Quality of life of patients who undergone myocardial revascularization surgery

Qualidade de vida de pacientes submetidos à cirurgia de revascularização do miocárdio

La calidad de vida de los pacientes sometidos a cirugía de revascularización del miocardio

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ABSTRACT

Objective: to evaluate the quality of life of patients who underwent revascularization surgery. **Method:** a descriptive, cross-sectional study, with quantitative approach carried out with 75 patients. The questionnaire WHOQOL-Bref was used to evaluate the quality of life (QOL). **Results:** patients' QOL evaluation presented a moderate result, with need of improvement of all domains. Low income patients had the worst evaluation of QOL in the domain environment (p=0,021), and the ones from Recife/metropolitan area, in the domain social relationship (p=0,021). Smoker (p=0,047), diabetic (p=0,002) and alcohol consumption (p=0,035) patients presented the worst evaluation of the physical domain. Renal patients presented the worst evaluation of QOL in the physical (P=0,037), psychological (p=0,008), social relationship (p=0,006) domains and total score (p=0,009). **Conclusion:** the improvement of QOL depends on the individual's process of behavioral change and the participation of health professionals is essential to formulate strategies to approach these patients, especially concerning health education.
Descriptors: Quality of Life; Thoracic Surgery, Coronary Heart Disease; Chronic Disease; Nursing.

RESUMO

Objetivo: avaliar a qualidade de vida de pacientes submetidos à cirurgia de revascularização. **Método:** estudo descritivo, transversal, com abordagem quantitativa realizado com 75 pacientes. Foi utilizado o questionário WHOQOL-Bref para avaliação da qualidade de vida (QV). **Resultados:** Pacientes apresentaram avaliação da QV regular, com necessidade de melhora em todos os domínios. Pacientes de baixa renda tiveram pior avaliação da QV no domínio meio ambiente (p=0,021), e os procedentes de Recife/região metropolitana, no domínio relações sociais (p=0,021). Pacientes tabagistas (p=0,047), diabéticos (p=0,002) e etilistas (p=0,035) apresentaram pior avaliação da QV no domínio físico. Pacientes renais apresentaram pior avaliação da QV nos domínios físico (P=0,037), psicológico (p=0,008), relações sociais (p=0,006) e no escore total (p=0,009). **Conclusão:** a melhoria da QV depende de um processo de mudança de comportamento individual e a participação dos profissionais de saúde é essencial para elaborar estratégias de abordagem desses pacientes, principalmente no tocante à educação em saúde.
Descritores: Qualidade de Vida; Cirurgia Torácica; Doença das Coronárias; Doença Crônica; Enfermagem.

RESUMEN

Objetivo: evaluar la calidad de vida de los pacientes sometidos a cirugía de revascularización. **Método:** estudio descriptivo, transversal, con abordaje cuantitativo llevado a cabo con 75 pacientes. Se empleó el cuestionario WHOQOL-Bref para evaluar la calidad de vida (CV). **Resultados:** Los pacientes tuvieron CV regular, necesitando mejoras en todos los dominios. Los pacientes de baja renta presentaron peores índices de CV en el dominio medioambiental (p = 0,021), así como presentaron los provenientes de la ciudad de Recife y región en el dominio relaciones sociales (p = 0,021). Los pacientes fumadores (p = 0,047), diabéticos (p = 0,002) y de la clase alta (p = 0,035) tuvieron peores valores de CV en el dominio físico. Los pacientes con problemas renales presentaron peores índices de CV en los dominios físico (p = 0,037), psicológico (p = 0,008), relaciones sociales (p = 0,006) y en el puntaje total (p = 0,009). **Conclusión**: para mejorar la CV hay que cambiar la conducta individual, y es muy importante la participación de los profesionales de salud en la planificación de estrategias de abordaje a estos pacientes, en especial en la educación en salud.
Descriptores: Calidad de Vida; Cirugía Torácica; Enfermedad Coronaria; Enfermedad Crónica; Enfermería.

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INTRODUCTION

Recent data from the World Health Organization (WHO) show that cardiovascular disease represent the main cause for mortality and disability in Brazil and in the world. In Brazil, Coronary Artery Disease (CAD) caused more than 100 thousand deaths in 2011[1].

