

Empowering: the experiences of exercise among heart transplantation patients in Taiwan

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Aim. To explore the experiences of exercise among Taiwanese heart transplant patients on the basis of a grounded theory.

Background. Although studies conducted around the world have proven how important exercise is to heart transplant patients, little information was found about heart transplant patients' exercise experience. In addition, because of different cultural backgrounds, people in Taiwan do not care about 'regular exercise' as much as Americans and Europeans do. Therefore, it is very important to find ways so that they can value 'regular exercise.'

Methods. In-depth interviews were undertaken with a purposive sample of eight heart transplant patients. Data was analysed by repeated verification.

Results. Eight valid cases were separately and thoroughly interviewed while they were exercising at a sports medical centre. The results revealed that 'empowering the new heart' is the core reason for their exercise. During the exercise training process, every participant felt that his or her new heart was filled with power or energy. The 'hardness and endurance' in terms of feeling discomfort in the body was identified at the beginning of post-surgical exercise training. Throughout the process of empowerment, patients experienced the following five interactive behaviour categories: 'self-protection', 'sharing', 'being watched and cared for', 'being aware of the benefits', and 'strengthening the new heart'.

Conclusions. Exercise can empower the new heart. After the exercise training, all patients felt that their new hearts were empowered with energy and vigour, and thus were willing to continue exercising. They even expanded their regimen to include folk therapies such as Tai Chi and breathing exercises.

Keywords: heart transplant, exercise experience, empowerment, grounded theory, hardness and endurance, Taiwan

Introduction

Heart transplant surgery was first conducted in Taiwan in 1987. To the end of April 1997, a total of 194 patients had received this surgery with the 1-year survival rate being 95% (Wei 1997). However, studies indicate a 30–40% reduction in maximum exercise capacity after heart transplantation (Kao *et al.* 1994, Renlund *et al.* 1996). Cardiac allograft vasculopathy is presently the major factor limiting exercise capacity in heart transplant patients (Schwaiblmair *et al.* 1999). Therefore, regular exercise is very important for heart transplant patients because previous studies have demonstrated that exercise helps improve the mental and physical condition of heart transplant patients. As to physical aspects, exercise helps reduce a patient's resting blood pressure, increases maximum heart rate, and increases the maximal or peak oxygen consumption and exercise workload (Kavanagh *et al.* 1988, Block *et al.* 1990, Keteyian *et al.* 1991, Badenhop 1995, Kobashigawa *et al.* 1999). As to mental aspects, exercise helps improve a patient's quality of life, increases the compatibility of the newly transplanted heart to the body, increases mental and social functioning (Kavanagh *et al.* 1988, Niset *et al.* 1988, Block *et al.* 1990, Keteyian *et al.* 1991, Badenhop 1995), and even improves a satisfactory body image (Chen *et al.* 2001).

In Taiwan, a few studies (Shieh 1993, Chou *et al.* 1994) have showed that heart transplant patients could have much better physical functioning after surgery. The most obvious benefits were that asthmatic symptoms could be eased and the body energized, and even the quality of sleep was improved. Regarding exercise capability, about 53% of patients were capable of doing some mild or medium exercise, such as swimming or yoga. The results also revealed that although most heart transplant patients experience better physical function after surgery, they are not really satisfied because they need to take immunosuppressants, which might cause physical complications throughout their lives. It has been reported that around 87.3% of patients felt fatigue after surgery and 74.6% found that their eyesight had changed, thus they tired easily while doing exercise and their physical performance was limited (Wang *et al.* 1998). One study (Chen & Ku 1997) revealed that the mental pressure of heart transplant patients mainly came from the fear of possible complications. In addition, patients may suffer from personal identity disturbance if the heart donor was of a different sex, personality, or body image, or if there was uncertainty about the future (Tsuei 1990).

