

# The liver transplant patient: characterization of the therapeutic regimen management style

A pessoa submetida a transplante de fígado: caracterização do estilo de gestão do regime terapêutico

El paciente sometido a un trasplante de hígado: caracterización del estilo de gestión del régimen terapéutico

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## Abstract

**Background:** The characterization of the therapeutic regimen management style may help predict how individuals will manage their therapeutic regimens after liver transplantation.

**Objectives:** To describe liver transplant recipients' therapeutic regimen management style and identify its impact on success indicators.

**Methodology:** Quantitative, descriptive, and exploratory study using the instrument for therapeutic regimen management style characterization.

**Results:** A style close to the responsible style (51.35) and the undefined style (47.4%) are the predominant therapeutic regimen management styles, with characteristics of the 4 theoretical styles. No statistically significant correlation was found between qualitative indicators of success, intensity of alteration in analytical values and therapeutic regimen management styles.

**Conclusion:** The predominant style in this sample is the responsible style. Therapeutic regimen management styles have a weak impact on the alteration of intensity in analytical values and qualitative indicators. The identification of each style allows anticipating difficulties and implementing nursing interventions targeted at individual characteristics.

**Keywords:** liver transplantation; self care; nursing

## Resumo

**Enquadramento:** A caracterização do estilo de gestão do regime terapêutico pode ajudar a prever a forma como as pessoas irão gerir os seus regimes terapêuticos, após transplante de fígado.

**Objetivos:** Caracterizar o estilo de gestão do regime terapêutico das pessoas submetidas a transplante de fígado e compreender o seu impacto nos indicadores de sucesso.

**Metodologia:** Estudo quantitativo, descritivo e exploratório, utilizando o instrumento de caracterização do estilo de gestão do regime terapêutico.

**Resultados:** O estilo de gestão do regime terapêutico distribui-se predominantemente num estilo próximo do responsável (51,3%), e do tipo indefinido (47,4%), apresentando características dos 4 estilos teóricos. Os indicadores qualitativos do sucesso e da intensidade de alteração dos valores analíticos não se correlacionam significativamente com os estilos de gestão do regime terapêutico.

**Conclusão:** O estilo predominante da amostra é o responsável. Há um fraco impacto dos estilos de gestão do regime terapêutico na intensidade de alteração dos valores analíticos e indicadores qualitativos. A descrição do estilo permite antecipar dificuldades e a implementação de terapêuticas de enfermagem dirigidas às características individuais.

**Palavras-chave:** transplante de fígado; autocuidado; enfermagem

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## Resumen

**Marco contextual:** La caracterización del estilo de gestión del régimen terapéutico puede ayudar a predecir la forma en que las personas gestionarán sus regímenes terapéuticos después de un trasplante de hígado.

**Objetivos:** Caracterizar el estilo de gestión del régimen terapéutico de las personas sometidas a trasplante de hígado y comprender su impacto en los indicadores de éxito.

**Metodología:** Estudio cuantitativo, descriptivo y exploratorio, en el que se utilizó el instrumento de caracterización del estilo de gestión del régimen terapéutico.

**Resultados:** El estilo de gestión del régimen terapéutico se distribuye predominantemente en un estilo cercano al responsable (51,3 %) y del tipo indefinido (47,4 %), y presenta características de los 4 estilos teóricos. Los indicadores cualitativos del éxito y la intensidad de alteración de los valores analíticos no se correlacionan significativamente con los estilos de gestión del régimen terapéutico.

**Conclusión:** El estilo predominante de la muestra es el responsable. Existe un débil impacto de los estilos de gestión del régimen terapéutico en la intensidad de alteración de los valores analíticos y los indicadores cualitativos. La descripción del estilo permite anticipar dificultades e implementar terapias de enfermería dirigidas a las características individuales.

**Palabras clave:** transplante de hígado; autocuidado; enfermería

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## Introduction

Liver transplantation is the last resort for treating end-stage liver disease. Although it is a high-risk surgical procedure, advances in surgical techniques and immunosuppressive therapy have resulted in significant improvements in post-transplantation survival (Yang, Shan, & Morris, 2014). Despite the scientific and technological advances, the success of transplantation depends very much on the patients' behavior since they are asked to reformulate and integrate new aspects into their self-care routines with a view to ensuring organ viability and maintaining or improving their quality of life. As a result, patients need help to make the best choices, and guidance from the pre-transplantation to the post-transplantation phase so that they can adopt correct behaviors to guarantee their quality of life (Baldoni et al., 2008). In fact, "people with chronic liver failure need nursing interventions to support the required lifestyle changes, so as to prevent and control disease progress." (Mendes et al., 2013, p. 2).

