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ROLE OF SPECIALIZED TRAINING PROGRAMS IN ORGAN DONATION: PEDAGOGICAL APPROACH

PhD Thesis

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In the memory of my beloved parents, who are always with me, beyond time and space

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Abbreviations

ACCORD: Achieving Comprehensive Coordination in ORgan Donation throughout the European Union
ACTOR: Study on the set-up of organ donation and transplantation in the EU Member States, uptake and impact of the EU Action Plan on Organ Donation and Transplantation
ADDIE (instructional design): analysis, design, development, implementation and evaluation
Alliance-O: European Group for Coordination of Research Programmes on Organ Donation and Transplantation
AMA: The American Medical Association
ASSURE (instructional design): analyse learners and know your audience; state objectives; select and use instructional methods, media, and materials; require learner participation and last but not least evaluate and revise
BD: Brain death
BL: blended
CE: Council of Europe
COORENOR: COORdinating a European initiative among National organizations for ORgan transplantation
4C/ID: Four Component Instructional Design Model
CIP: Continuous Improvement Program
DBD: Donors after Brain Death
DCD: Donors after Circulatory Death
DOPKI: Improving the Knowledge and Practices in Organ Donation
D&T: donation and transplantation
EDD: European Donation Day
EFRETOS: European Framework for the Evaluation of Organ Transplants
ELIPSY: Euro Living Donor Psychosocial Follow Up
ELPAT: 2nd Conference on Organ Transplantation: Ethical, Legal and Psychosocial Aspects. Expanding the European Platform
EOD: Essentials in Organ Donation
EQSTB: European Quality System for Tissue Banking
ETPOD: European Training Program on Organ Donation
EULID: Euro Living Donor

EULOD: Living Organ Donation in Europe

FOEDUS: Facilitating Exchange of Organs Donated in EU MS

F2F: face-to-face

HNBTS: Hungarian National Blood Transfusion Service

ICU: Intensive Care Unit

IL3: Institute for Lifelong Learning

IPE: inter-professional education

IPC: inter-professional collaboration

IRB: Institutional review boards

MD: medical doctors

MODE: Mutual Organ Donation and Transplantation Exchanges

OCO: Organ Coordination Office

ODEQUS: Organ Donation European Quality System

ODTaSE: Organ Donation Training and Systems Evaluation

OL: online

ONT: Organización Nacional de Trasplantes (Spanish National Transplant Organization)

PMP: Per million populations

PU: Purdue University

RQ1: research questions 1

RQ2: research questions 2

RN: registered nurses

S: survey

TA: target areas

TPM: Transplant Procurement Management

TTS: The Transplantation Society

UB: University of Barcelona

WG: working groups

WHO: World Health Organization

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Preface

As the European Directorate for the Quality of Medicines & Healthcare (2013) states, organ transplantation is an efficient life-saving treatment for end-stage organ failure and offers recipients major improvements in their quality of life. Over 1 million people have benefitted worldwide from successful organ transplantation and a number of transplant patients have survived for over 25 years. Moreover, organ transplantation is the most cost-effective treatment for end-stage renal failure.

I chose this topic for research for several reasons.

I came to learn about this field due to illness in my family. It happened more than 8 years ago when I chose to become a living liver donor. My mother was suffering from cirrhosis, as a result of hepatitis C, and her condition was worsening rapidly. There was no time to waste. I offered to be a living liver donor. I spent months after months in hospital before and after donation, and I discovered the two sides of the coin: donation and transplantation. I saw successfully transplanted patients coming back for regular check-ups, recipients who did not survive the surgery or died shortly after, and also watched people dying in the Intensive Care Unit while waiting for an organ. My life changed irreversibly.

At the same time I started collaborating with the Spanish team from Transplant Procurement Management and the University of Barcelona, in the framework of a European project that aimed at designing, developing and implementing efficient training programs in organ donation. This project attracted me to this world, which fascinated and saddened me deeply at the same time. When death takes its toll, the gift of life keeps hope alive.

As instructional designer and educational expert directly involved in developing, implementing and coordinating training programs in organ and tissue donation, I became interested in the impact of these educational interventions.

It is essential to provide reliable knowledge, skills and competences to efficiently coordinate the whole process of organ and tissue donation. Apart from thorough

medical knowledge, organization and communication skills at various levels are required such as:

- ✓ hospital units where potential donors may be identified
- ✓ relatives of the potential donor
- ✓ transplant teams
- ✓ organ allocation organizations
- ✓ governmental bodies
- ✓ society

On one hand, communication skills are essential to ensure a smooth internal communication among the different units, teams, hospitals and allocation organizations.

On the other hand, when breaking bad news to relatives, healthcare professionals need strong communication skills in order to know how to help families with their grieving process. Moreover, transplant donor coordinators must be able to communicate effectively and sensitively when requesting donation from bereaved families. Thus, specialized training needs to be delivered to ensure that healthcare professionals are well prepared for such a complex job.

Many questions arose in my head. What educational strategies are used? Is education and training impacting positively the activity of organ and tissue donation? How do beneficiaries perceive these training programs?

In an attempt to get some evidence-based answers to my questions, I got involved in two different but complementary studies, which measured the impact of training programs on organ donation as well as their perceived benefits. On the basis of the findings, further improvements will be recommended to ensure their efficiency.

Chapter 1. Introduction

1. Organ Transplantation: definition and history

MedlinePlus defines organ transplantation as the replacement of an organ that failed with a healthy organ from a compatible donor, deceased or living.

First, a short overview of organ transplantation will be given as detailed by history channels (http://www.history.com/news/organ-transplants-a-brief-history). The first skin transplant dates back to 800 B.C. when Indian physicians performed it to repair wounds and burns. Later on, in 16th Century, the Italian surgeon Gasparo Tagliacozzi, also known as the father of plastic surgery, used his patients' own skin to reconstruct their noses and ears. He found that skin from a different donor usually caused the procedure to fail. This aspect was identified by his successors as transplant rejection, which occurs when the immune system of a transplant recipient distinguishes the foreign organ or tissue and attempts to destroy it just as it does when identifying any infective organisms entering the body. In the early 1900s European physicians tried to save patients suffering from renal failure by transplanting kidneys from various animals but none of them survived for more than a few days. In 1905, the first corneal transplant was successfully performed by the Austrian ophthalmologist Eduard Zirm, in a patient who had been blinded in an accident.

In 1912, the French surgeon, Alexis Carrell was awarded the Nobel Prize for his work in transplantation (Nobelprize.org). He conducted successful kidney transplant surgeries on dogs and later on he developed with aviator Charles Lindbergh a device to maintain organ viability outside the body, a precursor to the artificial heart.

In 1936 the Ukrainian doctor Yu Yu Voronoy performed the first human kidney transplantation using an organ from a deceased donor. The surgery was not successful due to rejection. After a series of attempts of kidney grafts conducted by a team of doctors at Boston's Peter Bent Brigham Hospital in the late 1940s and early 1950s, the first successful kidney transplantation was performed in 1954 when a kidney of 23-year-old patient was transplanted into his identical twin brother.

In 1960 Sir Frank Macfarlane Burnet and Peter Brian Medawar received the Nobel Prize "*for discovery of acquired immunological tolerance*" (Nobelprize.org). Soon

after, immunosuppressant drugs were produced to prevent rejection when donor and recipient were not genetically identical. The same year, the first successful lung, pancreas and liver transplants took place. In 1967, the South African surgeon Christian Barnard performed a successful heart transplantation. The patient died 18 days later. Over a hundred transplantations were performed in 1968–1969, but almost all the patients died within 60 days.

By 1984 two-third of heart transplant patients survived for five years or longer. It was the breakthrough in the immunosuppressive medication with Cyclosporine-A that opened the door to real long-term success. Even though the first heart-lung transplant was performed in 1968, the first one which proved successful took place at Stanford University Hospital in 1981.

Due to ongoing improvements in organ preservation solutions and techniques, as well as immunosuppression, intraoperative management and post-operative care advancements, organ transplantation has become by now a widely practiced effective therapy for end-stage organ failures. In 2014 a total of 119873 of solid organs were transplanted (79948 kidney transplants, 26151 liver transplants, 6542 heart transplants, 4689 lung transplants, 2328 pancreas transplants and 215 small bowel transplants worldwide), out of which more than 25 % took place in the European Union (Council of Europe & Organización Nacional de Trasplantes, 2016).

The transplantation activity would not have existed without organ donation. A total of 27397 people donated their organs after death in 2014. These figures were further reinforced by thousands of living donors worldwide.

