

## Directed Imagination: A Procedure for Improving Self-concept in Persons with Leprosy

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### Abstract

**Background:** From the perspective of the Roy Adaptation Model, leprosy is seen as a focal stimulus with severe psychological repercussions that force persons to modify their behavior in order to avoid being rejected by the social stigma the disease creates, thus inducing in them an ineffective adaptive response of the self-concept mode. The aim of the present work was to describe the effect of the directed imagination technique at the adaptation level of the self-concept mode in persons with leprosy in Colima, Mexico during 2012.

**Methods:** A quantitative study with a pre-experimental, longitudinal, and protective design was conducted. The sample was made up of 24 persons that were given a before-and-after self-concept test using the Viveros 03 instrument, which has a Cronbach's alpha reliability coefficient of 0.8581. The technique of directed imagination was employed; this procedure promotes the adoption of desirable behavior through exercising the imagination. The Wilcoxon's signed-rank test was used for confirming effectiveness and a  $p \leq 0.05$  was regarded as a statistically significant value.

**Results:** The resulting adaptation levels found in the self-concept mode were the following: in the pre-test, the integrated level was 91.7% (n=22); in the post-test the integrated level rose to 95.8% (n=23). The difference between both tests was significant ( $p= 0.007$ ).

**Conclusion:** Based on these results, we conclude that the technique of directed imagination increased the adaptation level score of the self-concept mode in persons presenting with leprosy in Colima.

**Keywords:** Directed imagination; Self-perception; Leprosy; Nursing; Mexico

### Introduction

The simulation modeling technique is based on the theory of social learning. Cautela pioneered this method with these two aims: the acquisition of new behavior and the elimination of inappropriate behavior. The technique consists of an imagined observation of a performance utilizing a model, and the consequences thereof [1].

The first scientific reports on this technique identified its effect on the development of assertive conduct, in cases of excessive alcohol consumption and obsessive compulsive behavior, children afraid of going to the dentist, and children that isolated themselves during free play at recess; the technique was employed for developing assertive conduct and there were favorable changes in the individuals that used it [2-5].

Variations have been made to the original simulation modeling that include directed imagination and self-hypnosis through images, all of which share the aim of promoting assertive conduct in individuals. Imagination is understood as the capacity of persons to form mental images based on their self-concept that are related to something they have never really experienced themselves, but that, to a great extent, is a product of their inner world [6].

Directed imagination has been used to reduce anxiety and depression and to increase self-esteem in primiparous mothers during the first 4 weeks post-partum, the distress prior to childbirth in primiparas, and in older adults that have a fear of falling [7-9].

Self-hypnosis has also been employed for reducing anxiety during dermatologic procedures and ameliorating the hot flashes that are a significant problem for some postmenopausal women. All the studies reported effective results in relation to their respective analyses [10].

The directed imagination technique is obviously a cognitive behavioral strategy that can be used in different clinical situations; these encompass the infectious diseases that are contagious and that affect self-concept, and leprosy is included among them.

Leprosy modifies the well-being of persons presenting with the disease by affecting their physical, psychological, social, and economic development [11,12]. The deteriorated quality of life and affected mental health of patients with leprosy are related to a low level of education and a reduced annual income [13-16].

The stigma that accompanies patients with leprosy has 2 causes: on the one hand, societal prejudice and rejection, and on the other, the conspicuous tendency the patients have to isolate themselves. Both factors are the fundamental elements that contribute to the lack of treatment adherence and the consequent greater disability in patients presenting with chronic disease [17-20].

Based on the above and considering all the effects leprosy causes in an individual, this study, conducted from the nursing perspective, attempted to describe the effect of the directed imagination procedure on the level of adaptation of the self-concept mode of the Sister Callista Roy Adaptation Model. This mode is defined as the combination of beliefs and feelings a person has about himself or herself at a given point in time, integrated by internal perceptions and the perceptions of others [21]. The aim of the present work was to implement directed imagination as therapy for subjects with leprosy in an effort to achieve the following: strengthen their feeling of self-worth, motivate them, and improve their sensations and attitudes toward themselves, despite the social stigma caused by the disease.

