that cannot always be reproduced at the workplace. On the other hand, the different organizational forms operating in the territory do not always generate spaces for the implementation of changes to the model of care and clinical management. Lastly, the barrier of insufficient knowledge is raised with less intensity. This barrier is not common in previous studies, and it is probably associated with the specific profile of the group evaluated here.

**Figure 23. Identification of barriers to implement changes in practice**



### 3.7 Conclusions

The following are the main conclusions drawn from the pre-test assessment of the project evaluation form developed with CEDIA.

1. The form performed well in terms of accessibility, comprehensibility, and completion time. There were no systematic filling errors or relevant inconsistencies. The form should be improved in terms of dissemination and, in general terms, in gathering responses. We need to increase the intensity of our outreach to motivate participants to participate in the process.
2. In this case, the performance of the scale was just as reliable as the original model and its successive applications. The retrospective analysis of the indicators showed significant differences in 11 of the 13 indicators, and the indices that had been developed were validated.
3. We recommend incorporating this form into CEDIA's toolkit and to use it on an annual basis to assess capabilities.