2. What is human organ donation?

Donation, as defined by WHO (2009) represents "donating human cells, tissues or organs intended for human applications".

According to Encyclopædia Britannica (www.britannica.com), organ donation is "the act of giving one or more organs (or parts thereof), without compensation, for transplantation into someone else".

No matter how we define it, organ donation refers to the same act, that of the surgical process of recovering one or more organs from a donor (living or deceased) for transplantation into another person suffering from organ failure due to illness or injury.

3. Types of donors

People can donate both organs and tissues. The organs that can be donated include heart, lungs, liver, kidneys, pancreas and small bowels. Tissues that can be donated include corneas, heart valves, skin, bones, and tendons. There are two types of donors: living and deceased.

3.1 Living donors

Living donors are living human beings from whom cells, tissues or organs are removed for the purpose of transplantation. They may be divided into two main categories according to the type of relationship with the recipient:

- Related:
  a. Genetically related:
     - ✓ 1st degree genetic relative: parent, sibling, offspring
     - ✓ 2nd degree genetic relative: grandparent, grandchild, aunt, uncle, niece, and nephew
     - ✓ other than 1st or 2nd degree genetically related, for example cousin
  b. Emotionally related: spouse (if not genetically related); in-laws, adopted, friends
- Unrelated: not genetically or emotionally related

Nowadays in some countries living donation is the only source of organs and represents a minor source for others (Annex 1). Such differences could be explained by different legal, cultural, political, technical or logistical conditions present in every country.

At national/regional level donation activity is normally measured as a ratio, in donors per million populations (donors /pmp).

In all cases it is mandatory to follow all the legal and ethical requirements that exist in a country, and it is the responsibility of the transplant donor coordinator to meet them.

The global concern is to avoid "commercialization" in living organ donation procedures. In this regard, the main recommendations and regulations in the donation and transplantation field as well as ethical issues will be addressed later on in this chapter.

3.2 Deceased donors

Deceased donors are human beings declared, by established medical criteria, to be dead and from whom cells, tissues or organs are recovered for the purpose of transplantation (Annex 2).

Deceased donors consist of two different categories according to the diagnosis criteria used (cardiorespiratory or neurological):

3.2.1 Donors after Brain Death (DBD)

DBDs are donors who were declared dead and diagnosed by means of neurological criteria. The percentage of causes leading to brain death (cerebrovascular accident both ischemic and haemorrhagic, brain trauma, anoxic encephalopathy, primary brain tumour) may vary among countries depending mostly on the demographics, the rate of traffic and/or cerebrovascular accidents and technological advances as well as health care facilities.

In Spain, brain death incidence represents around 2.5 % of the total number of hospital deaths, and 13% of all Intensive Care Unit (ICU) deaths. Actually 50% of brain death patients may become a donor. In comparison with other countries, in Spain brain dead donors have been around 95% of the total number of donors, which warrant the use of organs and tissues for transplantation (Organización Nacional de Trasplantes, 2014).

3.2.2 Donors after Circulatory Death (DCD)

DCDs are donors who were declared dead and diagnosed by means of cardio-pulmonary criteria. DCD programs vary from country to country. While UK had in 2014 a DCD rate of 8 pmp (of total donation rate of 20.6 pmp), followed by Netherlands with 7.9 pmp (of total donation rate of 16.8pmp) and Belgium with 7.5 pmp (of total donation rate of 26.9 pmp), many other countries have no DCD programs at all (Council of Europe & Organización Nacional de Trasplantes, 2015). The implementation of such programs requires a well-organized structure and effective coordination of all actors involved in the process. Once death is certified, preservation techniques must be initiated or rapid organ recovery must be done to avoid warm ischemia damage.

Besides increasing deceased donor pool, organs recovered from DCD have shown promising outcomes comparable with grafts from conventional DBD (Saidi, 2007; Domínguez-Gil, Haase-Kromwijk, Van Leiden, et al., 2011).

Both living and deceased donors may donate organs, tissues or both. The organ donation process is a multifaceted process in which many actors are involved with the sole purpose of recovering organs and tissues for donation. The **transplant donor coordinator** (or transplant procurement manager) must be aware of all types of organ donors and the differences that exist among them, and needs to assure that all the medico-legal and operational procedures are in compliance with the best medical knowledge as well as legal and ethical regulations of the given country.

Moreover, the transplant donor coordinator should take an active role in all the steps of the organ donation process (Fig 1), living or deceased, ensure safe tissue donation, provide training, participate in research activities, quality improvement programmes and donation related management (Manyalich, Valero, Paez, Balleste Delpierre & Sandiumenge, 2014).

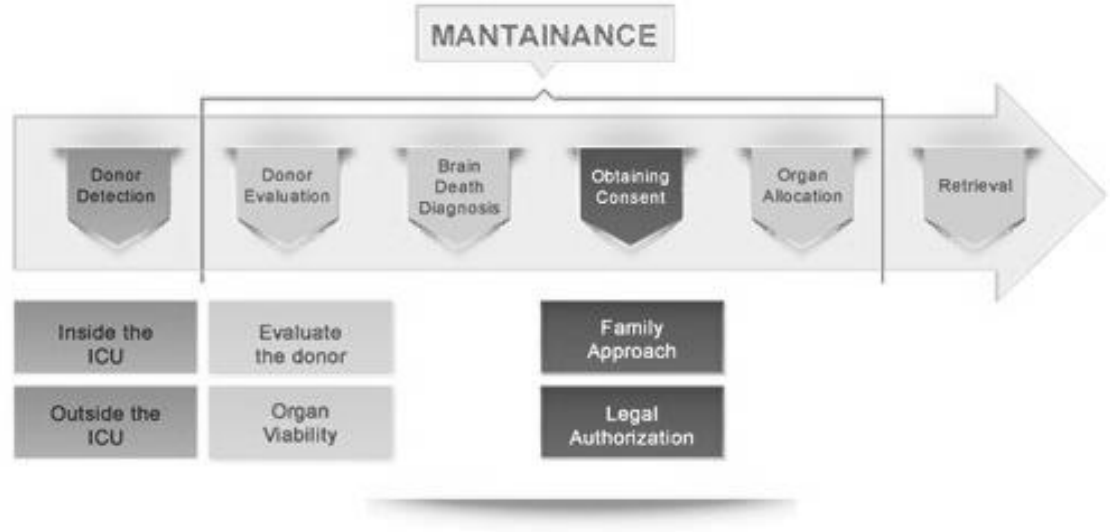


Figure 1. The organ recovery process in donors in whom death by neurological criteria was established (source: TPM, Professional Training in Organ Donation online course, Topic 1: Donor detection System)

4. Optimizing donation potential

According to the Recent Facts and Figures reported by the European Commission (2014) during the Journalist Workshop in Brussels, a total of over 63.000 patients were placed on organs' waiting list in the European Union by the end of 2013, with an estimated number of 4.100 that died while waiting (an average of 11 patients per day). Long periods on the waiting lists for organs result in a deterioration of the patient's condition or even death before surgery is possible. The increased incidence of diabetes and high blood pressure as well as the ageing population in Europe (World Health Organization. Data and statistics) leads to an increased demand of transplants. Moreover, a large variability between the different European member states in the availability of transplantable organs is reported (from 4.5 donors pmp in Greece to 35.7 in Spain in 2014) (Council of Europe and Organización Nacional de Trasplantes, 2015).

Organ scarcity (Abouna, 2008; Uryuhara, Hasegawa, Takahashi, et al., 2004; Roels, Cohen, Gachet & Miranda, 2002) is the major limiting factor for the further development of transplant programs worldwide. Participants to the third WHO Global Consultation on Organ Donation and Transplantation (WHO Global Consultation, 2011) 'urged the WHO, its Member States and professionals in the field to regard organ donation and transplantation as part of every nation's responsibility to meet the health needs of its population in a comprehensive manner and address the conditions leading to transplantation from prevention to treatment'. The goal is to achieve self-sufficiency in organ donation and transplantation.

Optimal donation rate proposed is 50 donors pmp, although this has only been reached in some areas during determined periods of time. Spain and Croatia are the countries with the higher annual donation rates. In most western countries, the absolute number of donors, as well as the pmp has not significantly varied in the last years. The reasons for donor rate stabilization observed during the last years may include a decrease on the incidence of catastrophic brain injury as a result of public health initiatives that reduced the number of motor vehicle accidents, advances in the neuro-critical care management (many patients no longer progress to brain death), and changes in the demographics of the general population. However, the main cause of organ shortage seems to be not the lack

of potential donors, but rather a failure to identify them and turn them into actual donors.