## Materials and Methods

### Design

A quantitative study with a pre-experimental (pre-test and post-test), prospective, and longitudinal design was conducted on subjects with leprosy in October 2012 [22].

### Sample

The study population consisted of 40 persons presenting with leprosy, men and women between the ages of 40 and 60 years, with a mean age of  $53.5 \pm 6.9$  years, all belonging to the civil organization, "Amigos de Betania Luis Variara I.A.P", located in the city of Colima, capital of the Mexican State of Colima. The participants were selected using the simple random sampling method and the mean estimation formula for finite populations, obtaining a final sample of 24 persons [23].

### Selection criteria

Persons diagnosed with leprosy that wished to voluntarily participate, that were supported in their decision by their relatives, and that belonged to the civil organization "Amigos de Betania Luis Variara I.A.P" were included in the study.

### Variables

The dependent variable was the adaptation level of the self-concept mode in its 3 classifications: integrated, compensatory, and compromised (See instrument description). Ordinal scoring was used to measure the levels.

The directed imagination technique was the independent variable applied to the study group. Age, sex, educational level, marital status, occupation, length of time with diagnosis, and treatment duration were the intervening descriptive variables.

### Instrument Description

The data were collected using the "Viveros 03" instrument for persons with chronic diseases. This instrument has a Cronbach's alpha reliability coefficient of 0.8581. It is made up of 57 items that evaluate the dimensions of self-concept (self-esteem, body image, body sensation, the conscious self, the ideal self, and the moral self). The following numerical quantities were used to grade the adaptation level of the self-concept mode: from 57 to 133 points, compromised adaptation level; from 134 to 209, compensatory adaptation level; and from 210 to 285, integrated adaptation level [24].

It should be mentioned that the adaptation level according to the Roy model is defined as "the vital process condition" facilitated by two mechanisms: the regulatory subsystem (activated through the responses generated by the neurochemical system when there is a stimulus and its action on the effector organs; the entranceways are chemical in nature and are transmitted through the circulatory and nervous systems) and the cognitive subsystem (based on the complex activities that the central nervous system develops for interpreting and confronting the stimuli in relation to the human capacity to think, feel, and act). The adaptation levels referred to in this study are based on this definition. A compromised adaptation level means that the subjects have inadequate confrontation mechanism responses, resulting in a problem of adaptation; the compensatory adaptation level corresponds to the activation of the regulatory and cognitive mechanisms that, like a challenge from the integrated processes, look for adaptive responses in an effort to re-establish the system's organization. Finally, the integrated adaptation level is reached when the structures and functions of the vital processes work as a whole to satisfy human necessities [25].

The present research was approved by the Research and Ethics Committee of the Health Sciences and Engineering Division of the Universidad de Guanajuato, register CIDCSIC-1071207.

### Procedure

The project was presented to the proper authorities of the abovementioned institute and the prospective participants were directly invited to take part in the study. Those that accepted signed statements of informed consent and it was specified that their participation would be voluntary and that the information gathered would be managed confidentially, in accordance with the guidelines of the Declaration of Helsinki and the Mexican General Health Law on Human Research Subjects [26, 27].

### Pre-test phase

The initial data were collected at home visits, applying the "Viveros 03" survey to every study subject in order to identify the self-concept level. The instrument was applied exclusively by the head researcher and 3 advanced nursing students that had been previously instructed in its application; thus different criteria were avoided and the information was blinded. In addition, the data pertaining to the intervening variables described above were collected.

### Test phase

Two weeks after the pre-test phase, the directed imagination procedure was implemented. It consisted of 4 two-hour sessions per week, during which the patient was supposed to be relaxed and in a comfortable position, with eyes closed. The study subjects practiced the procedure through the symbolic repetition of an ideal model that they were to imagine at the instructor's suggestion. The model was the adoption of a desirable form of behavior when confronted with situations of rejection within the subject's social nucleus. The subject confirmed being able to picture the scene in his or her mind by verbally expressing what was being imagined. At the end of the session, in a group setting, each participant was asked to share his or her experience, receiving feedback from the instructor and fellow participants.