Several risk factors are associated with CAD, and are significant in all populations, such as smoking, alcohol consumption, hypertension, hypercholesterolemia, obesity, sedentary lifestyle, and low intake of fruits and vegetables[2].

Among cardiovascular disease (CVD), CAD represents the most common cause of cardiac ischemia and may happen in different ways, from angina pectoris to acute myocardial infarction (AMI). As a form of treatment, myocardial vascularization surgery (MRV) is recommended for patients with unstable angina and for those with high levels of coronary artery occlusion. MRV aims for the improvement of quality of life (QOL) of patients, reduce angina symptoms, reestablish physical capacity, as well as increase survival – above all, of patients with higher cardiovascular risk[3].

The impact of QOL related to MRV has been relevant purpose for study, because, beyond evaluating therapeutic results, it produces hypothesis and thoughts that suggest the increase of focus on researches about QOL[4].

Interventions in CAD's risk factors, such as change of lifestyle, and surgical procedures may affect patients emotionally, physically and socially and their QOL as a whole. Recent studies on QOL have been carried out with patients with morbid conditions, aiming to verify the different therapeutic measures directed to the improvement of clinical conditions and patient's QOL[5].

The concept of QOL is polysemic and WHO, in 1995[6], defined it as "individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". Health-related quality of life (HRQOL) may be defined as the value attributed to life's duration when modified by perception of physical and psychological limitations, social functioning and opportunities influenced by disease, treatment and other disabilities[7].

The patient is the better source of information on their QOL, which is measured and defined according to the disease. Its improvement, from the perspective of health care, has been an expected result, both in care practices and public policies[8].

QOL is an important matter that concerns nursing professionals. This matter requires that these professional make a trustworthy evaluation that allow them to assess the impact of a cardiac surgical procedures on patient's life, as well as to provide with subsidy based on the individual's general perception of their own health. In view of this, the objective of this research is to evaluate QOL of patients who underwent MRV[9].

METHOD

Ethical Aspects

According to Resolution No. 466/2012[10], on research involving human subjects, this study was approved by the Research Ethics Committee of the University of Pernambuco (Universidade de Pernambuco), submitted to Plataforma Brasil.

Design, Place and Period of Study

This is a cross-sectional exploratory study with quantitative approach. The study was carried out in the clinic of cardiac surgery of Cardiac Emergency Room of Pernambuco Professor Luiz Tavares (Pronto-Socorro Cardiológico de Pernambuco Professor Luiz Tavares – Procape), a referral hospital in the north and northeast region for cardiology, where interface of public policies relevant in health and education takes place. Data was collected in the days scheduled for appointments at the clinic, through private interview from June to October 2015.

Population or sample and inclusion or exclusion criteria.

The sample consisted of all individuals that met criteria for inclusion. To delimit the sample, the equation of sample size was calculated. For that, error alpha level of 5% was used,

which corresponds to the difference between the value estimated in the research and the real value; confidence interval of 95%, which is the probability of real sampling error to be lower than the sampling error accepted in the research.

The sample was corrected by a finite population, with total of 75 patients. Standard deviation used was 20.35, as reference a recent publication was considered and evaluating, through the same instrument, QOL of patients after cardiac surgery.

The individuals that participated in the research met the following inclusion criteria: to be a patient of the clinic of Procape, to be 18 years old or older and patients who have undergone MRV surgery. Patients with neurological deficits or health conditions that would make data collection impracticable were excluded.

Protocol of study

Two instruments for data collection were used. The first was a semi-structured questionnaire with objective questions to characterize social, demographic, economical and clinical data.

The second instrument was *World Health Organization Quality of Life – Bref* (WHOQOL-Bref), completed individually and reading with the patient. This a questionnaire with objective questions about QOL in the physical, psychological, social relationship and environment domains. This questionnaire is the short version of WHO's QOL instrument, *World Health Organization Quality of Life – 100* (WHOQOL-100), translated into Portuguese, in Brazil, and into more than other 20 languages. It is a generic, short, easy management and understanding questionnaire, with 26 questions, culturally adapted to Brazilian population according to international methodology and accepted by multicentric study groups of WHO in Brazil.

The first and second questions are about QOL in general. The instrument also has other 24 facets (questions), which consist of the four domains evaluated. The answers are based on a Likert-type scale (1 to 5, the higher answer means better QOL). The scoring of facets and domains were calculated to a scale of 0 to 100, in which the closer to 100 the value is, the better is the QOL evaluation.