Every country/area or hospital should identify the main gaps and pitfalls along the donation process that may hinder the generation of donors. Once the problems are identified initiatives to solve them or minimize their incidence should be promoted by national health authorities along with health professionals directly involved in this field (Matesanz, 2011).

There are several factors that can influence the magnitude and type of donor activity of a country or region (Van Gelder et al., 2008).

- **Demography**: Countries with an aged population, such as western countries, have older donors than those countries with younger populations (such Asian countries). These age differences are explained by and are also the consequence of other epidemiological data (cerebral bleedings, tumour deaths, etc.) that determine the donor profiles of every country (Matesanz, 2004).
- **Access to the Health System**: Countries with Public National Health Systems that provide a non-fragmented coverage to the population are more prone to develop integrated and efficient donation and transplantation programs. Other factors such as the number of ICU beds per million population, the ratio of ICU beds / total acute beds and the number of doctors and nurses available may explain the differences from country to country in their capability of detecting potential donors and maintaining them adequately until brain death diagnosis and organ procurement has been completed (Matesanz, 2003).
- **Legal background** (Mossialos, Costa-Font & Rudisill, 2008): Countries with solid legal frameworks including concepts such as definition of brain death, organ recovery after obtaining the consent of the family, and no compensation either for donation or for grafted organs are the ones able to develop a consistent donation and transplant programs. In almost all European countries the consent for an organ donation from a deceased donor is embedded in a binding law. There are four forms of consent (European Commission, 2003):
  - ✓ Agreement of close relatives required

- ✓ Presumed consent (some European countries presume the consent of the donor and those who object can opt out), but family consent is requested if the wishes of the deceased person are unknown
- ✓ Presumed consent, but family confirmation needed
- ✓ Presumed consent, no family agreement needed

Concerning living donation, in most of the European countries the consent of living donors is regulated by law. Informed consent is the communication process between a patient and doctor. In this process, a doctor provides information to a patient about a particular treatment or test in order for a patient to understand the risks and benefits of treatment and finally to decide whether or not to undergo such treatment or test (eMedicineHealth, 2006). In most of the European countries living donors have the right to withdraw their consent at any time. In most of the European countries minors or disabled people are excluded from donation by law. In other European countries legal authorization is given if they want to be an organ donor and if their parents or guardians agree to donation or if there is an emergency situation (European Commission, 2003).

- **Religion** (Bruzzone, 2008), cultural and social issues: The large majority of religions take a positive stance toward donation. Other factors such as the emotional response, the cultural values, and spiritual issues may be even more compelling to set a population attitude towards donation than religious beliefs (Irving, 2012).
- **Education and training**: Although multifactor approaches are needed to tackle the issue on different levels, besides social awareness (Matesanz & Miranda, 2002), mass media campaigns (Wakefield, Loken & Hornik, 2010), religion, ethics (Aulisio, Devita & Luebke, 2007) and legislative modifications, the advanced training of professionals active in organ donation (Paez, Valero & Manyalich, 2009; Matesanz & Dominguez, 2007), and their involvement in the implementation of proactive donor detection systems at hospital level (European Directorate for the Quality of Medicines & Healthcare 2013) is highlighted as a major factor by many national and international programs. The analysis of best practices shows that the presence of a trained transplant donor coordinator within every hospital (Salim, Berry, Ley et al. 2011) is one of the major key factors to maximize deceased donor potential and eventually increase donation rates.

5. Initiatives in the European Union

The European Union (European Commission, Directorate General for Health & Consumers. Health & Consumers Voice, 2009) undertook several initiatives in organ donation and transplantation (Annex 3) to support member states in their efforts to implement Directive 2010/53/EU and the Action Plan on organ donation and transplantation (Commission of the European Communities, 2008).

The initiatives addressed three different challenges in the European setting: increasing organ availability, improving quality and safety, and enhancing the accessibility of transplantation systems. Several projects have been funded under the Research or Health Programs run by the Executive Agency for Health and Consumers (2013).

6. Actions, recommendations and regulations

Major resolutions, recommendations, conventions, directives and further documents of main bodies such as World Health Organization (WHO), Council of Europe (CE) and European Union (EU) have emerged (Annex 4). Whereas Agreements and Conventions are binding on the states that ratify them, resolutions and recommendations are policy statements to governments proposing a common course of action to be followed.

7. Ethical issues

Ethical standards of all aspects related to the organ donation and transplantation process have to comply with the Oviedo Convention on Human Rights and Biomedicine (Council of Europe, 1997); the Additional Protocol on Transplantation of Organs and Tissues of Human Origin (Council of Europe, 2002); and Committee of Ministers Resolution (1978) 29 on harmonisation of legislation of member states regarding procurement and transplantation of human substances.

Other important guidelines are the WHO Guiding Principles on human cell, tissue and organ transplantation (World Health Organization, 2010), the Declaration of Istanbul on organ trafficking and transplant tourism (Steering Committee of the Istanbul Summit, 2008) and the European Directive 2010/53/EU on standards of

quality and safety of human organs intended for transplantation (European Parliament and Council of the European Union, 2010).
Any action in the field should be carried out in accordance with ethical standards (Annex 5).

8. Framework of organ donation in Hungary

Hungary occupies the low-lying areas of the Carpathian basin and represents 1% of the area of Europe. In 2013 the population of Hungary was of 9.955.000 inhabitants (http://www.who.int/countries/hun/en/) and approximately 1/3 of the population lives in the metropolitan area of the capital.
National legislation on organ donation and transplantation includes:

- ✓ Act CLIV of 1997 on Health, Chapter XI about Organ and Tissue Transplantation
- ✓ Decree 18/1998 (XII.27.) on the Details Performing Organ and Tissue Transplants and Storage Regulated Previously by Act CLIV of 1997 on Health in General
- ✓ Governmental Decree 287/2006 (XII. 23.) on Healthcare Services Performable Exclusively by Applying Preliminary Waiting Lists of Patients

National guidelines for clinical practice on organ donation:

- ✓ Hungarian National Blood Transfusion Service (HNBTS) - Organ Coordination Service: *Protocol of transplant coordination during the whole organ donation process - 2009*
- ✓ Hungarian Society for Anaesthesiology and Intensive Therapy, Organ Donation Expert Group: *Protocol of organ donation*

HNBTS was established in 2000, it consists of 5 regional and 18 local institutions and it is responsible to provide the health care service providers in Hungary with blood components. Within HNBTS, the Organ Coordination Office (OCO) was created in 2007 (http://www.ovsz.hu/oco/cimlap).
In July 2013, Hungary became part of Eurotransplant International Foundation. As reported by OCO (http://www.foedus-ja.eu/partners/7-orszagos-verellato-szolgalat-ovsz), the activity of the organ donation and transplantation process is currently carried out at two levels:

1. **Centrally.** It receives reports from Hungary and Eurotransplant area, estimates suitability of donors and all transplantable organs, informs the

competent transplant centres about the allocated organ, helps the donor hospital with the donor management and the logistics required *via the nationally appointed coordinators*, organizes the organ procurement process and transport, and develops the final and complete documentation of the entire procurement and transplant process.

2. **Hospital coordination**. During the procurement phase, clinical coordinators take over. They assist the procurement teams, collect all the relevant information, prepare the documentation, call in the chosen recipient, organize the patient's clinical examination and coordinate the transplant process. The establishment of hospital coordination is recent and aims at reaching 45 collaborating hospitals with the support of the Ministry of Human Resources.

The OCO also:

- ✓ Promotes organ donation and raise awareness at different levels (public through mass media, health care professionals through hospital visits)
- ✓ Organizes accredited training programmes for the professionals involved in the organ donation process
- ✓ Provides up-to-date information to the different stakeholders
- ✓ Facilitates the implementation of EU directives (such as 2010/53/EU directive on standards of quality and safety of human organs intended for transplantation)
- ✓ Participates in EU co-funded projects (ACCORD, FOEDUS, DOPKI, COORENOR, MODE)

The OCO's educational initiatives consider both the local and international experience such as the specialized training programs provided by Transplant Procurement Management.

The organ donation activity reported for 2014 shows a rate of 20.5 deceased donors pmp and 4.6 living donors pmp (in comparison with 2012 when the rate of donation was 14.32 deceased donors pmp and 5.3 living donors pmp) (IRODaT; Council of Europe & Organización Nacional de Trasplantes, 2015).