### Post-test phase

One week after the procedure, the evaluation instrument (“Viveros 03”) was applied again to analyze whether there had been changes in the level of self-concept that had initially been reported.

### Data analysis

The SPSS version 19.0 statistics package was used for the data analysis. The intervening variables were managed with descriptive statistics (frequencies, means, and percentages). The effectiveness of the applied technique was evaluated through the results of the pre-test and post-test, using the Wilcoxon signed-rank test with a 95% confidence interval (CI). The chi-square test was employed for the comparison of the sexes in the two phases of the procedure. Differences were considered to be statistically significant with a  $p \leq 0.05$  in the 2 statistical tests.

### Results

#### Participant characteristics

Twenty-four persons (18 women and 6 men) were studied. The mean age was  $53.5 \pm 6.9$  years. The most frequent level of education was primary school (58.3%) and the most frequent marital status was that of married (41.7%). The occupation with the highest percentage was that of housewife (54.2%). The mean length of time of diagnosis at the start of the procedure was  $39.7 \pm 11.9$  months and the mean treatment duration was  $12.7 \pm 5.1$  months.

#### Adaptation level of the self-concept mode

Table I shows the points obtained by all the study subjects (n=24) during the evaluation of the self-concept mode in the phases before and after the directed imagination procedure. Two main adaptation levels of the self-concept mode were identified in the pre-test and the post-test phases of the study: integrated adaptation (score of 210 to 285) and compensatory adaptation (score of 134 to 209). In the pre-test phase, 91.7% of the total study subjects (n=22) were situated at the integrated adaptation level and 8.3% (n=2) of the total were at the compensatory level. In the post-test phase, there was an increase of 4.1% (n=1) at the integrated adaptation level and a decrease in the same proportion at the compensatory adaptation level (Table 1).

Participant No.	Self-concept Mode	
	Pre-test	Post-test
1	207*	210
2	221	221
3	223	233
4	218	221
5	213	215
6	213	221
7	246	250
8	247	247
9	164*	180*

10	215	221
11	245	246
12	233	246
13	213	233
14	233	245
15	218	221
16	218	230
17	228	233
18	214	210
19	255	260
20	216	221
21	255	233
22	255	260
23	215	210
24	226	226
* Subjects at the Compensatory Adaptation Level (score of 134 to 209)		

**Table 1:** The self-concept mode adaptation level score for all study subjects

In relation to sex, in the pre-test phase, all the men participating in the study (n=6) were at the integrated adaptation level and only 2 women of the total of 18 were at the compensatory level. When the post-test phase was carried out, the men remained at the same adaptation level and 17 of the women were at the integrated adaptation level. Only one woman remained at the compensatory level (Table 2).

Pre-test			
	Integrated	Compensatory	P*
Women	16	2	0.39
Men	6	0	
Post-test			
Women	17	1	0.55
Men	6	0	
* Calculated with the chi-square test			

**Table 2:** Adaptation level based on sex

The Wilcoxon signed-rank test was used to compare the medians of the pre-test and post-test results for the total population and its result was statistically significant ( $p = 0.007$ , Table 3).

Variable	Median*	P**
Self-concept (Pre-test)	219.5	0.007
Self-concept (Post-test)	228	

\* Calculated with descriptive statistics. \*\*Calculated with the Wilcoxon signed-rank test.

**Table 3:** Effectiveness of directed imagination on the self-concept mode in the total study population

## Discussion

The demographic characteristics of a population subject to a study should always be taken into consideration, because they can be determining factors in the final results. We agree with Tsutsumi (2007), who reported that the low level of education in patients with leprosy was associated with an adverse quality of life and compromised mental health. The differences attributed to sex are apparent when dealing with cognitive functions. It is well known, for example, that self-concept is not equal between the sexes; there is evidence that self-concept, understood as the congruence between the concept of the physical self and the social self that a person has, can be stronger in men, and can vary in the absence of a given procedure [28].