Results analysis and statistics

The variables were descriptively analyzed, they were processed and analyzed with the software IBM SPSS version 20.0. Test *t-Student* was used and adapted to $p < 0,05$.

RESULTS

With regard to sociodemographic data, age varied from 39 to 85 years old, average 64.96, from this total 73.3% were 60 years old or older; 41.3% are from Recife and 37.3% are from the metropolitan area of Recife. With regard to gender, there was no significant difference, 50.7% were female. Concerning ethnic groups, 42.7% are white, 48% mixed race and 9.3% black. The majority of participants is married (56%), have low education level (72%,), low income (62.7%) – up to one minimum wage. Regarding work, 89.3% are not currently working.

Table 1 – Participants description according to sociodemographic variables (N = 75), Recife, Pernambuco, Brazil, 2015

Variables	n	%
Origin		
Recife	31	41.3
Metropolitan area	28	37.3
Countryside	16	21.4
Age		
≥ 60 years old	55	73.3
Younger than 60 years old	20	26.7
Gender		
Male	37	49.3
Female	38	50.7
Ethnicity		
White	32	42.7
Mixed race	36	48
Black	7	9.3
Marital status		
Single	15	20
Married	42	56
Widow	11	14.7
Divorced	7	9.3
Schooling		
Until 9 years old	54	72
> 9 years old	21	28
Income		
Until 1 minimum wage	47	62.7
1-2 minimum wage	16	21.3
> 2 minimum wage	12	16
Occupation		
No work activity	67	89.3
Work activity	8	10.7

Note: *Monthly income based on current value (R$ 880,00) of minimum wage.

With regard to clinical aspects (Table 2), 100% have high blood pressure, 44% are diabetic, 12% present nephropathology, 98.7% claimed to be non-smokers, 94.7% claimed no alcohol consumption, 96% presented dyslipidemia and 73.3% are sedentary. Concerning medication, 72% take up to 6 medications daily.

Table 2 – Participants description according to personal antecedents (N = 75), Recife, Pernambuco, Brazil, 2015

Variable	n	%
Hipertension	75	100
Diabetic	33	44
Non-diabetic	42	56
Renal disease	9	12
No renal disease	66	88
Smoker	1	1.3
Non-smoker	74	98.7
Alcohol Consumption	4	5.3
No Alcohol consumption	71	94.7
With dyslipidemia	72	96
Without dyslipidemia	3	4
Sedentary	55	73.3
Non-sedentary	20	26.7
Medications		
Up to 6 medications	54	72
> 6 medications	21	28

Table 3 shows results of average and standard deviation of physical, psychological, social relations and environment domains and patient's QOL self-evaluation.

Regarding facets scoring on a 0 to 100 scale of WHOQOL-Bref, the results for physical domain are: pain and discomfort (34.67); energy and fatigue (50.00); sleep and rest (58.33); mobility (54.67); activities of daily living (51.00); dependence on medical substances and medical aid (65.33); and work capacity (47.33). Concerning psychological domain, the facets are: positive feelings (51.00); thinking, learning, memory and concentration (60.00); self-esteem (68.67), bodily image and appearance (75.67); negative feelings (34.67); spirituality, religion and personal beliefs (64.67)

With regard to social relationships domain, the facets are: personal relationships (72.00), social support (67.67), and sexual activity (51.33). Regarding environment domain, the facets are: freedom, physical safety and security (55.00); home environment (68.33), financial resources (37.67); health and social care: accessibility and quality (57.00); opportunities for acquiring new information and skills (57.67); participation in and opportunities for recreation/ leisure activities (42.67); physical environment: (pollution/noise/traffic/climate) (65.00); and transport (50.00).

Some facets do not show a positive association (pain and discomfort, negative feelings, dependence on medical substances and medical aid), which means that for these facets, high scorings do not indicate better QOL. Therefore, these scorings need to be inverted so that higher values indicate better evaluation of QOL.

With regard to scoring for each domain, psychological presented better result (64.22), followed by social relationship (63.67), environment (54.17) and physical (51.62) domains. The total scoring was 57.44. These results show that all domains present results for which QOL needs improvement.