This study aims to characterize liver transplant recipients' therapeutic regimen management style, assess its clinical utility in terms of transplantation, and understand its impact on the clinical variables, taking into account the potential implementation of more appropriate nursing therapies, adjusted to the personal characteristics and as a positive influence on self-care behaviors. "Nurses are the best-placed professionals to play the role of facilitators in the transition process due to their proximity and knowledge of the patients' reality and needs" (Mota, Rodrigues, & Pereira, 2011, p. 25).

## Background

In the area of transplantation, the concept of self-care is of utmost importance, since patients need to demonstrate an ability to meet the new self-care demands in the pre-transplantation phase due to its strong impact

on the success of the surgical procedure and their quality of life. Self-care is influenced by patients' life experiences, values, beliefs, and attitudes, as well as their social and cultural experiences (Backman & Hentinen, 1999, 2001). Patients' attitude and willingness influence their self-care (Backman & Hentinen, 1999, 2001), which can affect both the disease and the therapeutic regimen management after liver transplantation (Mota, 2011). The self-care profile is a key aspect of this approach, because it may affect individuals' behaviors and their capacity to promote health, prevent disease, maintain health, and cope with illness (World Health Organization, 2009).

Self-care is associated with other concepts such as adherence and self-management. The concept of *adherence/non-adherence* reflects the degree of compliance with therapeutic guidelines, and "is used as an indicator of success in self-management or in how each client incorporates the regimen into their daily lives" (Mota, 2011, p. 33). It has a strong influence on morbidity and mortality after liver transplantation and on health-related costs (Jindel, Joseph, Morris, Santella, & Baines, 2003; Telles-Correia, Mega, Barbosa, Barroso, & Monteiro, 2008). Therapeutic regimen management involves knowledge and beliefs, self-regulation skills, social skills and support for individuals to be able to manage their chronic illness or adopt healthy behaviors. Thus, adherence to the therapeutic regimen is an outcome indicator of therapeutic regimen management.

The identification of the patients' personal conditions, attitude towards life/illness, and personal characteristics makes it possible to characterize how each person responds to the challenge of management by analyzing his/her attitudes and behaviors in four patterns, i.e. management styles: responsible, independent, formally guided, and negligent (Bastos, 2015).

Bastos (2015) argues that patients with a negligent style do not adhere to medication, miss appointments, and do not make the necessary diagnostic exams requested by

professionals. In addition, they believe that their health problems will never improve (Zeleznik, 2007). Individuals with a formally guided style demonstrate consistency between health professionals' guidance and their behavior (Bastos, 2015); however, they have an attitude of passivity towards health-related behaviors (Zeleznik, 2007). Individuals with an independent therapeutic regimen management style have an internal locus of control towards their health and disease (Bastos, 2015); they are usually determined in life, and gradually integrate the professionals' self-care recommendations into their lives (Backman & Hentinen, 1999). Individuals with a responsible therapeutic regimen management style are more proactive than those with an independent style, despite having similar personal characteristics (Bastos, 2015). Thus, their attitude is characterized by a strong sense of responsibility regarding self-care (Backman & Hentinen, 1999).

The explanatory theory on the therapeutic regimen management style (Bastos, 2015) is based on two key dimensions of therapeutic regimen management: Flexibility and Control (Bastos, 2015). Both dimensions contribute to the characterization of the therapeutic regimen management style and vary between opposite semantic fields: flexibility/rigidity, control/temptation. These dimensions are based on seven variables: internal locus of control, decision-making, self-determination, attitude towards the disease, attitude towards the therapeutic regimen, self-efficacy, and interaction with professionals.

According to the biomedical model, the monitoring of the success of transplantation is strongly focused on graft survival, with monitoring of immunosuppression and biochemistry (Bucuvalas et al., 2008). Changes in laboratory parameters translate into a set of clinical signs and symptoms (ascites, itching, edema, hemorrhage, drowsiness, memory changes, nausea, vomiting...), which are called qualitative success indicators.