Our results support the findings of Meneses (1987) in the sense that the men were situated at a higher self-concept level (integrated) than the women, before and after the applied technique; and such a self-concept level in men has important neurophysiologic bases. It has been demonstrated that non-adaptive confrontation, pessimism, dependency, low self-esteem, and victimization are psychological qualities that are more common in women and they facilitate having a lower self-concept level than men [28,29].

The directed imagination technique used in the present study has its origin in the simulation modeling technique first proposed by Cautela [1] and then taken up again by different research groups for the development of assertive responses and favorable conduct when facing situations of physical and emotional stress, such as alcoholism and obsessive-compulsive behavior [3], child integration in school activities and phobias caused by odontological treatments [5,4], hot flashes in postmenopausal women [10], the fear of falling in older adults [9], the distress prior to childbirth in primiparas [8], and the anxiety during dermatologic procedures [30]. Favorable results were reported in these studies.

Similar results were identified in our study, given that the technique employed favored the learning of new forms of conduct based on imagination as a process used by the brain to acquire knowledge that undoubtedly plays an important role in the psychic homeostasis [6].

In this sense, imagination is the result of the neuronal circuits involving areas of the brain such as the premotor region and the posterior parietal regions that are necessary for generating new mental images of a person's self-concept that are related to an experience that has never actually been experienced by that person; it is the result of his or her perceptual interpretation. This could be associated with consciousness of the self, which in turn would facilitate a change in that person's conduct [31,32], consequently promoting an effective confrontation when exposed to feelings such as pain [32,33], disgust, or discomfort [34,35].

## Conclusions

Maintaining health and providing healthcare require the participation of a multidisciplinary group in addition to the nursing personnel. Patients presenting with leprosy suffer with psychological symptoms that can be as incapacitating as the physical symptoms of the disease, and the nursing personnel rarely has the training to deal with this aspect of the patient's condition. Based on the abovementioned, our work included the necessary active participation of the psychology professional, whose expertise in the evaluation and management of the responses in this context contributed to the patient follow-up and to a more integrated care management. This resulted in the benefits of a better state of well-being and specifically of improved self-concept for the patient, which was corroborated by the nurses participating in the present study.

The results of our procedure - specifically in patients presenting with leprosy - suggest that the implementation of techniques with a cognitive-behavioral focus, such as the directed imagination technique, could contribute to improving the mental health and, in turn, the quality of life of these persons. This is in accordance with the postulates of the Roy Adaptation Model that suggest that individuals are capable of dealing with adverse focal stimuli (in our study, social stigma) through the activation of confronting mechanisms (directed imagination) for generating an effective adaptive response in the self-concept mode.

This study combined the Roy Adaptation Model with the scientific method and developed and carried out a procedure aimed at improving the self-concept level of the person presenting with leprosy. More studies providing scientific evidence that supports the nursing care given to patients with this pathology need to be carried out.

## Study limitations

Two important aspects of the present study were regarded as important limitations. The first was the type of instrument used for measuring the study variable and the second was the small sample size.

Even so, we feel that the use of surveys in studies similar to ours is acceptable if they have been validated in relation to criteria and content and utilized in populations with like characteristics. The frame of reference for the survey applied in the present study was the use of the Callista Roy Adaptation Model. Furthermore, after an extensive online search, no other instruments were found for studying the self-concept of patients with leprosy that were as appropriate as the Roy model.

The sample size of our study was small for two main reasons. First, the number of patients presenting with leprosy in the State of Colima is not high. And second, the effect of the stigma of the disease contributed to significantly reducing the participation of those patients in our study.

We believe that studies such as ours, conducted in countries with a socioeconomic development resembling that of Mexico, can serve as input and background for other intervention studies on vulnerable groups that encompass behavioral and/or emotional themes attributable to the disease, and in this way improve the treatment and care of these patients.

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