Table 4 shows results of QOL evaluation according to sociodemographic and clinical variables. Data statistically significant present p < 0,005.

Concerning sociodemographic variables, patients from Recife/metropolitan area present worst evaluation of social relationships domain (p = 0021) and low income patients had the worst evaluation of environment domain (p = 0,021). Regarding clinical variables, diabetics (p = 0.002), smokers (p = 0.047) and alcohol consumption (p = 0.035) had the worst physical domain evaluation.

Renal patients had worst evaluation of QOL in physical (p = 0.037), psychological (p = 0.008), and social relationship (p = 0.006) domain, and total scoring evaluation (p = 0.009).

Table 3 – Average and standard deviation of quality of life evaluation in physical, psychological, social relations and environment domains (N = 75), Recife, Pernambuco, Brazil, 2015

Domain	Average	Standard Deviation	Coefficient of variation	Minimum value	Maximum value	Amplitude
Physical	12.26	3.34	27.20	5.71	19.43	13.71
Psychological	14.28	3.13	21.95	6.67	20.00	13.33
Social Relationship	14.19	2.92	20.59	5.33	20.00	14.67
Environment	12.67	2.59	20.43	7.00	20.00	13.00
Quality of life self-evaluation	13.79	3.30	23.92	6.00	20.00	14.00
Total	13.19	2.55	19.33	7.23	19.85	12.62

Table 4 – QOL evaluation according to sociodemographic and clinical variables (N=75), Recife, Pernambuco, Brazil, 2015

Sociodemographic Variable	Quality of life (Average ± Standard deviation)									
	Physical domain	p*	Psychological domain	p*	Social Relationship domain	p*	Environment domain	p*	Total Scoring	p*
Gender										
Female	11.63±3.59	0.103	13.84±3.63	0.227	14.49±3.31	0.364	12.32±3.05	0.255	13.84±3.36	0.884
Male	12.89±2.95		14.72±2.48		13.87±2.46		13.01±1.98		13.72±3.27	
Marital status										
In a relationship	12.61±3.55	0.304	14.82±2.77	0.086	14.69±2.47	0.087	12.61±2.54	0.859	14.04±3.16	0.443
Single	11.80±3.02		13.57±3.45		13.53±3.33		12.72±2.67		13.45±3.47	
Schooling										
Until 9 years of study	12.16±3.53	0.711	14.06±3.35	0.347	14.00±3.13	0.379	12.54±2.81	0.522	13.70±3.50	0.729
More than 9 years of study	12.48±2.83		14.82±2.47		14.66±2.27		12.97±1.92		14.00±2.75	
Income										
Until 1 minimum wage	11.85±3.58	0.175	13.81±3.40	0.1	14.21±3.18	0.921	12.13±2.66	0.021	13.36±3.25	0.149
>1 minimum wage	12.93±2.79		15.04±2.47		14.14±2.47		13.55±2.22		14.50±3.29	
Origin										
Recife and metropolitan area	11.87±3.23	0.054	13.98±3.05	0.129	13.78±3.03	0.021	12.54±2.49	0.428	13.52±3.30	0.19
Countryside	13.67±3.41		15.33±3.28		15.66±1.85		13.12±2.95		14.75±3.17	
Occupation										
No work activity	12.11±3.40	0.297	14.19±3.23	0.544	14.12±3.03	0.626	12.60±2.62	0.551	13.85±3.29	0.629
Work activity	13.42±2.50		14.91±2.16		14.66±1.74		13.18±2.32		13.25±3.53	

Clinical variable	Quality of life (Average ± Standard deviation)									
	Physical domain	p*	Psychological domain	p*	Social Relationship domain	p*	Environment domain	p*	Total Scoring	p*
Diabetic	10.94±3.39	0.002	13.49±3.21	0.055	14.10±3.24	0.824	12.25±2.83	0.227	13.21±3.07	0.183
Non diabetic	13.29±2.93		14.88±2.95		14.25±2.67		12.98±2.36		14.23±3.42	
Smoker	5.71±3.26	0.047	9.33±3.10	0.113	12.00±2.93	0.455	8.50±2.55	0.105	10.00±3.28	0.25
Non-smoker	12.34±3.26		14.34±3.10		14.21±2.93		12.72±2.55		13.83±3.28	
Renal disease	10.09±2.50	0.037	11.70±3.09	0.008	11.70±3.63	0.006	11.50±1.71	0.151	11.11±2.02	0.009
No renal disease	12.55±3.33		14.62±2.99		14.52±2.66		12.82±2.65		14.15±3.27	
Alcohol consumption	8.85±3.18	0.035	12.16±2.57	0.168	12.66±3.52	0.288	11.12±2.39	0.223	11.50±1.91	0.155
No alcohol consumption	12.45±3.25		14.39±3.13		14.27±2.88		12.75±2.58		13.91±3.31	
Sedentary	11.84±3.38	0.074	14.16±3.16	0.631	14.23±3.10	0.832	12.50±2.68	0.359	13.60±3.27	0.42
Non-sedentary	13.40±2.98		14.56±3.10		14.06±2.42		13.12±2.31		14.30±3.38	