## Research questions

What is the impact of the therapeutic regimen management style on the intensity of alteration in analytical values and the qualitative indicators of success?

## Methodology

This is a quantitative, cross-sectional, descriptive, and exploratory study, in which the participants' perspective is a key aspect. It was developed at the liver transplantation center in Porto.

Data were collected using a form for characterization of the therapeutic regimen management style designed by a group of experts of the Nursing School of Porto (Bastos, Brito, & Pereira, 2014). The instrument for characterization of the therapeutic regimen management style is based on the explanatory theory on the therapeutic regimen management style (Bastos, 2015).

The form is undergoing a validation process which will also benefit from this study. The Cronbach's alpha coefficient of the instrument is 0.899. It is divided into three parts: the first two parts are composed of self-report items, in which the first part aims to identify personality traits and attitudes towards the disease and the therapeutic regimen the second one to understand the perceived behavior towards the therapeutic regimen; and the third part is designed to identify nurses' perception of how patients manage their therapeutic regimen with a view to characterizing their therapeutic regimen management style. The variables are rated on a Likert scale ranged between semantic fields. The first part of the instrument *Questionário dos Traços Identitários e das Atitudes face à Doença e ao Regime Terapêutico* (Questionnaire on Personality Traits and Attitudes Towards the Disease and the Therapeutic Regimen) uses a semantic agreement scale that ranged from 0 to 4 (*Totally disagree - Totally agree*). The second and third parts of the instrument use a frequency scale on a given behavior, rang-

ing from 0 to 4 (*Never - Always*). The instrument also includes variables for socio-demographic (age, marital status, years of education, and professional situation) and clinical (time elapsed since transplantation, length of hospital stay, and cause of liver disease) characterization, as well as data widely recognized by the scientific community as general measures of transplantation success (biochemical data on liver function collected from clinical records and a set of signs/symptoms caused by changes in liver function).

A nonprobability convenience sample was used. A total of 150 of the 1095 patients of the transplantation center in Porto (which began its activity in 1995) participated in the study. Data were collected between January and July 2014. All participants who agreed to participate and who, during the data collection period, went to the hospital for consultations or were hospitalized in the transplantation center in Porto.

Statistical analysis was carried out using the Statistical Package for the Social Sciences (SPSS), version 22.0, and followed the same logics of the study of Meireles (2014), with the same object of study. Thus, based on the set of questions that characterize each therapeutic regimen management style and its dimensions, the mean score of the styles and dimensions was calculated for each case. In this way, each participant obtained a new score (between 0 and 4).

Based on the biochemical data of the liver function, the *intensity of alteration in analytical values* was calculated by reencoding the original variables into new variables (intermediate). A score of 0 was assigned when the parameter was below normal, a score of 1 when it was within the normal range recommended by the transplantation center in Porto, and a score of 2 when it was above the normal range for each analytical parameter and each case. The *intensity of alteration in analytical values* is equal to the mean when ignoring the null values that comprise the new variable.

Based on the perceptions of each case on the set of signs and symptoms indicating changes in liver function (itching, ascites, edema...), the *intensity of the qualitative indicators of success* was calculated. Each original variable (itching, ascites...) was rated on an ordinal frequency scale ranging from 1 (*never*) to 5 (*always*). The *intensity of the qualitative indicators of success* was calculated using the mean and ignoring the null values of the items that compose it.

The scores for each therapeutic regimen management style were correlated with the attribute and clinical variables using Pearson's correlation coefficient.

The participation in the study was voluntary, anonymity was ensured, and participants were given the opportunity to withdraw from the study without any prejudice. The study was approved by the Board of Directors of the Porto Hospital Center.

## Results

With regard to participants' sociodemographic characteristics (Table 1), most of them are male (69.3%) with a mean age of 51 ( $\pm 11.59$ ) years, ranging between 19 and 74 years. Most participants (76.7%) were married or cohabiting. As to the years of education, 77.3% of them attended only up to 5 years of school. With regard to the professional situation, 66.7% of the participants were not professionally active.