Regular exercise is not popular among Taiwanese. One study (Lin 1995) showed that, among the 273 Taiwanese

interviewees, only 9.5% maintained the habit of exercising (at least three times per week and more than 15 minutes each time). The reasons people did not exercise were 'no time' and 'no companion'. In addition, because of different cultural backgrounds, people in Taiwan do not care about 'regular exercise' as much as Americans and Europeans do. The major reason is culture. In ancient times, Chinese people spent most of their daily lives in tilling and planting, because ancient China was a country of cultivation. Ancient Chinese people spent most of their daily life in cultivation. They did not spend extra time doing exercise. The labour cultivation was a kind of exercise among their daily living activities. Therefore, they did not have the concept of doing regular exercise to health promotion in traditional culture. Rather, they valued *Gin Pu* (eating Chinese herb with meat to revitalize the body) to promote their health instead of doing regular exercise. However, in modern times, Taiwan has become an industrial country, people do not spend so much time in cultivation, and they spend less time on exercise than ancient Chinese people. Therefore, doing regular exercise to enhance health should be advocated for modern Taiwanese people (Lee 1995).

Very few patients receive regular exercise training programmes after heart transplantation because cardiac rehabilitation has not yet prevailed in Taiwan and because of a cultural background that encourages recovering from illness by eating nutritious food. Although previous studies (Geny *et al.* 1996, Braith 1998) have indicated how important exercise is to heart transplant patients, there have no published reports about such exercise experience in Taiwan. It is very important to explore Taiwanese heart transplant patients' feelings about exercise, and to find ways that they can value regular exercise. Therefore, the experiences of heart transplant patients who strengthened their physical condition through exercise were examined.

The study

Purpose

To explore the following:

- the experiences of regular exercise training for heart transplant patients;
- the meaning of regular exercise training to these patients; and
- the perception of these patients after exercise training.

It is hoped that this study will facilitate the set up of a localized exercise regimen for all heart transplant patients to enhance their physical and mental rehabilitation.

Methods

This study was conducted based on grounded theory using symbolic interaction as a framework (Strauss & Corbin 1990). Grounded theory is qualitative-research orientated and is used to develop a descriptive theory, mainly focusing on studying certain phenomena, or a phenomenon describing personal reactions to certain experiences that have yet to be theorized. The study emphasizes understanding patients' subjective experiences, so as to realize the entire process of certain special experiences. The process is elaborated by means of the connections among every circumstance, process, meaning, and action (Strass 1993). The study was conducted with systematic data collection and data analysis, and with repeated verification, until no new data were found, thus reaching a stage of 'saturation' or, ultimately, a theory. The symbolic interaction theory (Blumer 1969) enables a researcher to understand the exercise experiences and feelings of heart transplant patients in a more-sensitive manner.

Sample

The selection criteria for participants included: (1) those heart transplant patients aged between 18 and 70 years; (2) those who could speak Mandarin or Taiwanese; (3) those who currently participate in the exercise programme; and (4) those who agreed to share their exercise experiences. There were a total of eight cases in this study. There were three men and five women. All were married and aged between 40 and 64, with a mean of 55.9 years old. The participants' post-surgery period, ranged from 9 months to 6 years and 5 months, with a mean of 2.6 years.

Ethics

The study was approved by the Investigation Committee of the study institution. The investigator provided a thorough explanation of the study protocol and informed consent was obtained from each participant. All participants were guaranteed strict confidentiality and anonymity, and were allowed to withdraw from the study at any time.

Data collection

In-depth interviews were conducted with heart transplant patients who had already taken part in a treadmill exercise programme at a sports medical centre. The programme was three times a week for 10 weeks and the exercise intensity was set between 40% and 80% of maximal heart rate. The researcher invited these interviewees to an assigned meeting room and conducted thorough individual interviews according to the agenda, which mainly concerned the exercise experience of the patients before and after they participated

in regular exercise training. The interviewees allowed simultaneous recording of the conversations and their body language, such as facial expression, tone of voice, and their reactions were noted, to be used as a reference for data analysis. The interviews lasted around 1 hour, and the data collection and analysis were conducted immediately after the interview. In keeping with grounded theory, methods were incorporated into the interviews as patterns emerged from the data. The second interview would be conducted to validate the founded category. This interview focused on the evaluation of the participants' stories of how they experienced the exercise after heart transplantation. Interviews continued until the data was saturated and dense.