9. Education and training

One of the pivotal elements identified as a key success factor in organ donation is the training of healthcare professionals involved in the process, towards skills, competences and awareness (Shafer, Wagner, Chessare, Zampiello, Macbride & Perdue, 2006; Taylor and Mcgaw, 1998; Van Gelder et al., 2008). One of the recommendations of the Council of Europe: Recommendation Rec (2005) 11 of the Committee of Ministers to member states provides guidelines and recommendations to governments of member states as regards the role, functions, responsibilities and training of the organ donor coordinators that should be appointed in every hospital with an intensive care unit.

Moreover, through its "Action Plan on Organ Donation and Transplantation (2009-2015)", the European Commission (Commission of the European Communities , 2008) supports the implementation of effective training programs for organ donor coordinators. Several educational programs have been designed to support and underpin the European Commission's action plan.

Transplant Procurement Management (TPM)

Over the years, Transplant Procurement Management (TPM) was developed and grew to become one of the largest and most international training programs in organ donation and transplantation as well as tissue banking. Designed on a model of the Continuous Improvement Program (CIP) method (Advocate Research and Innovation Forum, 2012), TPM was launched in 1991 under the auspices of University of Barcelona (UB), Spain, and with the support of the Spanish National Transplant Organization (ONT). It gained the recognition of the Transplant Committee of the Council of Europe in 1994 and was awarded the "TTS-Genzyme Award for Education and Training in Transplantation" by "The Transplantation Society" (TTS) in 2008 (Paez et al., 2003; Istrate et al., 2015).

TPM is supported through the academic endorsement of UB and offers specialized face-to-face (F2F) courses at five different levels following a progressive level of expertise, different aims and length: New vital cycle (Awareness, 8h); Introductory (Motivation, 12h); Intermediate (Collaboration, 24h); Advanced (Fine-tuning, 40h); Postgraduate diploma (Specialization, 375h) and Master degree (Experts,

1500h). TPM combines participants' own knowledge based on their previous training and experience in the field with a pro-active involvement in real-life learning (Kolb, 1984). Moreover, through online (OL) learning programs, participants further fine-tune their skills and competencies within their own professional environment, which optimizes direct application of skills and knowledge in their own professional environment.

As proven by Knowles (Knowles, 1971), adult learning is most effective when information is presented in the context of a real-life situation. Malcolm Knowles suggested five principles of adult learning: 1) self-directed learning, 2) rich experiential base, 3) developmental tasks are associated with social roles, 4) problem-centred and 5) immediate application.

TPM has considered various **pedagogical paradigms** in its trainings, of which some imply teacher intervention while others do not require any teacher intervention of any kind (http://tpm-dti.com/en-training/). Please see below a classification of the paradigms used, according to the extent to which control of the process and content lies with the provider or with the user.

Teacher-managed learner centred learning (Stephenson & Sangrà)	
Constructivism	TPM takes into consideration the existing conceptual framework of its learner, their prior knowledge and experience, stimulates active participation, 'critical thinking, analysis and synthesis throughout the learning process' so that they can construct, shape and reshape their own knowledge and integrate it in the 'pre-existing intellectual constructs'.
'Post-industrial' or knowledge-based society	It goes hand in hand with the constructivist approach. The TPM approach relies on personal interactions, networking, data gathering and problem solving and underlines the importance of being able to adapt to change and to manage one's continuing learning.
Learner Centred learning	TPM learning is an active and dynamic process. Learners come with their own knowledge and experience and they continuously reformat and shape it. Learner centred approaches considers that learners may have different learning styles (Honey & Mumford, 1992). Most of us are capable of operating in more than one of the styles but we usually prefer one or two of them.

Table 1. Teacher-managed learner centred learning as classified by Stephenson & Sangrà

Learner-managed learner centred learning (Stephenson & Sangrà)	
Experiential learning	It underpins constructivism and is 'what human beings do all the time throughout their lives' (Alexander & Boud, 2001). Learning is a holistic process (Boud, Cohen & Walker 1993), where learners use their experience as basis and stimulus for learning, in combination with their emotions, will and cognitive endeavour to further construct their own experience. Learning is not a singular and isolated process, but is influenced by the social, cultural and emotional context in which it occurs. The main features of experiential learning are considered by TPM in both F2F and OL training programs.
Kolb's Learning Cycle	TPM employs the Kolb's Learning Cycle to engage learners and immerse them in the learning situation in a constructivist approach. The four cycle components (Kolb, 1984): experiencing, reflection, conceptualization, planning, pose challenges for the design of a suitable e-learning environment.
Tacit learning	It is experiential learning with one distinctive feature: the learner is not conscious that learning is taking place. In order to boost this type of learning, TPM designed various strategies such as personal reflection, portfolio development and experience sharing, used to help people unravel what they know and can do. Key references include Thomas Stewart (Intellectual Capital: The New Wealth of Organizations, 1997) & Donald Schon (The reflective practitioner, 1983).
'Communities of practice	It is often used (Wenger, 1998) through forum discussions and informal meetings and are addressed to specialists with similar interests to improve their knowledge and ability.

Table 2. Learner-managed learner centred learning as classified by Stephenson & Sangrà

According to the paradigms used, TPM developed its own instructional materials, based on learning theory and instructional practice. Most include very similar components. Some are enlisted below:

Instructional design models (Williams, Schrum, Sangrà & Guàrdia)	
The Generic Model – ADDIE	It is often used by TPM in tailored educational initiatives to assess training needs, develop and refine the training programs according to the audience as well as to choose the most appropriate instructional delivery mode (Fig 2). One of the research studies presented below followed the ADDIE instructional design model. Detailed in the method section.
The ASSURE model	Mainly used in the creation of the OL courses (Heinich, Molenda, Russell, & Smaldino, 2003), it includes: analyse learners and know your audience; state objectives; select and use instructional methods, media, and materials; require learner participation and last but not least evaluate and revise.
Rapid prototyping	It is a process by which TPM instructional designers develop within educational projects a small-scale prototype of the educational program to be developed. Partners and potential learners evaluate this prototype and according to their feedback further changes are made before the large-scale educational program is designed and developed. Thus, important changes are avoided when the final product is developed.
Four Component Instructional Design Model (4C/ID) (Van Merriënboer & Dijkstra, 1997)	The model refers to practice of the skills with information about the skills provided in the context of practice itself. The multitasking role of a health professional requires an 'integrated acquisition of multiple competences such as clinical reasoning and decision making, communication skills and management skills' (Vandewaetere, Manhaeve, Aertgeerts, Clarebout, Van Merriënboer & Roex, 2015). To boost such a complex learning, TPM makes use of real-life learning situations performed through simulations and traineeships.

Table 3. Instructional design models as classified by Williams, Schrum, Sangrà & Guàrdia

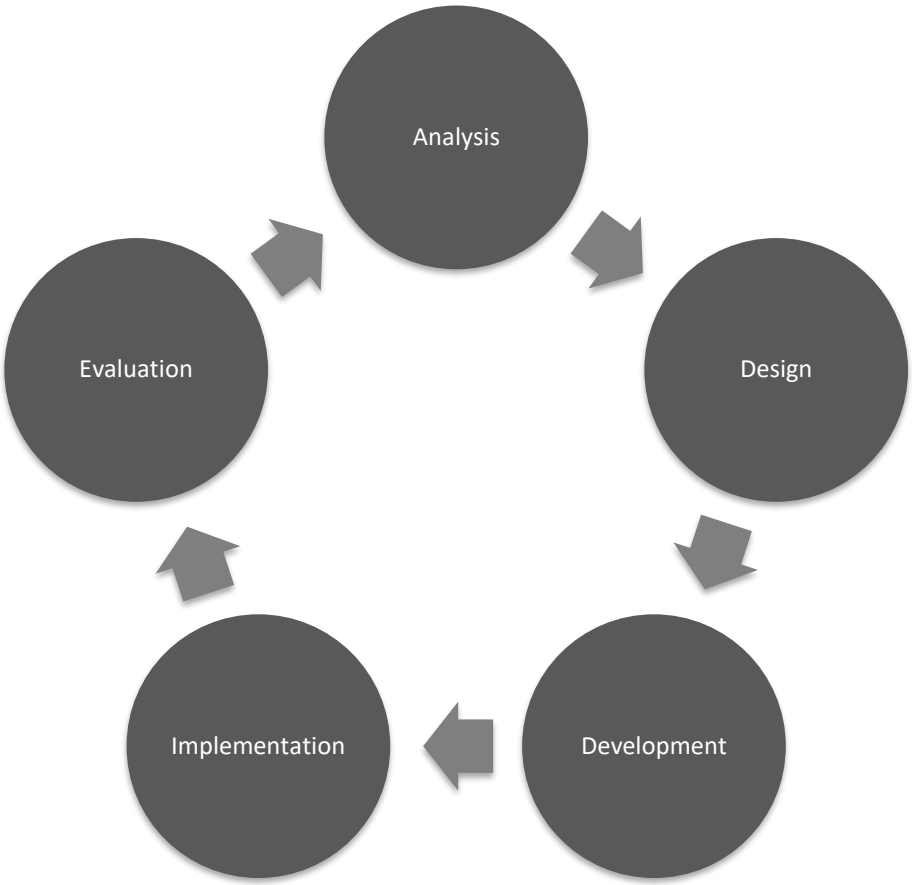


Figure 2. The five main steps of ADDIE.