Study participants had received the transplant, on average, 4 years ( $\pm 4.54$ ) before, ranging between less than 1 year and 18 years since transplantation. In this study, 50% of participants had received the transplant 3 years before. The liver disease that most often led to transplantation was alcoholic liver cirrhosis (36%). The mean length of hospital stay was 30 ( $\pm 23.57$ ) days for transplantation, ranging between 10 and 156 days. Fifty percent of the participants remained hospitalized for transplantation during 22 days.

Table 1  
*Sociodemographic and clinical characterization of participants*

Variables	N (%)
Age (years)	51*
Gender	
Male	104 (69.3)
Female	46 (30.7)
Marital status	
Married/Cohabiting	115 (76.7)
Single	18 (12.0)
Divorced	13 (8.7)
Widowed	4 (2.7)
Years of education	
4 years	74 (49.3)
5 years	42 (28.0)
12 years	25 (16.7)
15 years	2 (1.3)
17 years	7 (4.7)
Professional status	
Employed	50 (33.3)
Unemployed	16 (10.7)
Retired	84 (56)
Time elapsed since transplantation (years)	4*
Hospital length-of-stay (days)	30*
Cause for liver disease	
Alcohol	54 (36)
Familial amyloid polyneuropathy	26 (17.3)
Hepatitis	23 (15.3)
Mixed (alcohol and hepatitis or hepatitis and carcinoma)	22 (14.7)
Carcinoma	6 (4)
Others	19 (12.7)

\*Variable described using the mean

The most common therapeutic regimen management style was the *responsible* type, although there was a large percentage of participants in the *undefined* group. There was a total of 77 participants with a predominant-

ly responsible therapeutic regimen management style, of whom 22 had a completely responsible style. There were also two participants with a predominantly negligent style (Table 2).

Table 2

*Distribution of participants according to the therapeutic regimen management style*

Therapeutic Regimen Management Style	N (%)
Predominantly responsible	77 (51.3)
Predominantly negligent	2 (1.3)
Undefined	71 (47.4)
Total	150 (100)

Pearson's correlation coefficient ( $r$ ) revealed a correlation between the therapeutic regimen management styles and the sociodemographic variables and a single statistically significant correlation with age and years of education.

A significant negative correlation was found between the responsible score and age,  $r = -0,265$ ,  $p < 0.001$ . A significant positive correlation was found between the formally guided score and age,  $r = 0.236$ ,  $p = 0.004$ . Thus, participants showed fewer responsibility characteristics as they got older, while the opposite was observed in relation to the formally guided style.

In terms of education, a significant positive weak correlation was found between education and the responsible score ( $r = 0.292$ ,  $p < 0.001$ ), and a negative correlation with the formally guided score ( $r = -0,451$ ,  $p < 0.001$ ) and negligent score ( $r = -0,172$ ,  $p < 0.035$ ). Patients with more years of education were more responsible, less formally guided, and less negligent.

The association between the therapeutic regimen management styles and both core dimensions (control and flexibility) showed that patients with higher scores in

the responsible style had more control ( $r = 0.759$ ,  $p < 0.001$ ) and flexibility ( $r = 0.789$ ,  $p < 0.001$ ) in each situation. The higher the score in the formally guided style, the lower is the control ( $r = -0,749$ ,  $p < 0.001$ ) and the flexibility ( $r = -0,349$ ,  $p < 0.001$ ). In addition, the higher the negligent style score, the lower is the control ( $r = -0,584$ ,  $p < 0.001$ ) and the flexibility ( $r = -0,757$ ,  $p < 0.001$ ), that is, the higher is the temptation and the rigidity. No statistically significant correlation was found with the independent style.

As we can see in Table 3, a significant positive correlation was found between the responsible style score and decision-making skills, self-determination, perceived self-efficacy, attitude towards the disease and the regimen, and interaction with health professionals. The higher the score in the formally guided style, the lower is the score in the locus of internal control, decision-making skills, perceived self-efficacy, attitude towards the disease, and interaction with health professionals. The independent style was significantly and positively correlated with the decision-making skills. The negligent style was significantly and negatively correlated with all seven variables.