Data analysis

The constant comparative method was used to analyse contents from typed transcripts and field notes. The body language during interviews was recorded in field notes. In grounded theory, data collection, coding, and analysis is part of a simultaneous process from the beginning of the study to its conclusion. Each line, phrase, sentence, and paragraph from the transcribed interviews and field notes were read and analysed many times and reviewed for similarities, differences, general patterns, and codes (Strauss & Corbin 1990). Finally, an abstract category was used to set up a framework to describe the process of heart transplant patients' exercise experiences, from open coding to axial coding, revealing the core category, setting up a story line, and using a theoretical structure to explain the relations between the antecedent category, the interaction category, and the consequence category.

The core category describes the patient's frequent behaviour or feelings during the entire exercise experience. The antecedent category contains the experience and feelings of the patient before exercising, and describes how he or she joined the exercise training in the beginning stage. The interaction category contains the behaviour or feelings of the patient during the training programme, and the consequence category contains the experiences, behaviour, or feelings of the patient after exercising training. In accordance with Sandelowski (1986), four requirements (credibility, application, dependability, and neutrality) were used to examine the rigor of the study.

Findings

Theoretical framework

A theoretical framework was generated in the study (Figure 1). 'Hardness and endurance' is the antecedent

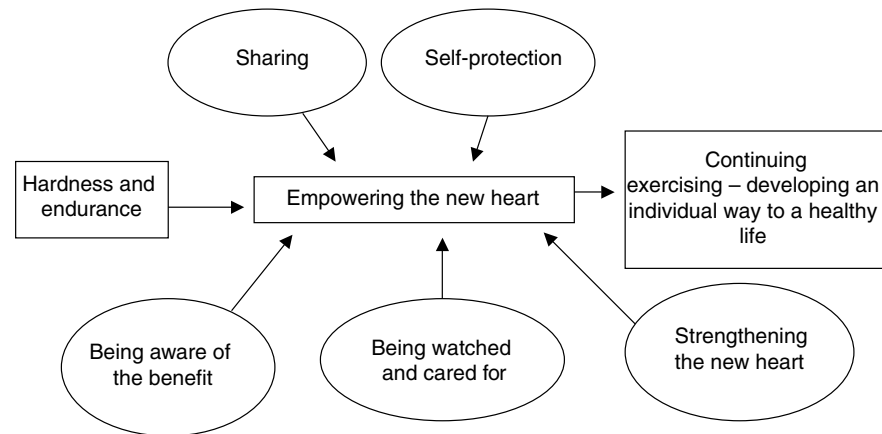


Figure 1 Theoretical framework of empowering the new heart.

category for this process in which the patient has to endure or force him or herself to exercise during the preliminary stage of exercise training, then he or she enters the next exercising stage of 'empowering the new heart'.

During the process, heart transplant patients experience the following interactive behaviour categories: self-protection, sharing, being watched and cared for, being aware of the benefit, and strengthening the new heart. Patients feel the empowering of their new heart during exercise training and experience the behaviours and feelings described as above. These interactive behaviours exist simultaneously, and take place repeatedly throughout the entire exercise process.

'Empowering the new heart', a core category of this study, is about how a patient continuously feels the new transplanted heart being filled with power during exercise, and thus realizes great improvements physically and mentally. When the patients experience the process of 'empowering the new heart', they discover the importance of 'continuing on exercising – developing an individual way to a healthy life', which is the consequence category for this process. Patients continuously experience the physical and mental benefits from exercise and continue exercising, and even learn how to lead or maintain a healthy life by themselves.