Note: *Student's t test

DISCUSSION

Results show a population predominantly from Recife/metropolitan area, elderly, low education level and low income. There was no significant difference between the number of male and female participants, and a large part of them do not currently work, most of them are retired and pensioners.

A study that evaluated QOL of 38 patients in post-operative period of cardiac surgery shows data that corroborate with this research, in which most of patients are married, have low level of education and low income, however, only half of participants receive financial aid from the government[11].

Results of the research and of other study[11], show average age similar to others that evaluated QOL of cardiac patients[13]. This data may be explained by the fact that CVD affects mainly older individuals.

With regard to patients having low level of education, it is estimated that the understanding of health orientation and medication treatment prescribed during appointments may be significantly compromised, resulting in risk factor for cardiovascular complications after revascularization surgery.

It is important to emphasize that, educational level does not only express the difference in information accessibility and perspective to benefit from new knowledge, but has a great importance as health determinant[14].

Concerning ethnicity, less favorable groups, such as black population, present consequences of cardiovascular complications more often and higher mortality caused by hypertension, as well as being the primary group responsible for economic impact of non-communicable disease, consequently in its complications[15]. However, considering the high race miscegenation in Brazil and regional characteristics of the population, it is difficult to measure the exact influence of this variable[16].

Regarding income, there was statistically significance between this variable and evaluation of QOL by the instrument used for research, in which patients with lower income presented worse evaluation of QOL. A study on the repercussions regarding hypertension treatment[17] revealed that with regard to socioeconomic development, lower levels present higher prevalence of risk factor of CVD.

Concerning work, the majority of participants do not currently work, which may be justified by older age, that leads to retirement, women widowhood, to which the only source of income are pensions, and unemployment, or for the lack of job opportunities or physical limitations caused by chronic disease.

Results regarding clinical variables show that patients present comorbidities, all of them have hypertension, as well as other important cardiovascular risk factors, as diabetes, dyslipidemia and sedentary lifestyle.

Another study shows similar results for following medical instructions of 92 patients with CAD, all patients had hypertension – and 95.7% had dyslipidemia and 75% were sedentary The risk factor sedentary lifestyle was the only one with similar values in studies that evaluated QOL of patients who have chronic disease and underwent MRV, representing 71.9%[16].

Risk factors such as hypertension may influence QOL of patients that have MRV, in the need of change of lifestyle and also

in the disease diagnosis, which causes them to be aware of silent symptoms and think of the disease as a mortality factor. Moreover, diabetes associated with hypertension increases the cardiovascular risk (twice as much than non-diabetic hypertension patients) and may accelerate not only macrovascular lesion, such as cerebrovascular accident, CAD or peripheral artery disease[19].

It is important to mention that, regarding clinical variables, after a cardiac event it is necessary to establish measures directed to following medical orientations, but also directed to changing lifestyle, since the best therapy is prevention, reducing risk factors[11].

With regard to the number of medications, the amount represents high values, however, it is possible to conclude that, regardless of the amount of medication, the control of therapeutic regimen is referred by patients.

Following medical orientation is the primary factor for reduction of high cardiovascular complications rates among patients. It is necessary a systematic evaluation of care including strategies that emphasize the importance of following medical orientations in the face of a high number of medications[20].

The evaluation of QOL by the instrument WHOQOL-Bref presents results regarding physical, psychological, social relationship and environment domains. The scoring of the evaluation of QOL shows values relatively low and the domain with worst evaluation was physical, which may be cause by the clinical condition of patients of the research. QOL evaluation in general was moderate.