From 1991, over 12,000 professionals from 101 countries throughout the world have been trained through the different educational models of TPM as following: 87.5% in F2F courses and 12.5% in OL courses (Paez et al., 2009).

With such a large number of professionals from around the world participating in TPM specialized training programs, their effect and impact need to be evaluated.

Hypotheses

Hypothesis 1

Increased awareness, knowledge, commitment and skills provided through education among health care professionals impact positively the organ donation activity and its parameters.

Hypothesis 2

Specialized training programs such as TPM have positive perceived benefits in the areas of career, collaboration, skills and ability in organ donation

Chapter 2. Methods

Two complementary research studies were conducted as following:

1. **European Training Program on Organ Donation (ETPOD)**
2. **Organ Donation Training and Systems Evaluation (ODTaSE).**

Whereas the first study (ETPOD) was designed to produce and implement a three-level specialized training methodology and measure its impact on organ donation figures, the second study sought to explore how specialized training programs such as TPM, and their benefits were perceived by participants. Previous findings (Rusesll & Van Gelder, 2008) support Herzberg's theory of motivation, and showed that "motivators leading to job satisfaction [among transplant nurses] include achievement, recognition, the work itself, responsibility and advancement". In our study, the influence of training was rated on 12 different items, including "motivation to work in donation and transplantation".

ETPOD

The ETPOD project (Manyalich, Guasch, Paez, Valero & Istrate, 2013) included 17 partner countries, 20 partner organizations from State agencies to universities, and 25 target areas (TAs) within Europe and Turkey and their representatives were divided into four working groups. TAs were selected according to the following criteria: to have at least one donor hospital and a population over 500.000 inhabitants. They were not necessarily representative for their countries, were of different sizes, with a diverse structure, and unequal investment in health (Eurostat, 2008). France was also part of the project, but without identifying any TA (Fig 3).

TPM along with IL3 (Institute for Lifelong Learning), UB, coordinated the development and implementation of the educational initiative. The educational methodology (Fig 4) employed various pedagogical paradigms, mostly teacher managed. A learner centred, constructivist approach overlapping with a post-industrial approach was applied in both components of blended learning, F2F and OL, to actively involve participants in the construction of their own knowledge based on their prior experience, as well as to facilitate personal interactions, networking, data-gathering and problem-solving during and after the training.

However, elements of experiential learning were also considered for the design of a suitable learning environment.
Different instructional designs were also used such as ADDIE further improved with ASSURE for the OL training and 4C/ID for F2F.

Figure 3. Twenty-five TAs from 16 countries were defined as following: Austria, Bulgaria, Cyprus, Estonia, Germany, Greece, Italy, Lithuania, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, and Turkey.

ADDIE instructional design

1. ANALYSIS. Working group 1 was responsible for analysing the European current practices on organ donation within two areas:

- ✓ Training needs. A study was conducted among healthcare professionals involved in organ donation, assessing the topics of main interest to be included in the new course.
- ✓ Donation rates. A comparative analysis was performed, comparing organ donation rates before and after the implementation of the training programs in the 25 different TAs in accordance with their organizational structure and resources available. The survey is described in detail in point 4. of Evaluation.

According to the results of the training needs analysis three different professional levels were identified: junior organ donor coordinators, senior organ donor coordinators and health care managers, and three training programs were set accordingly:

- ✓ Professional Training on Organ Donation (addressed to juniors)
- ✓ Essentials in Organ Donation (addressed to seniors as advocates and multipliers of specialized training programs)
- ✓ Organ Donation Quality Management (addressed to managers)

The audience for each level, learning goals, location, technology and digital skills, as well as resources available was assessed. Differences between F2F and OL training methodologies were considered regarding planning, delivery of information, participation and interaction, monitoring and evaluation, ICT support, feedback, teaching collaboration, workload as well as time devoted.

2.DESIGN & DEVELOPMENT. According to the analysis results, blended learning methodology (OL & F2F) was mostly considered:

- ✓ Professional Training on Organ Donation (addressed to juniors): blended
- ✓ Essentials in Organ Donation (addressed to seniors): blended
- ✓ Organ Donation Quality Management (addressed to managers): F2F (due to limited availability)

For such a decision the following reasons were considered:

- ✓ In OL trainings participants remain in their natural context on the job or in the community, which facilitates the immediate application of skills. It is cost effective and facilitates the access of everyone from anywhere. Thus, participants from all the 25 TAs could be reached easily. Moreover, the OL gives certain flexibility in studying and completing the assignments, which ensures a better attendance despite professional and personal commitments.
- ✓ F2F is essential to reinforce the knowledge and skills acquired, facilitate learning by doing as well as personal interactions, networking, data-gathering and problem-solving during and after the training.

Educational resources were evaluated and course curriculum developed for each level. Instructional objectives were written, units, lessons and modules outlined and developed along with graphics, multimedia, practical activities, communication and interaction channels.

Participants were recruited according to their professional profile and the requirements of each training level. For selection purposes, the following main aspects were considered: profession, specialization, education, and number of years of experience.

OL training. Whereas ADDIE was used for the ETPOD educational initiative in general (as a design valid for any educational setting), for OL training the ASSURE instructional design (Heinich et al., 2003) was further considered as a framework mainly recommended for conceptualizing the creation of web-based courses (from analysis of the students, status of the objectives, selection of methods, technology and material distribution system, use of the media in materials, student participation to evaluation and review).

The learning model considered was the *Wrap Around* Model (Mason, 1998) with tailored materials 'wrapped around' existing ones, with OL discussions that facilitated exchange of information and continuous building of knowledge. This model gave 'freedom to learners to interpret the course for themselves' (Stephenson & Sangrà), boosted critical thinking as well as an analytical spirit. Experts played the role of coach or guide and communication was mostly asynchronous but also synchronous through chat sessions.
Learners in the web-based classroom remained imbedded in their natural context on the job or in the community. The potential for application of skills and knowledge in those contexts was the goal of instruction and was referred to as transfer of training.

An e-learning platform was made available to offer the on-line training programs developed within the project. To get familiar with the learning environment, a preliminary training on how to handle the virtual environment was foreseen.