Hardness and endurance

Some of the patients said they were worried and concerned if their new hearts could withstand the exercise load when they started to exercise. They also felt some discomfort in their bodies, such as panting, tiredness, or aches. Most of the patients endured to help themselves overcome the hardness period during the preliminary stage of exercise training because they knew if they did not, their body energy would never recover. One patient said:

It really hurt when exercising soon after the operation, it hurt very much! I could hardly explain the painful feeling! I had a Filipino maid

at that time, and she was trying to help me walking, but I did not allow her to. I insisted on walking by myself. I kept walking and walking, and it was very painful. I tried to apply some pain relieving ointment that would cool me off a little bit, and then I continued to walk and walk...And it's been more than 2 months since then, now I no longer feel any pains or aches.

Being aware of the benefit

Patients continuously experienced physical and mental improvements from exercise training, such as enhanced physical vigour, appetite, sleep, excretion, sexual life, and appearance. They also became more confident, more outspoken, and more optimistic.

Talking about the change after exercising, one patient said:

I used to be afraid of moving my body. Now whenever I go to the hospital, I walk upstairs or downstairs using the stairways, not elevators, no matter whether it's 3 or 4 floors, I just walk around vigorously. People are curious about why I can walk around this way. I just feel very energetic. Even after a long route I do not feel tired.

Talking about the mood improvement after exercising, one patient said:

I am very happy to share my experience with you, I did not dare do any exercise before, because after staying in the hospital for a long time, I felt every one of my muscles had degenerated. I could not walk. I seldom exercised. The doctor and nurse kept asking me to do some exercise, and later on they recommended that I come here to take the exercise training. I did experience something good for my body through exercise; everything has become sort of very energetic to me now.

Being watched and cared for

During exercise training, there are relevant monitors or instruments being used to watch the body condition and to

adjust the exercise load for each of the patients when necessary. There are also doctors and nurses standing by to care for and encourage them; thus, the entire process is very safe, workable, and constructive. One patient said:

This is my first time here. I feel very comfortable here. The instruments are good. The nurses are very enthusiastic in teaching us how to do the exercise, and encouraging us to do it on a time schedule. This is good because we have all the instruments for measuring blood pressure, heartbeat, etc. here. I do not worry about any possible problems occurring while exercising in the hospital. The doctors and nurses are always there and available to look after us.

Self-protection

When the patients began the exercise training, they encountered some physical and mental challenges. Although they knew that exercise was good for them, they were anxious about exercising outdoors. Sometimes they were afraid of being affected by certain diseases and sometimes they felt uncomfortable after an improper exercise load. Therefore, they would improve the training and protect themselves by taking some precautions, or adjusting the way of exercise to fit themselves. One patient said:

Whenever there are contagious diseases, such as the flu, prevailing out there, I would not go out anywhere. Most of the time I would stay at home. If I need to go to some place, I would ask if anybody there had the flu. If anybody was coughing or sneezing in the hospital, I would leave immediately. Otherwise, I would put on mask to prevent myself from being affected by some virus in a sealed room, even if it was an air-conditioned room.

Sharing

While doing exercise with some ward mates, patients could compare body conditions with each other, chat or help each other, and share experiences. They felt very happy, comfortable, and more confident while exercising. One patient recalled:

We would chat while walking, sharing everybody's experiences or problems for each others' reference. This was good for us, because we took them as examples when we encountered similar problems and then we knew how to solve them according to others' past experiences.

Strengthening the new heart

Some patients stated that the motivation for exercising was to strengthen their new hearts. They thought the new trans-

planted heart needed training and working out, otherwise it would become lazy or atrophied. One patient said:

I do exercise to allow my heart to beat faster and faster. The more you lie down, the lazier your heart becomes. That's true! You should not be afraid of pushing your heart too much; you should exercise it and make it pant for at least some time each day.

Empowering the new heart

Patients considered that exercise training had the function of strengthening their new hearts, and they could feel their hearts becoming more powerful during the exercise training process. A 62-year-old patient reported the following when asked about their feelings during exercise training:

After I attended the exercise training, it seem my heart was strengthened naturally. I used to be very afraid of it...I thought that, in a sealed room, if somebody caught a cold, I would no doubt be affected. However, after exercise training, things changed a lot, and it seems I seldom am affected by the flu now. I have become more powerful fighting against all disease. Now I can climb up to Warship Cliff without any problem. I could never make it before!