Table 3

Correlation matrix between therapeutic regimen management styles and the seven variables

		Internal locus of control	Decision-making	Self-determination	Self-efficacy	Attitude towards the disease	Attitude towards the regime	Interaction with health professionals
Responsible score	<i>r</i>	0.157	0.742 <sup>†</sup>	0.782 <sup>†</sup>	0.286 <sup>†</sup>	0.609 <sup>†</sup>	0.738 <sup>†</sup>	0.347 <sup>†</sup>
Formally Guided score	<i>r</i>	-0.817 <sup>†</sup>	-0.575 <sup>†</sup>	-0.115	-0.169 <sup>*</sup>	-0.517 <sup>†</sup>	-0.043	-0.442 <sup>†</sup>
Independent score	<i>r</i>	0.086	0.177 <sup>*</sup>	0.002	-0.010	-0.012	-0.075	-0.082
Negligent score	<i>r</i>	-0.289 <sup>†</sup>	-0.340 <sup>†</sup>	-0.442 <sup>†</sup>	-0.691 <sup>†</sup>	-0.794 <sup>†</sup>	-0.326 <sup>†</sup>	-0.377 <sup>†</sup>

\*Significant correlation for  $p = 0.05$ . † Significant correlation for  $p < 0.001$ .

Overall, liver transplant recipients' therapeutic regimen management style varies between the formally guided, responsible, and independent styles (Figure 1). Participants showed a higher mean score in the

responsible style (3.17), followed by the independent style with mean scores of 2.01, the formally guided style with mean scores of 1.99, and the negligent style with lower mean scores (1.46).

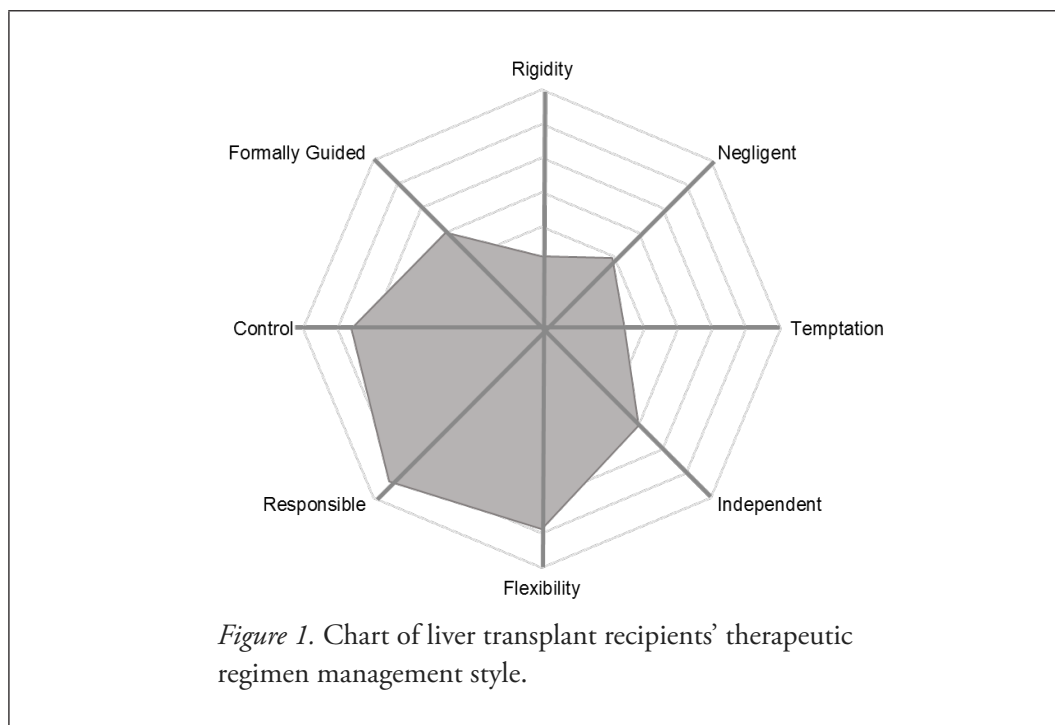


Figure 1. Chart of liver transplant recipients' therapeutic regimen management style.

With regard to the key properties of the therapeutic regimen management, participants showed higher mean scores in flexibility (2.94) and control (2.79). The responsible therapeutic regimen management style varies between control and flexibility, marked by the patient's knowledge and skills (Bastos, 2015). In general, patients with a formally guided style manage their therapeutic regimen between control and rigidity, with a greater tendency for control. These patients alternate between the locus of external and internal control (Bastos, 2015). These patients' locus of external control is characterized by demand/need for (family/social) support.