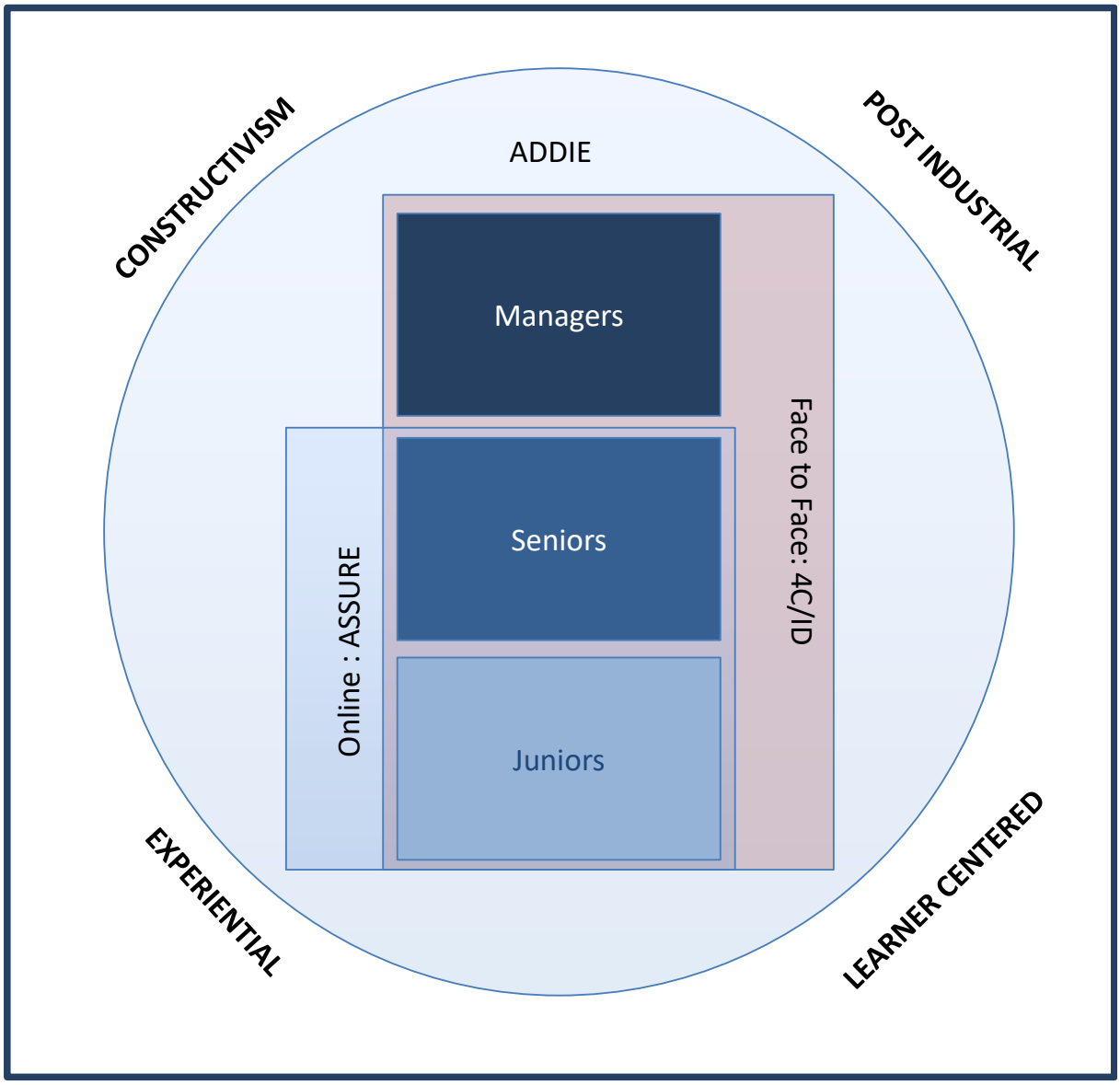


Figure 4. Educational methodology used in ETPOD

Quality indicators considered for OL training (as classified by Williams, P. et al.) are detailed in table 4 below.

Course Introduction	Description of course Course objectives clear and measurable Requirements (technical, academic, personal, time, other) Policies & procedures Means of communication

Course Introduction	Calendar Assignments
Modules of Instruction	Modules with appropriate size Include: objectives, subject matter content, activities, interaction and assessment Clear and sufficient instructions Writing style was appropriate for audience Graphics used to add interest, clarify concepts, or demonstrate processes
Interactivity of three types (Learner to Instructor, Learner to Content, Learner to Learner)	Specified communication channels Automated programmed functions Appropriate questioning and discussion Collaborative activities
Resources available	Instructional resources: web based content, library resources Student support services: advisement and counselling, Enrolment and admissions Technical support
Activities Activities	Require cognitive interaction with content Be closely related to objectives/outcomes Be varied Be appropriate to medium Include field based, authentic application of skills and knowledge when possible Be collaborative in nature when possible Include discussions that are purposeful and focused Involve higher cognitive processing: analysis, synthesis & evaluation
Assessment	Directly tied to objectives/performance outcomes Appropriate to medium Appropriately secure Addresses higher level cognitive skills
Web interface	Easily navigated

Web interface	Not distracting from content Promotes learning Accessible to all learners, complying with acceptable Standards for information accessibility (see Web Accessibility Initiative: www.w3c.org/WAI/)

Table 4. Quality indicators for OL training. Classification made by Williams et al.

F2F training. OL and F2F were designed as complementary components to ensure that the knowledge acquired during the OL training was reinforced and deepened in the F2F part. The F2F component was further improved with the 4C/ID instructional design model to boost learning by doing methodology. It included key lectures, case studies, indoor and outdoor group activities, action learning exercises, real-life simulations created to immerse the participants in the learning situation (Kolb, 1984) and demonstrate their skills and competences.
Once the curriculum and programs for each F2F event were designed, indicators were also foreseen to evaluate their quality. Each item of the program as well as the organizational aspects was to be evaluated on a Likert scale from 1 (poor) to 5 (excellent).

Three level training program

The representatives of the ETPOD consortium were divided into four working groups. Whereas working group 1 developed the surveys, the other working groups (WG) designed and developed the three level training program as following:

a. Essentials in Organ Donation (OL and F2F) was designed by WG 2.

Objectives:

To train healthcare professionals as advocates of organ donation programs within local areas or hospitals, in their own language and in alignment with their current medical practice and legislation

To provide participants with the knowledge and skills required to replicate the educational training program

To design appropriate educational material necessary to implement seminars on organ donation, the so called Essentials in Organ Donation (EODs)

The program was designed and developed as a cascade blended training, and consisting of two steps as following:

1st step. *Training for Trainers* (OL and F2F). It addressed senior organ donor coordinators and aimed to acquire competences, skills and methodology required to effectively carry out training courses in organ donation. The OL training included fundamental teaching theory, organ donation training methodology and learning activities necessary. It also was designed to lead participants to develop along with their tutors the educational materials and tools required to replicate EODs in their TAs. These materials were afterwards to be adapted to the local legislation and current medical practices, and translated into the local language. The F2F course included mainly simulations, workshops and project developing and aimed at reinforcing the knowledge acquired in the OL. Once the Training for Trainers completed, participants were endorsed to implement the second part of the program (EODs) in their TAs.

2nd step. *EODs*, 8-academic-hour seminars to be implemented by the senior organ donor coordinators after completing the training for trainers program. The seminars aimed at providing healthcare professionals involved in any phase of organ donation (such as intensive care units, postoperative recovery and emergency rooms, etc.) with the basic knowledge, promoting a positive attitude toward it (Roels, Spaight, Smits & Cohen, 2009) and empowering the detection of potential donors.

b. Professional Training on Organ Donation (OL and F2F) was designed by WG 3.

Objective: to provide participants with the fundamental knowledge, goals and sequence of actions to achieve organ recovery with optimal efficiency.

It addressed junior organ donor coordinators or due to join a Transplant Coordination Office.

The course included all the aspects of the organ recovery process and organization: 'Donor Detection Systems'; 'Brain Death Diagnosis'; 'Donor Management & Organ Viability'; 'Family Approach for Organ Donation', and 'Organ Recovery Organization, Preservation and Allocation Criteria'.

In the process of content design Reigeluth's Elaboration theory (1999a,b) was mainly applied, alternating between a general overview of the content and a focus on one piece and it fits into the whole.

Whereas the OL introduced the main concepts reinforced through practical activities, the F2F part that followed was mainly practical, with simulations that emulated the whole donation process.

c. Organ Donation Quality Management (F2F) was designed by WG 4.

Objective: to provide managers of national, regional, and local organ recovery organizations with the skills required to efficiently organize, manage, and evaluate a transplant area to increase organ donation in the TAs as well as to promote the implementation and assessment of quality and safety measures.

The course considered F2F training. Participants were provided with the concepts related to leadership, management and quality control systems required in donation programs as well as with the opportunity for practice that turns the newly acquired knowledge into experience.

At each educational level, instructional materials were revised and validated before implementing.

3. IMPLEMENTATION. It referred to full-scale implementation with respect to the project timeline and included:

- ✓ conducting the surveys
- ✓ collecting the data
- ✓ developing the educational materials
- ✓ implementing the training program (OL and F2F), including the Training for Trainers
- ✓ translating and reviewing the contents required for the EODs
- ✓ implementing the EODs in the TAs assigned
- ✓ support for learners and teachers

As for the implementation of the OL courses, it also included:

- ✓ content digitalization and review
- ✓ creation and maintenance of virtual classrooms
- ✓ access to participants and experts
- ✓ tutorials on how to move around the virtual classrooms
- ✓ technical and scientific coordination
- ✓ system administration

4. EVALUATION.

Different evaluations were carried out:

- ✓ Evaluation of training quality
- ✓ Evaluation of learners' knowledge
- ✓ Evaluation of training impact

Evaluation of training quality. An assessment questionnaire aimed at evaluating the quality of each course and enabled further improvement. It covered an exhaustive assessment of theoretical content (per modules and units), activities, syllabus, texts, graphics, audiovisual, bibliography, glossary, course coordination, faculty staff (their ability and efficacy in solving issues raised, monitoring and giving requested feedback), technical support, and last but not least, course applicability to participants' job. Thus, the feasibility of training transferability was evaluated. All aspects were evaluated by using the Likert scale: 1= Poor; 2= Average; 3= Good; 4= Very Good; 5= Excellent.

