Graduate School of
Business Administration

KOBE UNIVERSITY

ROKKO KOBE JAPAN

2010-6

Intrinsic Motivation of Organ Transplant Coordinators
in Europe and Japan

Yoko Uryuhara Norio Kambayashi Tomoaki Shimada

Discussion Paper Series

Intrinsic Motivation of Organ Transplant Coordinators in Europe and Japan

Yoko Uryuhara, Norio Kambayashi, and Tomoaki Shimada

ABSTRACT

Deceased organ donation is much less prominent in Japan than it is in Western countries. Since organ shortage is a serious social problem in Japan, various solutions to the problem have been considered. Although it was believed that the most critical factor in the organ shortage was the absence of a well-established in-hospital system to convert potential donors into actual donors, no prior studies attempted to analyze the problem from the perspective of the intrinsic motivation of in-hospital coordinators. Thus, we conducted a questionnaire survey in Europe and Japan to identify the characteristics of in-hospital coordinators, who play crucial roles in organ donation. We compared job satisfaction, pride in one's work, professionalism, job core dimensions based on Hackman and Oldham's Job Characteristics Model, and job responsibilities among 43 European and 73 Japanese in-hospital coordinators. Our results demonstrated that the European coordinators have higher levels of skill variety, task identity, task significance, autonomy, and feedback in their job characteristics, take more pride in their work, and exhibit more professionalism in their jobs than the Japanese coordinators. These three factors also lead to their job satisfaction and high job performance. These findings imply that the Japanese coordinators need motivation to improve the process by which potential donors are selected as actual donors. We suggest that if the job responsibilities of the Japanese coordinators were redefined, they were provided with systematic education and training to foster their professionalism, and they received the recognition of healthcare professionals and the public, they would feel a greater sense of pride, and this would promote increased organ donation in Japan.

Keywords:

Organ donation; in-hospital coordinator; intrinsic motivation; job characteristics model; survey research; Europe and Japan

Version: June 6, 2009
(The old version was accepted and presented in the 68th Academy of Management Annual Meeting in 2008.)

INTRODUCTION

Issues Concerning Organ Donation in Japan

The "Organ Transplant Law" was enacted in Japan on October 16, 1997, and yet, there have only been 61 brain dead donors over the past 10 years, which is a very small number as compared to other countries. The number of deceased donors per million in the Japanese population was only 0.7 in 2005, and this number represents the lowest level in the world, as shown in Figure 1[1].

Insert Figure 1 about here

As a result, Japan is facing the following four social problems. (1) More than 2,000 patients die annually because they are unable to receive an organ transplant; (2) the lack of opportunities for renal transplant has resulted in an increasing number of patients who require dialysis[2], which has consistently weighed on the national medical expenditure (roughly 7% of the total amount of 30 trillion yen in 2005)[3]; (3) a ceaseless stream of patients seeking transplants abroad has raised ethical questions internationally regarding whether Japan is committed to the self-supply of organs for those in need; and (4) while organ transplantation relies on the populations' altruistic organ donation, in many cases, the intention of such people is not

[1] The Japanese data were obtained from the Japan Organ Transplant Network homepage and the European data from "International figures on organ donation and transplantation-2005," Transplant Newsletter-Council of Europe, Vol.11, No.1, 2006.
[2] According to the Japanese Society for Dialysis Therapy, 257,765 patients require dialysis as of the end of 2005.
[3] According to Roels *et al*. (2003), an average 59% increase in organ donors, as realized in countries that have implemented the Donor Action program, would allow a significantly greater number of dialysis patients to receive a renal transplant, resulting in a decrease of 2.26 million Euros in the medical expenditure per million people. Whiting (2004) reported a similar medical cost reduction of 1 million Canadian dollars in Canada.

appropriately reflected in the medical setting[4], resulting in "infringement of the right of expectation" against Article 2 of the Organ Transplant Law (fundamental principles)[5].

Reasons for the Organ Donor Shortage in Japan

The Japanese perception of organ donation is very positive. In the "Public Opinion Poll on Organ Transplant" conducted by the Cabinet Office in November 2006, 41.6% of a total of 1,725 respondents aged 20 years or over replied that they were "willing to donate" organs in the event of brain death, surpassing those who answered "not willing to donate" (27.5%). These results lead to the question of why there is a chronic organ donation shortage in Japan. Although there are many factors involved, the most critical one is the absence of a well-established in-hospital system that arranges for the potential donors brought into donor hospitals to become actual donors. As shown in Figure 2, the process by which a potential donor becomes an actual donor comprises six steps, all of which are implemented at the hospital. As compared to other countries, the organ donation shortage in Japan appears to be the result of the unsatisfactory execution of this in-hospital process.

Insert Figure 2 about here

Research Questions

In Japan, organ donation shortage is attributed mainly to in-hospital factors. Spain, which has the largest number of organ donations in the world, experienced similar problems in the

[4] Of the deceased persons who had expressed their intention to be posthumous organ donors during their lifetime, 6.6% actually donated organs, which is extremely low in comparison to other countries (*e.g.*, 48.1% in Spain, 48.9% in France).
[5] Article 2 in Organ Transplant Law (fundamental principle: "The wishes of deceased persons who, during their lifetime, expressed their intention to donate their organs for the purposes of transplantation shall be respected.")

1980s. Thus, it was mandated that there would be at least one in-hospital coordinator[6] in a donor hospital, and he or she would have clearly defined required personal characteristics and job responsibilities, and the hospitals where the coordinators were assigned would be staffed by the appropriate personnel who would be entrusted with the authority and responsibility to execute the entire organ transplant process to highly motivate them. Correspondingly, a national network was established to support the coordinators.