The independent therapeutic regimen management style is characterized by being diametrically opposed to the formally guided style, oscillating between temptation and flexibility. These patients are highly in control of the situations (locus of internal control) but have a constant sense of temptation (Bastos, 2015). In this way, their level of compliance with the therapeutic regimen can oscillate from highly non-compliant (maximum of temptation) to some adjustments that the patient considers as relevant based on the *I know what is best* premise, but drawing closer to the responsible style.

The negligent therapeutic regimen management style emerges in a diametrically opposite quadrant to the responsible style, oscillating between rigidity and temptation. Patients find it very difficult to get involved in situations, do not seek information, do not want to listen to health professionals' guidelines; thus, they are not flexible and do not monitor their health condition or outcomes (Bastos, 2015).

The intensity of alteration in analytical values of 1.26 (0.50 - 1.75) means that the participants' condition is analytically good. With regard to the intensity of the qualitative indicators, the study participants have mean values of 1.45 (1.00 - 2.62), which indicates a low perception of these indicators.

The analysis of the correlation between the intensity of alteration of the analytical values and the scores of the therapeutic regimen management styles showed a single significant positive correlation with the formally guided style ( $r = 0.162, p = 0.047$ ).

The analysis of the correlation between the intensity of the qualitative indicators and the scores of the therapeutic regimen management styles showed that the higher the score in the negligent style, the higher is the perceived intensity of the qualitative indicators ( $r = 0.254, p = 0.003$ ), and also that the higher the score in the formally guided style, the higher the perceived intensity of the qualitative indicators ( $r = 0.172, p = 0.044$ ).

## Discussion

The high number of undefined styles may lead to questions about the clinical utility of the instrument used; however, the purpose of the instrument is to allow the identification of the patients' difficulties, rather than *putting a label* on them, so as to guide the interventions towards a predictive intentionality. The therapeutic regimen management style is distributed mainly between the predominantly responsible and the undefined types, which translates into a "mix of characteristics from the different theoretical profiles" (Sequeira, 2011, p. 8). However, a slight predominance of individuals with a style close to the responsible style was found in this sample, which may relate to the fact that patients in the pre-transplantation phase must demonstrate a *predictive* attitude of greater responsibility towards life, health, and illness to be included in the list of transplant recipients. If patients do not show such responsibility skills, they are at risk for being lost to follow-up, not being listed for transplant and not receiving a transplant (Kazley, Hund, Simpson, Chavin, & Baliga, 2015). On the other hand, as mentioned above, the main cause for liver disease derives from alcohol consumption; excessive consumption or *dependencies* are closely related to a negligent style. However, we recognize that patients' perception of disease severity and awareness of the consequences of continued negligence towards the health condition precludes treatment - transplantation, posing a major existential dilemma. Transplant recipients should be frequently confronted with the opposition between their previous behavior pattern - style - and the necessary pattern to remain healthy, which may explain

the large percentage of patients with mixed characteristics.

The significant negative correlation observed between the responsible style score and age may be related to the need, at a more advanced age, for validation of attitudes, resulting in a more formally guided style. In addition, the variable of years of education can mediate this result to the extent that it tends to reduce with age. More educated people tend to be more responsible and less formally guided or negligent, probably due to the fact that they show greater decision-making skills. Higher levels of education can lead to higher health literacy levels.

Health literacy plays a crucial role in the transplantation process (Kazley et al., 2015). Its indicators are health knowledge, health-seeking behaviors, and the decision-making process (Omachi, Sarkar, Yelin, Blanc, & Katz, 2013). Given the proximity between health literacy indicators and the criteria characterizing the responsible therapeutic regimen management style, individuals with a responsible style tend to have higher health literacy levels. People with a negligent therapeutic regimen management style, due to their characteristics, show little knowledge about their health, no health-seeking behaviors, and difficulty in decision-making.

The study participants are generally characterized by high levels of control and, therefore, by an attitude of control over their therapeutic regimen management and well-being, not giving rise to the attitude of falling into temptation. In addition, there is a predominance of flexibility due to adjustments in the therapeutic regimen management on their own initiative or following health professionals' suggestion.