Continuing on exercising – developing an individual way to a healthy life

When talking about their feelings after exercising, all patients felt that their body and heart conditions had improved a lot after exercising; they felt that they had come back to real life again. They would try to continue exercising during their everyday lives, and even try to find alternative ways to maintain a healthy life by the use of some traditional Chinese exercises, such as Tai Chi Chinese boxing, breathing therapy, or Yuan-Chi dance. Talking about the way of exercising, one patient said:

Now I often do Yuan-Chi dance in the park. I used to simply walk, but after taking the exercise training here. I started to do the Yuan-Chi dance with others. I do not feel very tired doing it, but it has become easier than before for me to fall asleep without taking any medicine. I go to the park everyday, dancing until I sweat.

Another patient that is currently taking breathing therapy said:

We have to do some breathing therapy every morning and every afternoon, mostly after 5:00 p.m. Even walking in the park would be good enough. It's not necessary to use the breathing therapy every time. If I get some problem with leukopenia, I will be easily

affected by some disease. So I have to keep my body in good condition, so I choose to practice the breathing technique, then my body can be strong enough to fight back against all the viruses out there.

Discussion

Hong (1996) translated 'empowerment' into Chinese as *guan-neng* which is derived from the Chinese idiom, *ti-bu-guan-ting*. This idiom is a metaphoric Buddhist saying which means that whenever a person's mind is filled with wisdom, he or she will feel cool and comfortable, even in a hot environment. During exercise training, the heart transplant patients felt more confident about themselves which prompted them to choose other Chinese ways of exercising, such as Yuan-Chi dance, breathing technique therapy, or Tai-Chi Chinese boxing to keep exercising after the training programme was completed. From the viewpoints of nursing, 'empowering' is processing, enabling, or sharing power (Wang *et al.* 1998). In this study, for all the patients, exercise training was like a *ti-bu-guan-ting* process. The patients continuously felt their hearts being strengthened after taking exercise training while, at the same time, they felt their physical and mental conditions were improving. The patients did experience how exercise helped them instil 'power' into their new heart and body.

In this study, during the empowering process, patients constantly felt that they were 'able' to doing something they had not dared to do before. Some patients felt that their resistance to infectious disease had been strengthened after exercise training, thus they dared to go to public places or meet friends frequently. Results of previous studies have demonstrated that exercise training can increase peak oxygen consumption of heart transplant recipients by 18% (Savin *et al.* 1983) to 27% (Kavanagh *et al.* 1988). Some patients in the current study felt that they were more energetic and more outspoken, and could do things in a more optimistic way. One patient reported he had a stronger sense of 'sportsmanship' after exercising; he could do things in a more optimistic or aggressive way than he had dared to do before.

At the beginning of exercise training, patients had to 'stand or endure' the hardness and force themselves to begin the exercise process. However, during the process they constantly felt their new hearts being filled with power. As mentioned above, their interactive behaviour categories were: being aware of the benefit of exercise, strengthening the new heart, being watched and cared for, and sharing and self-protection. From the interviewees' viewpoints, the authors realized that it was important to create a thoughtful exercise programme; to extend as much encouragement as

possible to patients; to fully support all patients so that they can overcome the hardness and powerlessness at the beginning of exercise; and to provide proper health care information so that they can have a better ability to protect themselves. In addition, the findings of this research showed that most patients expressed that they have achieved a better look after exercising. This result is similar to research done by Chen *et al.* (2001), which found that exercise training helps to satisfactorily improve the heart transplant patients' body image.

In the preliminary hardness stage of exercise, patients overcome their reluctance by 'endurance', and thus they are able to achieve progress. They also take some 'self-protective' actions, such as putting on a mask, or choosing to go to proper public places, in order to avoid being affected by disease. Gibson (1991) defined empowerment as the process of helping people control their health factors. In this study, as a result of the empowerment brought about by exercise training, patients felt they had better control over their own body health factors and tended to do good things to protect their own bodies.