Although in-hospital coordinators exist in Japan, their motivation is not high, and this is due to ambiguously defined requirements for personal characteristics and job contents. The result of such a situation is deemed to be the failure to improve in-hospital process control, thus creating an organ donation shortage. Therefore, against this backdrop, we conducted our research to identify the characteristics of in-hospital coordinators in high performance countries where many organ donations are undertaken (*i.e.*, European countries) and to present specific proposals to increase the number of organ donations in Japan.

LITERATURE REVIEW

Job Characteristics Model

Motivation theories include content theories such as Maslow's (1954) need hierarchy theory, Alderfer's (1972) ERG (existence, relatedness, and growth) theory, Herzberg's (1966) motivation-hygiene theory, and Deci's (1975) intrinsic motivation theory, and process theories such as Vroom's (1964) expectancy theory and Hackman and Oldham's (1975, 1976) Job Characteristics Model. The Job Characteristics Model states that jobs with higher levels of core job dimensions (*i.e.*, skill variety, task identity, task significance, autonomy, and feedback) lead

[6] Medical professionals who are responsible for the six steps of organ donation in donor hospitals. In Spain, they are called "TPM (Transplant Procurement Management) specialists."

to greater intrinsic motivation and higher performance. This causal relationship varies depending on the moderator variable of "growth need strength" of each individual.

Tao (1987) provided relevant data on healthcare professionals. He assessed the effects of the moderator of growth need in 1,391 nurses from 8 hospitals (all females; mean age: 28.5 years old; registered nurses: 84.7%). Growth need was shown to have both a summation effect and a strong motivating effect.

Pride in One's Work

Fujita (2000) stated that "pride in one's work" is an emotional state that is built in the cognition of external information such as social evaluation, and is subject to change depending on the input information, through the cognitive activity involved in processing the information. According to an empirical study conducted on white-collar employees in the finance, service, utility, and manufacturing sectors, pride in one's work strongly defines the level of motivation, either directly or via the employee's sense of self-determination, which influences what he or she does. This finding indicates that greater pride in one's work leads to higher intrinsic motivation, and thus, higher performance.

Professionalism

In recent years, the subject of professionalism in medicine has attracted increasing attention. In 2002, "Medical Professionalism in the New Millennium: A Physician Charter" was announced by the ABIM (the American Board of Internal Medicine) Foundation, ACP-ASIM (the American College of Physicians-American Society of Internal Medicine) Foundation, and European Federation of Internal Medicine. Cruess (2006) stated that medical professionalism is

the basis of the contract between medicine and society, and that it reaches beyond one's code of ethics and includes relationship building with patients, learners, and society beyond one's code of ethics, and defines one's behavior.

The only available data regarding the motivation and performance of healthcare professionals working in professional institutions were obtained from Tao (1987). This study involved 1,391 nurses from 8 hospitals. Tao failed to show that professionalism is a moderating factor for the job characteristics model. The relationships between the level of professionalism and the levels of motivation, job satisfaction, and performance are yet to be determined.

HYPOTHESIS DEVELOPMENT

Based on our literature review, we created the analysis model provided in Figure 3. Based on this model, we compared the in-hospital coordinators in a high performance organization (*i.e.*, Europe) with those in a low performance organization (*i.e.*, Japan) to identify the characteristics of European in-hospital coordinators.

Insert Figure 3 about here

The hypotheses tested herein are as follows.

Hypothesis 1: European in-hospital coordinators are satisfied with their jobs.

Hypothesis 2: The job characteristics of European in-hospital coordinators are associated with high levels of skill variety, task identity, task significance, autonomy, and feedback, and these lead to high performance.

Hypothesis 3: European in-hospital coordinators take pride in their work, which leads to job satisfaction and high performance.

Hypothesis 4: European in-hospital coordinators perform their role with professionalism, which leads to job satisfaction and high performance.

We set our questions on the basis of the dimensions of the analysis model. "Job satisfaction" and "high performance" were selected as outcome parameters and "job core dimensions," "pride," and "professionalism" as motivating factors. The questions on job core dimensions were prepared by referring to the questions that were developed for Tao's (1987) research on job characteristics, with appropriate rewording given the job status of the in-hospital coordinator. The questions on specific job contents were formulated by referring to the job description of Spanish in-hospital coordinators. The answers to the questions were provided on a 5-point Likert scale (*i.e.*, 5: strongly agree, 4: somewhat agree, 3: neither agree nor disagree, 2: somewhat disagree, 1: strongly disagree).

Insert Table 1 about here

RESEARCH METHODS

A questionnaire survey was administered to Japanese and European in-hospital coordinators. Complementary interviews were conducted with three European experts and one Japanese expert in the field to facilitate the interpretation of the analysis results and to obtain further findings.

Questionnaire Survey

Target. In Japan, 107 in-hospital coordinators in 2 different prefectures were approached. Currently, there are approximately 1,000 in-hospital coordinators working in Japan. The two

prefectures were selected because they represented the Japanese average with respect to the timing of the in-hospital coordinators' introduction and the number of organ donations, and all of the in-hospital coordinators in those prefectures were included in the survey. In Europe, 123 in-hospital coordinators in 20 countries—Norway, Sweden, Finland, Denmark, the Netherlands, Germany, Belgium, France, Switzerland, Spain, Israel[7], Italy, Greece, Poland, the Czech Republic, Croatia, Slovenia, Slovakia, Romania and the U.K.—were approached to ensure a representative European sampling.