In one study, the average of all domains show higher values than this research, 62.9 for physical, 76.1 for psychological, 74.3 for social relationship and 69.2 for environment domain. For the total evaluation of QOL the result was 75, showing a better evaluation of QOL.

With regard to physical domain, results show the need of improvement. There was statistically significance for diabetic, smokers and alcohol consumption patients, who presented the worst evaluation of QOL for this domain. In a study on QOL and risk factors for non-communicable diseases, the analysis of smokers, alcohol consumption and obesity were associated with a worse evaluation of QOL for physical aspect.

Considering that diabetic patients also have hypertension, values of arterial pressures or its control benefit in the reduction of cardiovascular risk and, consequently, the increase of probability of having a fatal or non-fatal event.

Still regarding these factors, smoking is the most important changeable risk factor among young and elderly individuals and represents the most avoidable premature death. Nicotine increases blood pressure and leads to a higher presence of cholesterol in blood vessels[21].

Alcohol may protect against stroke or coronary disease in individuals that are 45 years old or older, however, in terms of general mortality, adverse effects of drinking prevail over any protection against CAD, even in a high risk population. An important matter when dealing with hypertension patients is the cardiovascular rebound mechanism after repeated alcohol consumption, as well as being an important central nervous system depressant.

Several studies[22] show effects of lifestyle intervention programs in high risk population, and some presented significant decrease in diabetes incidence, others showed beneficial

effects on changing lifestyle over blood pressure control. Interventions in lifestyle seem to be more effective in medicamental treatments. Therefore, lifestyle change should be considered the pillar of interventions.

Social relationship domain presented the second higher score. Social support may relieve stress in crisis situations, inhibit the development of disease and represent an important role in recovery of existing illness, Being considered a protection factor and, therefore, is an important focus of intervention in this specific population[19].

Patients from Recife and metropolitan area present the worse evaluation of QOL for this domain. The result may be justified by the fact that patients live in large urban area (which public transportation does not facilitate mobility), are from a low socioeconomic level, have low level of education, or also because the majority is sedentary. In a study of Aguiar and Farias[23] on QOL of patients who underwent heart transplant, participants had a better perception of social relationship domain with significant data with regard to exercising, which brings patients closer to friends and family, improving their social relationship.

Regarding environment domain, low income patients, that earn up to one minimum wage, present the worse evaluation of QOL for this domain. The facet financial resources contributed to obtaining this evaluation, since 84% presented income lower than two minimum wages. The fact that most of them are elderly and retired/pensioner also contributed to this evaluation. Income frequently decreased is an important socioeconomic factor of daily living and QOL, especially for elderly. Low income should also be considered when evaluating the clinical status of patients and the use of a larger amount of medication[24].

Regarding psychological domain, patients showed a better perception of QOL. All facets contributed to this result, except the facet negative feeling. Negative feeling cause physiological change with negative impact on CAD prognosis and may influence directly in following medical orientation that requires behavioral change[25].

Renal patients had a worse evaluation of QOL in physical, psychological and social relationship domains, which also contributes to a worse total evaluation of QOL. Data of a study on QOL of patients who have renal failure corroborate with the research, indicating that renal patients have lower impact on QOL regarding environment domain. Concerning other domains, a longer period of having the disease resulted in a higher commitment to QOL of patients[26].

Limitations of the study and contributions to nursing, health and public policies

This study shows limitations regarding the sample size and short period for data collection. Therefore, results should not be generalized, but should be analyzed with the purpose of establishing actions that aim to improve quality of life of these patients. In view of this, the expectation is that this study motivates other researches and discussions increasing knowledge about this subject.

CONCLUSION

Patients who undergone MRV surgery had lower scoring in physical and environment domains and association between risk factors and comorbities with worse evaluation of QOL.

The matters regarding QOL of patients in post-operative of cardiac surgery allow consideration of the real necessity of these patients concerning their health condition, personal satisfaction, which may directly help health professional involved in rehabilitation planning, providing subsidy to establish assistance care directed to their real needs, with strategies of health education, as a way to promote health and prevent disabilities.

To comprehend this dimension with another view besides the obvious of clinical conditions seems to provide better perspective of different ways of thinking and acting in health, considering specificity of human beings.

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