Some patients said they would strengthen their new hearts by doing exercise because they thought the longer the heart was in a motionless status the lazier it became; the heart needed to be stressed or trained. Some patients thought that exercise could help the heart work out, so they made their heart beat really fast on purpose, but they would rest if any uncomfortable feelings arose. Maybe the patients were trying to test their new hearts, or possibly trying to make themselves compatible or 'unified' with their new hearts or, as mentioned in certain documentation (Chou & Liu 1997), people always instinctively challenge themselves continuously during exercise training.

Some patients used certain traditional methods to protect themselves or to create a healthy life, such as Chi exercise or herbal medicine. According to one study (Hu 1997) that investigated how 2000 Taiwanese families, either from cities or from counties, acquired medical treatment, about half of the families from the countryside and approximately two-thirds from the cities used at least three kinds of traditional therapies. In this study, the researchers also noticed that some patients would use herbal medicine as a diuretic, or participate in breathing technique therapy or Yuan-Chi dance to enhance their health. If any of these methods were effective, they would discuss it with their other ward mates. This reveals that even heart transplant patients believe in traditional therapies and use them. However, because of the lack of education and systematic management of these traditional therapies, most people cannot determine the advantages or disadvantages of their use. This being the case, the idea of

using folk or traditional therapies to empower the new transplanted heart is worthy of attention and advanced study from the medical profession. Following and surveying Chinese ways of healthy living developed by patients will be the focus of a future study.

Study limitations

In this study, patients exercised under professions' supervision, which provided a safety environment for them. Therefore, the results of the study cannot be generalized to patients who exercise on their own. In addition, because of the small number of heart transplant patients in Taiwan, those willing to participate in the research were few. In the future, more studies are needed to verify the qualitative findings of this study.

Conclusion

The experiences of exercise among these eight heart transplant patients revealed that exercise could empower the new heart. During the exercise training process, every participant felt that his or her new heart was filled with power or energy. The 'hardness and endurance' in terms of feeling discomfort in the body was identified at the beginning of postsurgical exercise training. Throughout the process of empowerment, patients experienced the following five interactive behaviour categories: 'self-protection', 'sharing', 'being watched and cared for', 'being aware of the benefits', and 'strengthening the new heart'. The findings can help health providers' cultural sensitively to take care of new health transplantation patients in Taiwan to initiate their doing regular exercise.

Implications for nursing practice

This is the first study conducted to explore the exercise experience among heart transplant patients. It was concluded that all patients felt that they were empowered with energy and vigour after 10 weeks exercise and were willing to continue exercising. Although there were only eight cases in this study, every participant had been participating in exercise training for a long time and every case had been vertically traced on a long-term basis. Therefore, the data obtained from this study could serve as a reference of the benefits of doing regular exercise from the point of view of heart transplant patients.

The findings of the current study revealed that the experiences of performing regular exercising among heart transplantation patients are subjective. Therefore, in the initial stage after heart transplantation, when patients feel hardness and endurance, nurses should listen to their com-

plaints about their fatigue, encourage them to keep on exercising, and accompany them during exercising to increase their sense of safety. These strategies can help the patients get started with an exercise regimen. In addition, Chinese people believe that *pu* (a way to revitalize by taking Chinese herb and eating nutritious food) can improve health status during the postoperative period (Lee 1995). The role of exercise for promoting health is as important as *pu* in improving health in Chinese people and should be emphasized through health education, patients should be informed, that exercise can play the same role as *pu* in improving their health.

After the exercise training, all patients felt that they were empowered with energy and vigour. According to the behaviour categories of subjective exercise experiences for heart transplant patients, a culturally sensitized and humanized cardiac rehabilitation centre needs to be established. Health professionals in the centre should be taught how to establish a ward mate association so that every patient can share his or her experiences with each other. Health professionals should also be mentally in tune with patients and encourage them to conquer all the hardness and endurance they encounter when starting to exercise, be capable of intensively monitoring the symptoms for patients during exercise, point out and share happiness with patients for their improvements in heart and body vigour and sensations, and be able to offer an exercise method that combines both eastern and western styles.

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