Methods. Based on the assumption that the respondents would take time out from their work to complete the questionnaire, 20 questions regarding their job and 10 questions regarding their personal profile were selected for the survey so that the time required to complete the questionnaire would be no more than 5 minutes. The Japanese version of the questionnaire was reviewed by three Japanese coordinators before it was finalized and the English translation version was reviewed by the chief European coordinator (Scientific Program director of the International Transplant Coordinators Society). In both Japan and Europe, the questionnaire was distributed and collected in such a manner as to ensure the anonymity of the respondents, with their IT environment taken into consideration. Since many of the in-hospital coordinators in Japan are not provided with their own personal computer at their worksites, it was assumed that it would be unreasonable to expect them to fill out and return the questionnaire form on the PC. Therefore, printed questionnaire sheets were sent to the Japanese coordinators and they were asked to return the completed forms by mail using the enclosed envelope. For the survey in Europe, an e-mail was sent to the representative of each target country via the chief European coordinator, and the e-mail was transferred to the target in-hospital coordinators by the representative of each country. The questionnaire was completed either on the website or as an

[7] Israel is not a European country, but the European Transplant Coordinators Organization (ETCO) categorizes Israel into Europe.

MS-Word file and sent via e-mail, depending on the IT environment of each respondent. The survey period was between May 22, 2007 and June 11, 2007.

Possible biases in the questionnaire survey. The questionnaire prepared in English was used for the European in-hospital coordinators including non-native English speakers. A possible bias may have been introduced by the selection of only target coordinators who understood English prior to transferring the questionnaire from the representative of each country to individual in-hospital coordinators, and by the possible misinterpretation of questions by respondents whose native language was not English.

Interview Survey

Interviewees. As persons capable of interpreting the survey analysis results, those in a position to organize the in-hospital coordinators were selected. In Japan, Ms. Mariko Nishimura, a prefectural coordinator, was interviewed. For the survey in Europe, Mr. Leo Roels (Scientific Program Director of the International Transplant Coordinators Society; Managing Director of the Donor Action Foundation), Dr. David Paredes (Nephrologist at Hospital Clinic de Barcelona; Head of the Transplant Procurement Management (TPM)), and Ms. Gloria Paez (Manager of the TPM) were interviewed.

Methods. For the survey in Europe, semi-structured interviews that were approximately one hour in duration were conducted on July 9 and 11, 2007. For the survey in Japan, the results of the questionnaire were presented to the interviewee and an interview that was approximately 20 minutes in duration was conducted on August 4, 2007 to obtain comments on the overall results.

Analysis methods. For each question, the count and percentage of respondents at each scale point and cumulative percentage were obtained separately for the Japanese and European respondents. The mean points were calculated as follows: 5 points for "strongly agree," 4 points for "somewhat agree," 3 points for "neither agree nor disagree," 2 points for "somewhat disagree," and 1 point for "strongly disagree." Moreover, the mean difference between Japan and Europe was tested using a one-tailed t-test to determine statistical significance. The level of significance was taken at $p < 0.05$.

RESULTS

Responses were obtained from 43 coordinators from 11 European nations (Belgium, Finland, Israel, Italy, Norway, Poland, Slovenia, Spain, Sweden, Switzerland, and the U.K.) at a response rate of 35.0%, and from 73 coordinators from 2 prefectures in Japan at a response rate of 67.6%. The interview outcomes indicated that the low response rate in Europe could be attributed to two factors: there was no response from Germany, which has the largest number of in-hospital coordinators among the surveyed countries, and the questionnaire was written in a language that was not the native language of most of the target coordinators.

Respondents' Profiles

Table 2 summarizes the respondents' profiles and shows chi-square test results of variance difference between Europe and Japan. Complementary explanations are provided below for each item where statistical significance was detected.

Insert Table 2 about here

Age. The mean age of the respondents was higher in Europe than in Japan. Those aged 50 years or over constituted 43.1% of the respondents in Japan, while in Europe, this rate was low at 16.3%.

Professional category. In Europe, 100% of the respondents were medical professionals (*e.g.*, medical doctors, nurses, clinical laboratory technicians, pharmacists), while in Japan, 34.2% were non-medical staff (*e.g.*, administrative staff and others). There was a statistically significant difference between Europe and Japan. In the interviews with the European experts, the following account was given: the personnel lacking a qualification in the medical field are not regarded as fellow workers by the ICU (Intensive Care Unit) staff, where organ donation is undertaken. Furthermore, the explanations of the definition of a potential organ donor and the administrative measures provided to doctors and nurses cannot be considered reliable when they are given by someone without satisfactory medical knowledge or experience in the medical field. The post of in-hospital coordinator should be assumed only by someone in the medical profession. Whether a medical doctor or a nurse is suitable for the post of in-hospital coordinator depends on the location in Europe. In Southern Europe (Israel, Italy, Slovenia, and Spain), 23.1% of the coordinators were nurses, while in Northern Europe (Finland, Norway, Sweden, and the U.K.), the rate was high at 100%. The educational level of nurses and demand for medical doctors were suggested as factors to explain the result because, in general, the level of education of nurses is higher and the number of medical doctors is lower in North Europe than in South Europe.

Field of specialty. In Europe, 51.2% of the respondents specialized in anesthesia, ICU/emergency, and neurosurgery, where potential donors are managed, while in Japan, the rate was low at 9.6%.

Experience as an in-hospital coordinator. The years of experience as an in-hospital coordinator were significantly ($p < 0.001$) higher in Europe than in Japan. A possible explanation for this is that in Japan, the in-hospital coordinator system was introduced fairly recently.

Percentage of the in-hospital coordinator work as compared to the full job profile. In Europe, 39.5% of the respondents were categorized as full-time workers and 60.5% as part-time workers. Among those respondents who were working part-time, 61.5% answered that the percentage of in-hospital coordinator work was less than 25% of their responsibilities. In the case of Japan, all the in-hospital coordinators worked part-time, and 100% of the respondents said that the ratio of coordinator work was less than 25%. There was a statistically significant ($p < 0.001$) difference between the two groups.