Evaluation of learners' knowledge. It included formative and summative evaluation. Continuous assessment was combined with final evaluation in order to provide an accurate and complete picture of the participant's level of knowledge during and at the end of the course.

The strategy was followed with the awareness that each participant country has different donation rates pmp (European Network of Regions Improving Citizens' Health) and different organizational models (European Commission, 2006).

Evaluation of training impact. A comparative analysis was performed, comparing organ donation rates before and after the implementation of the training programs in the 25 different TAs in accordance with their organizational structure and resources available. Two different survey (S) identification points were established as following: January–June 2007 (survey no. 1: S1) and January–June 2009 (survey no.2: S2), namely before and after implementing the whole educational program. In a prospective descriptive study design, data were collected per TAs, including total number of population, total number of hospitals, total number of hospital beds, total number of ICU beds, total number of neurosurgery departments, total number of admitted patients in ICU, total number of ICU deaths, total number of declared brain deaths in ICU, total numbers of

refusals, total number of utilized donors, total number of organs recovered, and total number of donor coordination staff (fulltime or part time).

To assess the impact of the training program, the 2007 related data (S1) were compared with the data for 2009 (S2). To analyze the changes occurred, understand the relation among the different factors and the mutual influence, two main groups of variables were considered, such as those related to organization (existence of training activity in TAs and the number of donor coordinators employed part time or full time) and donation process (total number of diagnosed brain deaths, total number of refusals, total number of utilized donors, and total number of organs recovered).

Univariate statistical analysis using Fisher-exact and Student t-paired tests was used to compare data. A Spearman test was used to analyze the correlation between factors. P-value equal to or smaller than 0.05 (5%) was seen as statistically significant. All statistical tests were performed using the SPSS® software version 15 (SPSS Inc., Chicago, IL, USA).

ODTaSE

As for the ODTaSE study (Istrate et al., 2015), it investigated the perceived benefits of TPM specialized training programs (including the ETPOD educational initiative) on professional competence development and career evolutions of donation and transplantation (D&T) related health care workers.

The study methodology (Fig 5 a & b) included the development in 5 languages (English, Spanish, Italian, French and Portuguese) of a **web-based questionnaire** with 49 multiple choice, open answer, rating scales and agreement scales questions was developed. This study reported on a subset of questions from this survey dealing with the objective of the study (Annex 6). The study was approved by Institutional review boards (IRBs) at the UB, Spain (IRB00003099), and Purdue University (PU), USA (IRB Protocol #1202011844). The time required to complete the survey was recorded as approximately 15-20 minutes. A pilot test was performed on a sample of ten subjects. No survey pitfalls were reported.

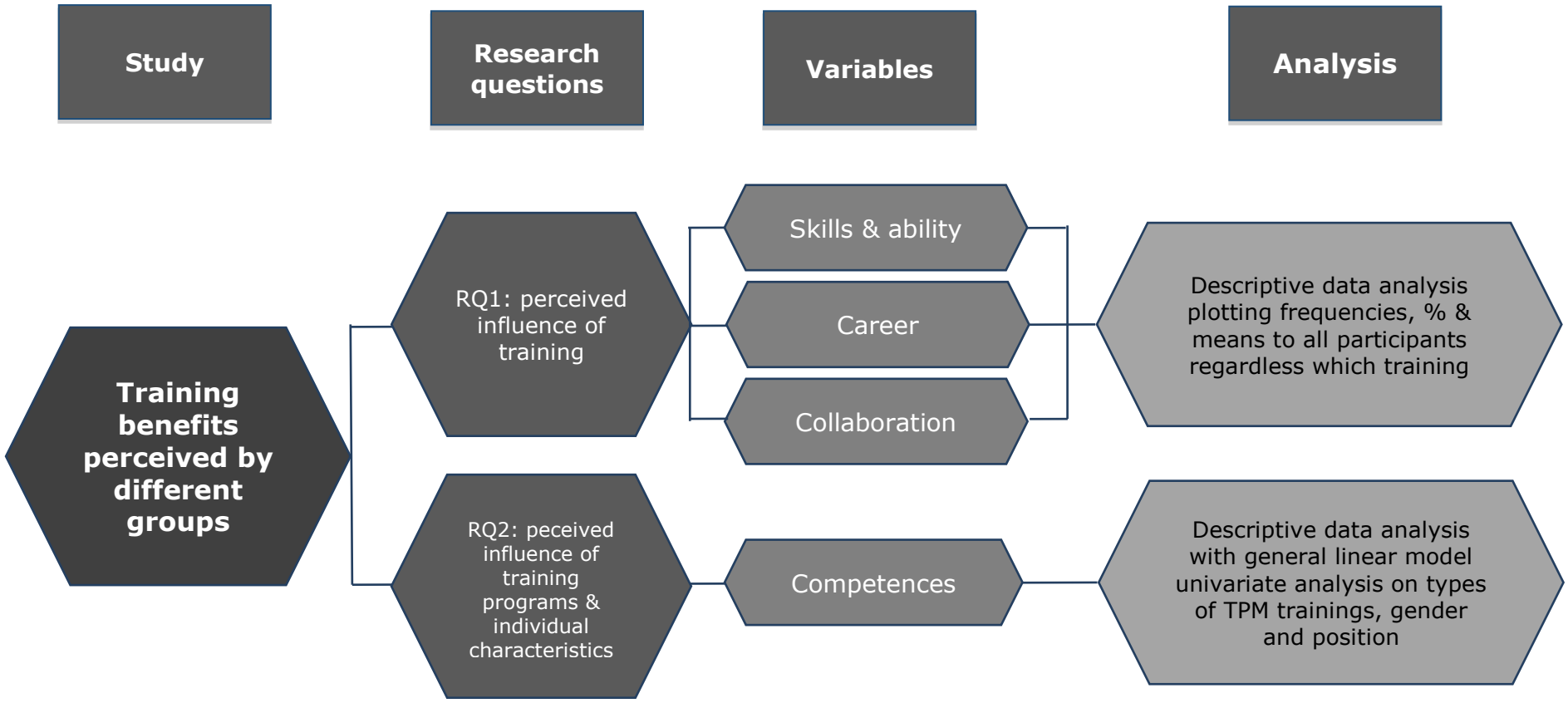


Figure 5a. ODTaSE methodology

Figure 5b. ODTaSE distribution

Participants. All contacts available in the TPM database were contacted in 2012. A total of 6839 subjects who had participated in TPM or related training courses were emailed a cover letter and link to the online survey. They were also asked to forward the link to other individuals active in D&T. Two reminding emails were sent in the following month. Additionally, links were posted on Facebook (www.facebook.com/transplantprocurementmanagement) and handed out at organ donation meetings and congresses.

The participation in the study was voluntary. There were no direct benefits and no compensation.

Participants were asked to select the training they believed was most influential in considering their responses to the remaining survey items. Participants who selected TPM were asked to specify which courses they had attended. The types of courses were grouped in terms of similarity and given a categorical ranking from 1 – 7 based on how advanced and intensive the training was, with a ranking of 1 being the most advanced (the Master course in Donation 1, introductory F2F 2, intermediate F2F 3, advanced F2F 4, essentials in donation 5, blended (BL): OL and F2F 6, and OL courses 7). In case of multiple courses for one subject, the more advanced training category was used in our analyses.

Respondents were asked to rate the influence of trainings on 12 different items, including "respect from peers", "advantages in promotions", "technical skills", "knowledge", "networking ability", "motivation to work in transplantation", "collaborative opportunities", "ability to change policies", "ability to change practices", "desire to innovate", and "communication skills related to D&T". (Annex 4)

For most questions, the analysis and reporting focused on professionals who are still active in donation.

All data were collected by means of Qualtrics (Provo, Utah, USA) web-based survey software and kept confidential through personal password control. Additionally, all responses were anonymous and no identifiable information was collected in this regard.

Two main research questions were identified for the current study:

Research Question 1 (RQ1): "What is the perceived influence of specialized training programs on career, collaboration, and skills and ability in D&T?"

RQ1 was subject to descriptive data analysis, plotting frequencies, percentages and means, and referred to all participants who answered the survey items, regardless of which training they selected as being most influential.