The positive strong correlation between the core properties of therapeutic regimen management (control and flexibility) and the responsible style confirms the explanatory theory on the therapeutic regimen management style (Bastos, 2015), because "the responsible style is characterized by a major control over the situation, which allows a greater flexibility in the therapeutic regimen based on the patient's knowledge and skills (empowerment)" (Bastos, 2015, p. 139). Due to their level of involvement in their health/disease situation,

these individuals require more information about their medical condition. In addition, in the interaction with health professionals, they give priority to cooperation, mainly positive interaction. Based on these premises, these patients have strong decision-making skills.

Individuals with a formally guided therapeutic regimen management style have less flexibility in managing their therapeutic regimen since "this style does not allow for flexibility in the therapeutic regimen; on the contrary, it is a restrictive regimen that is based, above all, on prohibitive behaviors" (Bastos, 2015, p. 299). Their poor decision-making skills, low perceived self-efficacy, and poor locus of external control create a major need for social, family, or professional support. Unlike what is described in the explanatory theory on therapeutic regimen management styles (Bastos, 2015) regarding a good and trustful interaction with health professionals, they believe that there is poor interaction with health professionals in this context. This result may relate to the fact that the family is the major source of support for these patients or to the fact that they are more demanding in this relationship.

The higher the score in the negligent therapeutic regimen management style, the lower is the control score, which reveals the presence of a locus of external control, which is why health/disease events result from factors outside their control. These patients also have a significant negative correlation with flexibility and, therefore, with a poor capacity for adaptation to new situations. "The interaction with health professionals is of the search/escape type" (Bastos, 2015, p. 297), giving rise to the ambiguity of wanting and not wanting to be accompanied, which justifies the significant negative correlation with the negligent style. They have a low perceived self-efficacy and poor decision-making skills.

The identification of the therapeutic regimen management styles suggests that liver transplant recipients have different characteristics and specific intervention needs, which, however, do not affect significantly the intensity of alteration in the analytical values and qualitative indicators.

Individuals with a predominantly formally guided therapeutic regimen management

style have a higher intensity of alteration in analytical values and a higher perception of the alteration in qualitative indicators, which may indicate the need to increase the intensity of follow-up for these patients.

It was also clear that individuals who have a predominantly negligent style have a higher perception of the signs and symptoms of the disease, which may be associated with a more negative perspective of their health condition. Although these patients only represent a small percentage of liver transplant recipients, they may represent a significant percentage of cases of unsuccessful transplantation. For this reason, they should be included in patient case management programs aimed at improving patients' quality of life and reducing health-related costs. On the other hand, it may allow patients who a priori would be excluded to be integrated into the transplantation list, as long as this type of monitoring is made available.

The limitations of the study related mainly to the sample size and the use of a non-random sampling technique, i.e. the representativeness of the universe of liver transplant recipients, and to the use of an instrument that is currently being validated.

## Conclusion

Liver transplant recipients' therapeutic regimen management style is predominantly responsible. Most patients show good control and flexibility in different situations, decision-making skills, self-determination, and self-efficacy. They have a good attitude towards the disease and the regimen, and a good interaction with health professionals. Individuals with a formally guided style are characterized by a locus of external control and poor decision-making skills, which does not allow them to be flexible and adapt to new situations, and a poor interaction with health professionals. These individuals are also characterized by a higher intensity of alteration in the analytical values and higher perception of the qualitative indicators of success. The sampled patients with an independent style are characterized by good decision-making skills. The negligent style is characterized by the re-

jection of all health professionals' guidelines and a higher perception of the qualitative indicators of success. The identification of the therapeutic regimen management styles by the health professionals will enable the implementation of nursing interventions that meet liver transplant recipients' real needs. In terms of future developments, it is important to increase the potential for clinical utility of the instrument for characterization of the therapeutic regimen management styles by enhancing knowledge that will allow a better adjustment of nursing interventions to the patients' personal characteristics. A follow-up program (patient case management) for individuals who are particularly vulnerable based on their therapeutic regimen management styles should be developed. It would be interesting to study whether individuals can change their less responsible styles and a more intense follow-up can change their style, thus becoming less vulnerable.

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