Organ transplant program. In Europe, 76.2% of the respondents answered yes when asked whether their hospital had a transplant program, while in Japan, the rate was low at 35.6%. There was a statistically significant difference ($p < 0.001$) between the two groups.

Europe-Japan Comparison of Performance

Performance was defined as "organ donations per million persons" in 2005. The number of organ donors per million in the 11 European respondent countries was 19.4, as opposed to 0.7 in Japan, demonstrating a higher performance in Europe.

Hypothesis 1: European in-hospital coordinators are satisfied with their jobs

The Europe-Japan comparison of the answers to the question about job satisfaction, "1-8: I am satisfied with my job as an in-hospital coordinator," is shown in Table 3. The level of job satisfaction was significantly ($p < 0.001$, t-test) higher among Europeans. The effects of the

differences in the respondents' profiles were examined, but no influential factors at the 5% significance level were detected.

The interview outcomes indicated the presence of a virtuous cycle among the European in-hospital coordinators, *i.e.*, compared with the coordinators in Japan, those in Europe obtain higher education, receive more training, and are more "ambitious". Therefore, when assigned a job with heavier responsibilities, the European coordinators are better motivated, which leads to higher job satisfaction. The above findings support Hypothesis 1.

Insert Table 3 about here

Hypothesis 2: The job characteristics of European in-hospital coordinators are associated with high levels of skill variety, task identity, task significance, autonomy, and feedback, and these lead to high performance.

As shown in Table 4, the level of each of the five job core dimensions had higher statistical significance in Europeans. The Motivating Potential Score (MPS) was calculated using the formula $MPS = (V + I + S)/3 \times A \times F$, where V is skill variety, I is task integrity, S is task significance, A is autonomy, and F is feedback[8], and the scores of Japan and Europe were compared. The MPS was significantly ($p < 0.001$, t-test) higher in the European coordinators (Table 5). These results indicated that the coordinators in Europe were assigned jobs with high job core dimensions and were driven by strong intrinsic motivation, which resulted in high performance. Hypothesis 2 was thus supported.

Insert Table 4 about here
---

[8] Hackman, J. R. and Oldham, G. R., (1980), p. 90

Insert Table 5 about here

Hypothesis 3: European in-hospital coordinators take pride in their work, which leads to job satisfaction and high performance.

The levels of pride in one's job in high-performing Europe and in low-performing Japan are as shown in Table 6. In Europe, 97.7% of the respondents replied that they took pride in their work, whereas 37.5% of the respondents in Japan replied the same. The Europeans' sense of pride in their work was significantly ($p < 0.001$, t-test) higher. A regression analysis was then performed with pride in one's work as the independent variable and job satisfaction as the dependent variable. A positive correlation was detected ($p < 0.01$). This result shows that greater pride was associated with higher job satisfaction.

Earlier research indicated that favorable social evaluation and recognition brought pride in one's work. This led to a comparison of the social recognition levels of Japanese and European coordinators. The related question is shown in Table 1. While 76.7% of the European respondents answered that the in-hospital coordinator job was recognized by society, only 11.0% of the Japanese respondents replied similarly, showing a significantly ($p < 0.01$, t-test) higher level of recognition in Europe. Additionally, the interviews revealed that to foster pride in in-hospital coordinators, it was important to improve the recognition of their role inside and outside hospitals through education and enlightenment activities in their hospital and community, by engaging with the media, and by feeling appreciated by hospital directors and other medical staff, including the transplant team. It was also shown that such opportunities were more abundant in Europe. Given these results, Hypothesis 3 was supported.

Insert Table 6 about here

Hypothesis 4: European in-hospital coordinators perform their role with professionalism, which leads to job satisfaction and high performance

Table 7 summarizes the comparison of the levels of professionalism in high-performing Europe and low-performing Japan. Compared to the result of 100% in Europe, 13.9% answered in Japan that they conducted their work with professionalism, demonstrating a significantly ($p < 0.001$, t-test) higher level of professionalism in Europe. A regression analysis conducted with professionalism as the independent variable and job satisfaction as the dependent variable demonstrated a positive correlation ($p < 0.05$) between the two variables, showing that higher levels of professionalism were associated with higher job satisfaction.

In the interviews, a concrete image of a professional in-hospital coordinator was presented as a "highly educated and trained individual who makes contributions in the processes of conducting studies and preparing research papers, and who determines the standard protocols for the organ donation process." This indicated that to foster professionalism in coordinators, it was essential to provide them with systematic education and training and introduce them to the qualification system.

In Spain, the University of Barcelona, which has developed transplant procurement management training programs, offers five face-to-face training courses and four e-learning courses ranging from a one-day introductory course to an advanced (five-day practical approach) course. With regard to the face-to-face training, 90 courses had been offered as of 2007, with 5,240 participants from across the world, leading to the training program's provision of a global major in coordinator education. The university also offers well-developed programs for medical

staff besides coordinators who are involved in organ donation. The Organizacion Nacional de Transplantes (ONT) headquarters allocates an annual budget of 390,000 US dollars to educate the nation[9]. In Northern and Central Europe, it is common for nurses to become coordinators after earning a master's degree. To acquire the requisite expertise and skills, they further undergo special training in emergency and operating rooms, and regularly make oral presentations at academic conferences or publish research papers. As a result, coordinators have received recognition as professionals and have earned respect in the medical field.

Regarding the qualification system, the European Transplant Coordinators Organization (ETCO) established the European Certification System in 2001 to demonstrate an achieved level of competence in the field of transplant coordination. Demonstrating the required experience and passing the examination allow the individual to attach the credential designation of "Certified European Transplant Coordinator (CETC)" to his or her name. In the U.S., the North American Transplant Coordinator Organization (NATCO) provides the world's highest level of certification. The interviews revealed that certification brought pride, motivation, and high performance to coordinators because they perceived certification as assurance of professional-level quality in their service. Therefore, these results support Hypothesis 4.

Insert Table 7 about here

Europe-Japan Comparison of the Job Content of the In-Hospital Coordinator

The in-hospital coordinator's job in Europe was shown to be associated with greater skill variety, task integrity, task significance, autonomy, and feedback. Additionally, a comparison of

[9] Uryuhara Y. (2004), p. 159

the specific content of the job revealed significant differences between Europe and Japan in the percentage of coordinators that is actually assigned to each task, as shown in Table 8.

The interview outcomes indicated that the specific job content was strongly related to job core dimensions, and that the job content itself led to motivation (Figure 4). Coordinators in Japan are merely designated the abstract role of "promoting the medical practice of transplantation," which lacks the specific characteristics required of the coordinator or job descriptions. Therefore, the in-hospital coordinators do not know what they are expected to do or what their role is. On the other hand, in Europe, the presence of specific job descriptions and recognition by the director of the institution and other staff allow the coordinators to engage in their jobs in cooperation with other staff, and this helps the coordinators realize their responsibilities and feel motivated to do their job.

The above findings show that in Japan, redesigning the coordinator's job, defining job descriptions, and ensuring that the relevant personnel and general public are informed about the coordinator's job can motivate the coordinators.

Insert Table 8 about here

Insert Figure 4 about here

DISCUSSION

In Japan, the organ donation shortage is attributed to various factors including cultural and legal aspects. Our study involved analyses that focused on the status of organ donor hospitals, since the root of the problems related to organ donation has been traced to hospitals. Legal reforms and increased awareness among the enlightened public alone will not persuade a greater

number of potential organ donors to come forth unless the situation in the medical setting where organ donation takes place is improved. In terms of the intrinsic motivation of in-hospital coordinators, who play a major role in the practice of organ donation, our analysis suggests that the organ donation shortage in Japan is attributable to the situation in which poorly motivated in-hospital coordinators are engaged in their work in the environment where they are assigned tasks of low task identity, low task significance, low autonomy, and low feedback, without social recognition and satisfactory education and training, which deprives them of job satisfaction, pride in their work, and professionalism. This finding indicates the possibility that coordinators may be motivated if their job profile is redefined, they can obtain systematic education and training, be recognized by healthcare professionals and society, and other appropriate measures are taken to improve the process by which potential donors become actual donors, and in turn, this may increase the number of organ donations in Japan.

In this study, the states of in-hospital coordinators in Japan and Europe were compared. American coordinators were not included because Japan is deemed to have a system similar to that of Europe, where the personnel in charge of the entire organ donation process work at donor hospitals. However, in the U.S., the Organ Procurement Organization (OPO), an independent organization that operates outside of donor hospitals, is engaged in organ donation[10].

CONCLUSION

The principle contribution of this study is that it demonstrated that Hackman and Oldham's established Job Characteristics Model can be applied to the profession of in-hospital coordinator—a medical profession that is based on a new concept—by extending the scope of the application of this model. Secondly, we showed that greater professionalism was associated

[10] Manyalich M., Valero R., Paredes D., and Paez G. (2007), p. 18

with higher job satisfaction and performance for an individual who belongs to a group of professionals.

This research also contributed to the medical practice of organ transplantation in that it was the first one to be conducted on the organ donation shortage in Japan from the perspective of in-hospital coordinators' intrinsic motivation, including job characteristics, thereby presenting a new aspect of the issue of organ donation. Additionally, the research findings have led to the following five specific proposals regarding in-hospital coordinators and encouragement for organ donation in Japan: (1) To define the mission and the goal of the in-hospital coordinator, to redesign the coordinator's job, and to provide clear job descriptions in order to inform the other staff and the public about the job; (2) to create a precise profile of the coordinator and to appoint personnel that satisfy the requirements; (3) to allow coordinators to participate proactively in education and enlightenment activities inside and outside hospitals in order to provide them with opportunities to receive recognition and acknowledgment; (4) to develop systematic education and training programs for in-hospital coordinators and to support them at the national level; and (5) to introduce a coordinator qualification system.

The remaining areas of further research include the organizational structure of nationwide support for in-hospital coordinators. Pierce and Dunham (1976) proposed that individual responses to job characteristics might be advanced by relating the participants' responses to properties of macro organization that encompass jobs and individuals. Oldham and Hackman (1981) hypothesized that the properties of organizational structure (*i.e.*, size, number of hierarchical levels, formulation, and centralization) can determine job characteristics to a certain degree. In the 1980s, in order to solve the same problems that Japan is currently facing, Spain not only created the in-hospital coordinator job profile but also established a national network to

support these professionals. In the interviews conducted as part of this research, the absence of a well-organized system that supports in-hospital coordinators in Japan was highlighted. Investigating the proper function of organ donation staff-supporting organizations based on existing organizational theories is another important research topic that should be explored to solve the organ shortage issue in Japan.

[2010.2.22 956]

REFERENCES

Alderfer C. P. 1972. ***Existence, relation, and growth: Human needs in organizational settings.*** New York, NY: Free.

Cruess R. & Cruess S. 2006. Teaching professionalism: General principles. ***Medical Teacher,*** 28(3): 205-208.

Deci E. L. 1975. ***Intrinsic motivation.*** New York, NY: Plenum.

Fujita H. 2000. Theory of motivation by the sense of pride (in Japanese). ***Japanese Organizational Science,*** 33(4): 59-75.

Hackman J. R. & Oldham G. R. 1975. Development of the job diagnostic survey. ***Journal of Applied Psychology,*** 60(2): 159-170.

Hackman J. R. & Oldham G. R. 1976. Motivation through the design of work: Test of a theory. ***Organizational Behavior and Human Performance,*** 16(2): 250-279.

Hackman J. R. & Oldham G. R. 1980. ***Work redesign.*** Reading, MA: Addison-Wesley.

Herzberg F. 1966. ***Work and the nature of man.*** Cleveland, OH: World.

Manyalich M., Valero R., Paredes D. & Paez G. 2007. Transplant procurement management: Transplant coordination organization model for the generation of donors. In TPM-Fundacio-IL3 (Ed.) ***Transplant Coordination Manual:*** 9-25. Barcelona Spain: Limpergraf S.L.

Maslow A. H. 1954. ***Motivation and personality.*** New York: Harper & Row.

Oldham G. R. & Hackman J. R. 1981. Relationship between organizational structure and employee reaction: Comparing alternative frameworks. ***Administrative Science Quarterly,*** 26: 66-83.

Pierce J. L. & Dunham R. B. 1976. Task design: A literature review. ***Academy of Management Review,*** 1(4): 83-97.

Roels L., Kalo Z., Boesebeck D., Whiting J. & Wight C. 2003. Cost-benefit approach in evaluating investment into donor action: The German case. ***Transplant International,*** 16(5): 321-326.

Tao M. 1987. ***Innovation of work (in Japanese).*** Tokyo, Japan: Hakuto-Shobo.

Uryuhara Y. 2004. Approaches to solve organ shortage in European countries (in Japanese). ***Japanese Journal of Transplantation,*** 39(2): 145-162.

Whiting J. F., Kiberd B., Zoltan K., Keown P., Roels L. & Kjerulf M. 2004. Cost-effectiveness of organ donation: Evaluating investment into donor action and other donor initiatives. ***American Journal of Transplantation,*** 4(4): 569-573.

TABLE 1

Dimensions and Questions

Category	Dimension	No	Question
job satisfaction	job satisfaction	8	I am satisfied with my job as an in-hospital coordinator.
motivators based on JDS model	skill variety	1	The job of an in-hospital coordinator requires various types of skills and know-how.
		2	The job of an in-hospital coordinator is very diversified every day.
	task identity	7	I can accomplish my job as an in-hospital coordinator under my own responsibility.
	task significance	3	I think I can help families handle grief through my work as in-hospital coordinator.
		4	The job of an in-hospital coordinator contributes to saving lives.
	autonomy	5	I can change the procedure and method of work of an in-hospital coordinator at my own discretion.
	feedback	6	I am able to find out whether my work as an in-hospital coordinator is helpful for patients and their family.
motivators	pride	9	I am proud of my job as an in-hospital coordinator.
	social recognition	20	I think the job of an in-hospital coordinator is socially acknowledged.
	professionalism	10	I am carrying out my work as an in-hospital coordinator with all the professionalism required for this job.
	remuneration	18	I am in a higher salary scale than my colleagues who are not involved in the donation process, irrespective of my donation activities.
	remuneration requirement	19	I think it is necessary to provide additional remuneration to in-hospital coordinators for their role.
job contents	coverage of process	11	As an in-hospital coordinator, I am involved in the whole process of organ donation.
	education to medical staff	12	I provide the medical staff of my institute with education and training on organ donation.
	education to general public	13	As an in-hospital coordinator, I provide the general public with information and education about organ donation or transplantation.
	R&D	14	I am involved in research to develop a better methodology for further improvement of the process of organ donation in my institute.
	resource management	15	As an in-hospital coordinator, I am engaged in the management of resources (such as financial budget) related to organ donation.
	media management	16	As an in-hospital coordinator, I am dealing with the mass media and their coverage of the medical practice of organ transplantation.
	reporting system	17	We (coordinator team) are reporting the outcome of our work as an in-hospital coordinators directly to the director of our institute.

TABLE 2

Europe-Japan Comparison of Respondents' Profiles

Items	Category	p-value of χ^2 Test
Age	20-29, 30-39, 40-49, 50-59, 60-69	0.048*
Gender	Male, female	0.651
Professional category	Medical doctor, nurse, clinical laboratory technician, pharmacist, administrative staff, others	$p < 0.001$
Field of specialty	Anesthesia, ICU/emergency, neurosurgery, urology, general surgery, nephrology, general internal medicine, others, no specialty	$p < 0.001$
Experience as a medical professional	0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39 years	0.667
Experience as an in-hospital coordinator	0-1, 1-2, 3-4, 5-9, 10-14, 15-19, 20- years	$p < 0.001$
Percentage of the work as an in-hospital coordinator out of total job	0-24, 25-49, 50-74, 75-100 %	$p < 0.001$
Appointed a formal in-hospital coordinator	Yes, no	0.217
Organ transplant program	Yes, no	$p < 0.001$

* $p < 0.05$

TABLE 3

Europe-Japan Comparison of Job Satisfaction

Q8: I am satisfied with my job as an in-hospital coordinator

		5.Strongly agree	4.Somewhat agree	3.Neither agree nor disagree	2.Somewhat disagree	1.Strongly disagree	Total	Mean	S.D.
Europe	N	24	17	0	2	0	43	4.47	0.73
	%	55.8%	39.5%	0.0%	4.7%	0.0%	100%		
Japan	N	0	6	49	13	4	72	2.79	0.67
	%	0.0%	8.3%	68.1%	18.1%	5.6%	100%		

Mean Difference: 1.68, t-value: 12.20, p-value: $p < 0.001$

TABLE 4

Europe-Japan Comparison of Job Core Dimensions

Dimension	Question	Mean		t-value	p-value
		Europe	Japan		
skill variety	The job of an in-hospital coordinator requires various types of skills and know-how.	4.95	4.08	8.08	p <0.001
	The job of an in-hospital coordinator is very diversified every day.	4.4	2.96	8.07	p < 0.001
task identity	I can accomplish my job as an in-hospital coordinator under my own responsibility.	4.16	2.69	8.37	p < 0.001
task significance	I think I can help families handle grief through my work as an in-hospital coordinator.	4.44	3.33	8.66	p < 0.001
	The job of an in-hospital coordinator contributes to saving lives.	4.53	3.57	6.17	p < 0.001
autonomy	I can change the procedure and method of work of an in-hospital coordinator at my own discretion.	3.42	2.55	3.76	p < 0.001
feedback	I am able to find out whether my work as an in-hospital coordinator is helpful for patients and their family.	4.33	3.10	7.33	p < 0.001

TABLE 5

Europe-Japan Comparison of MPS

	N	Min. - Max.	Mean	S.D.	Mean difference	t-value	p-value
Europe	43	15.3 - 120.8	68.2	33.3	42.7	7.90	$p < 0.001$
Japan	72	1.0 - 73.3	25.5	14.2			

TABLE 6

Europe-Japan Comparison of Pride in One's Work

Q9: I am proud of my job as an in-hospital coordinator

		5.Strongly agree	4.Somewhat agree	3.Neither agree nor disagree	2.Somewhat disagree	1.Strongly disagree	Total	Mean	S.D.
Europe	N	23	19	1	0	0	43	4.51	0.54
	%	53.5%	44.2%	2.3%	0.0%	0.0%	100%		
Japan	N	2	25	34	8	3	72	3.21	0.83
	%	2.8%	34.7%	47.2%	11.1%	4.2%	100%		

Mean Difference: 1.30, t-value: 10.05, p-value: $p < 0.001$

TABLE 7

Europe-Japan Comparison of Professionalism

Q10: I am carrying out my work as an in-hospital coordinator with all the professionalism required for this job.

		5.Strongly agree	4.Somewhat agree	3.Neither agree nor disagree	2.Somewhat disagree	1.Strongly disagree	Total	Mean	S.D.
Europe	N	35	8	0	0	0	43	4.81	0.39
	%	81.4%	18.6%	0.0%	0.0%	0.0%	100%		
Japan	N	0	10	31	24	7	72	2.61	0.84
	%	0.0%	13.9%	43.1%	33.3%	9.7%	100%		

Mean Difference: 2.20, t-value: 18.89, p-value: $p < 0.001$

TABLE 8

Europe-Japan Comparison of Job Contents

Dimension	Question	Mean		t-value	p-value
		Europe	Japan		
coverage of process	As an in-hospital coordinator, I am involved in the whole process of organ donation.	4.60	2.08	14.33	$p < 0.001$
education to medical staff	I provide the medical staff of my institute with education and training on organ donation.	4.44	2.05	13.27	$p < 0.001$
education to general public	As an in-hospital coordinator, I provide the general public with information and education about organ donation or transplantation.	4.28	2.13	9.85	$p < 0.001$
R&D	I am involved in research to develop a better methodology for further improvement of the process of organ donation in my institute.	3.79	1.92	7.72	$p < 0.001$
resource management	As an in-hospital coordinator, I am engaged in the management of resources (such as financial budget) related to organ donation.	2.88	1.49	5.63	$p < 0.001$
media management	As an in-hospital coordinator, I am dealing with the mass media and their coverage of the medical practice of organ transplantation.	3.76	1.45	10.10	$p < 0.001$
reporting system	We (coordinator team) are reporting the outcome of our work as in-hospital coordinators directly to the director of our institute.	4.37	2.03	10.22	$p < 0.001$

FIGURE 1

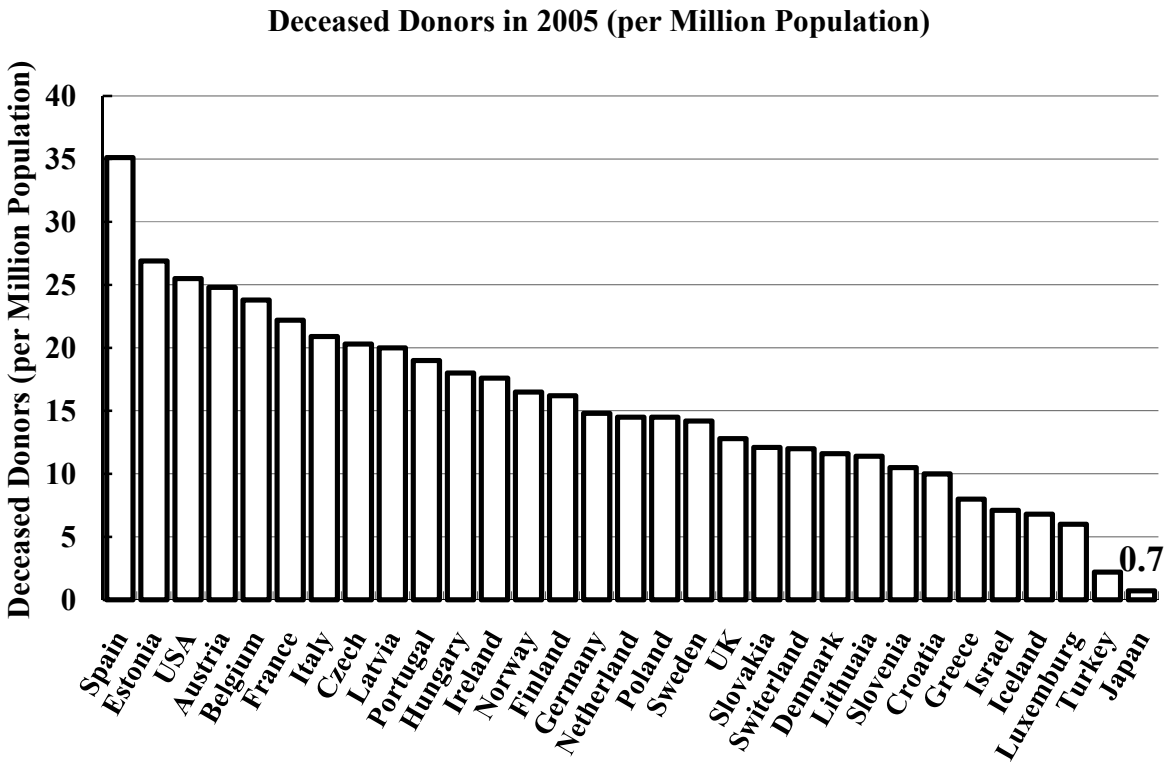
Deceased Donors in 2005 (per Million Population)
Deceased Donors (per Million Population)
40
35
30
25
20
15
10
5
0
0.7
Spain
Estonia
USA
Austria
Belgium
France
Italy
Czech
Latvia
Portugal
Hungary
Ireland
Norway
Finland
Germany
Netherland
Poland
Sweden
UK
Slovakia
Switerland
Denmark
Lithuaia
Slovenia
Croatia
Greece
Israel
Iceland
Luxemburg
Turkey
Japan

FIGURE 2

Model of Organ Donation Process from a Potential Donor to an Actual Donor

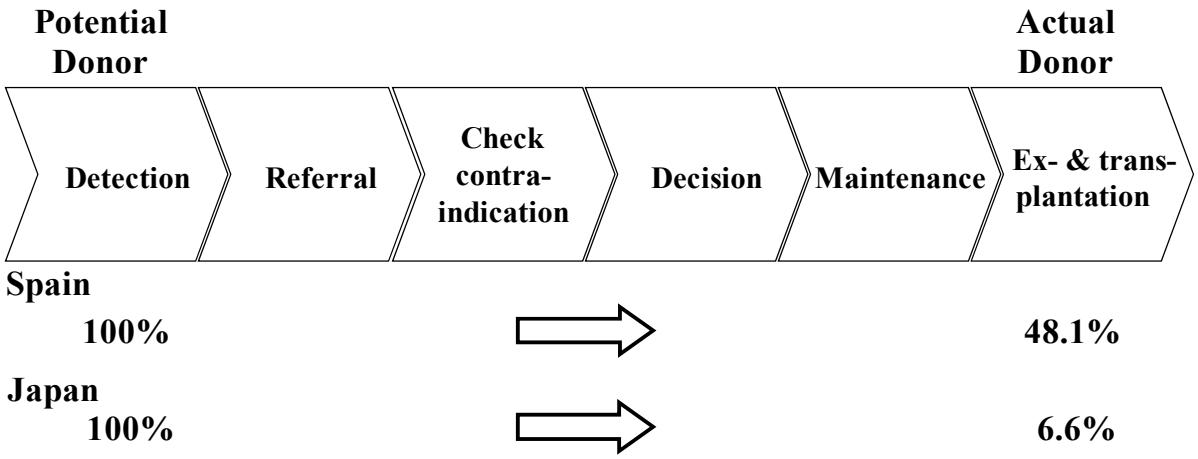

FIGURE 3

Conceptual Model

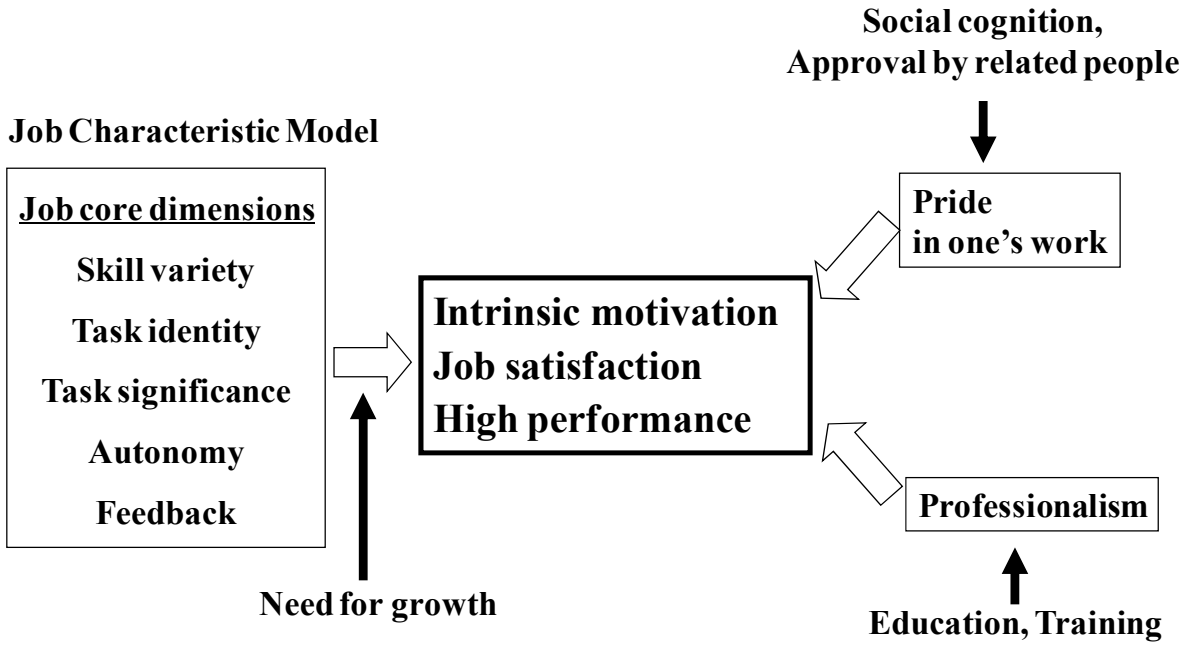

FIGURE 4

The Relationship between Job Contents in Spain and Job Core Dimensions