Research question 2 (RQ2): "Do the different types of training programs (OL, F2F, local/national/international etc.) and individual characteristics (gender, position at time of training) have different perceived influences on competences (career, collaboration, skills and ability) in D&T?"

In RQ2 descriptive data were added a series of analyses performed using General Linear Model univariate analysis run on types of TPM trainings, gender, and position at time of training on the dependent variables presented above. A value of $p<0.05$ was considered as statistically significant. All statistical tests were performed using the SPSS® software version 21 (SPSS Inc., Chicago, IL, USA).

TPM specialized training programs investigated

TPM trainings included those developed within ETPOD project as well as others such as:

- ✓ *F2F courses in organ donation*: introductory, intermediate and advanced. These courses are addressed to healthcare professionals and health care managers involved at different levels in organ donation, wishing to update their knowledge and reinforce their skills. The course methodology takes into account theoretical conceptualization, active participation in class, case methodology, simulations and workshops, action learning, interactive learning process and outdoors trainings.
- ✓ *Monographic OL modules*: Donor Detection System, Brain Death Diagnosis, Donor Management, Family Approach, Organ Retrieval
- ✓ *Tissue Banking blended training* (OL&F2F). The training program was produced within the **European Quality System for Tissue Banking** (EQSTB) project (DGSANCO–EAHC 2003209), which aimed at analyzing throughout different working areas the factors that may influence the final tissue quality and safety for transplantation, providing greater benefit to recipients (Manyalich, M. et al., 2009; Kaminski, Uhrynowska-Tyszkiewicz, Miranda, Navarro & Manyalich, 2007). Fifteen national organizations and tissue establishments from 12 European countries took part in this project. The course is addressed to professionals working in tissue and cell procurement, processing, storage, quality control and distribution.

- ✓ *International Master in Donation of Organs, Tissues and Cells for Transplantation.* The master degree aims at training as experts the healthcare professionals involved or due to join the organ and tissue donation for transplantation. It counts with the academic endorsement of UB and gathers all the training programs developed within ETPOD and EQSTB project such as: Professional training in Organ Donation, Essentials in Organ Donation, Organ Donation Quality Management, Tissue Banking. The program includes as well as an Organ Transplantation blended course and a 6-week internship in a medical/research centre. It consists of 1500 study hours (60 ECTS) and has a modular structure allowing participants to enrol the modules separately and complete the master program in more than one academic year.

Chapter 3. Results

ETPOD

Within this study the results obtained are as following:

Data from 220 hospitals in 25 TAs were analyzed by working group 1. Table 5a–d summarizes the different descriptive data collected at the beginning and at the end of the project.

TAs were of different sizes, with a population ranging from 500.000 to 4.000.000 inhabitants. The number of hospitals per TA varied considerably. While in 18 TAs, the number of hospitals varied between 2 and 5, there were TAs as Italy (IT1) and Austria (AU1) with a very high number of hospitals, 76 and 68, respectively. These figures include a high number of hospitals with no donation potentiality. The number of ICU beds also differed between TAs. The number of brain deaths reported in the ICU ranged from 76 in Italy (IT1) to 0 in Romania (RO2). (Table 5a,b) The highest number of refusals, 52, was registered in Austria (AU1). However, the highest number of utilized donors and recovered organs was registered in the same TA (AU1) (69 and 228, respectively). Sweden (SE1) reported the highest number of donation coordinators (Table 5c,d).

Comparing the data collected before and after the implementation of the educational program, there were no differences in TA population, number of hospital beds, number of ICU beds, neurosurgical units or professionals devoted to donation, and TA deaths (Table 5a–d). Although the number of brain death cases diagnosed increased, the difference was not statistically significant.

The number of utilized donors identified increased from 15.7 ± 14.3 (95% CI: 9.8–21.6) in January–June 2007 (survey S1) to 20.0 ± 17.1 (95% CI: 13–27.1) in January–June 2009 (survey S2) (P = 0.014) and the number of organs recovered increased from 49.7 ± 48.5 (95% CI: 29.6–69.7) in S1 to 59.3 ± 52.1 (95% CI: 37.8–80.8) in S2 (P = 0.044). In 16 (64%) TAs, the number of utilized donors detected increased, in two remained unchanged and it decreased in seven. The number of organs recovered increased in 19 (76%) TAs, remained unchanged in one and decreased in five. No relationship could be found between the profile of the TAs and their results.

Table 5a. General and ICU information descriptive data collected for every Target Area at the beginning (Survey 1: year 2007) and the end (Survey 2: year 2009) of the project. Blanks were left where information was not provided.

		General information						ICU		
Country	**TA ID**	**Population (thousands) S1/S2**	**Hospitals**	**Total beds S1/S2**	**Total deaths S1/S2**	**ICU beds S1/S2**	**Neuro-surgery Facility Units S1/S2**	**Patients admitted in ICU/year S1/S2**	**ICU Deaths /year S1/S2**	**Declared brain deaths in ICU/year S1/S2**
Austria	AU1	3.523/3.600	68	22179/22250	34000/36500	413/420	5	-	4420/4520	69/74
Bulgaria	BG1	500/480	2	1500/1950	1197/1474	26	2/1	959/1117	419/247	14/10
Cyprus	CY1	700	5	1013	-	64	-	-	180/-	5/8
Estonia	EE1	1.342	3	2486/2369	2231/2205	117/97	2/1	8683/6428	655/486	26/40
Germany	DE1	1.000	2	2460	1489/1586	249	2	14195/12421	770/1017	33/21
Germany	DE2	626	2	2600/2580	1088/1683	211	2	14502/12282	1000/1056	20/35
Germany	DE3	350	4	-/4047	-/3421	268	4	9980/9978	424/412	55/57
Greece	GR1	800	2	1606	2815/2345	72	2	825/693	271/201	18/9
Greece	GR2	1000	2	1750	1650/990	75/80	2	1286/893	355/198	30/20
Italy	IT1	4000	76	16773	8222	184/192	9	6436/6318	1765/1835	76/361
Italy	IT2	250	2	500/724	100/695	22/23	2	576/703	18/246	30/22
Lithuania	LT1	1909/1899	4	3744/3914	2967/2713	125/155	4	23210/21235	1677/1701	70/89
Poland	PL1	500	2	1449/1264	1374/-	21/22	2	668/698	316/327	12/4
Poland	PL2	900	2	1374/1371	1401/1540	20/17	3	358/414	137	15/8
Poland	PL3	364	2	1779/1731	1322/1336	23	2	801/762	242/226	16/30
Portugal	PT1	950	3	907	1391/-	73/75	1	751/1865	341/231	
Romania	RO1	900	3	3439/3461	2631/2517	65/67	1	5817/6013	1571/1664	33/36
Romania	RO2	250	1	1500/1300	1000/893	24	1	1983/2104	190/237	0/4
Slovak Rep.	SK1	865	9	4734	-	49/52	12/14	-	-	13/26
Slovenija	SL1	810	3	2920/2855	2833/-	88/95	1	7778/-	554/-	46/33
Spain	ES1	300	1	425/400	816/921	18	1	477/488	106/108	10/17
Spain	ES2	100	1	626	1016/-	22	1	-	220/161	45/41
Sweden	SE1	1600	14	4041	6891/6900	87	1	6390/6857	693/624	32/33
Turkey	TR1	1700	4	2044/2215	1955/2112	74/92	3	1031/2394	600/642	43/48
Turkey	TR2	3500/3356	3	4101/3855	2760/2804	384/170	3	1378/3707	682/1010	73/75

Table 5b: Summary of general and ICU information descriptive data collected at the beginning (Survey 1: year 2007) and the end (Survey 2: year 2009). (Data expressed as mean ± standard deviation (range); Statistical analysis: Paired t-test)

	2007	2009	p
Population (thousands)	1149.6 ± 1059.6 (100-4000)	1145.7 ± 1054.2 (100-4000)	0.567
Hospitals	8.8 ± 19.3 (1-76)		
Total beds	3581.3 ± 5101.1 (425-22179)	3607.8 ± 5000.7 (400-22250)	0.779
Total deaths	3688.6 ± 7029.4 (100-34000)	4255.6 ± 8049.3 (695-36500)	0.314
ICU beds	111.0 ± 112.4 (18-413)	104.8 ± 99.3 (17-420)	0.495
Neuro-surgery Facility Units	2.5 ± 1.9 (1-14)		
Patients admitted to ICU	5380.4 ± 6221.3 (358-23210)	4868.5 ± 5514.8 (414-21235)	0.578
ICU Deaths	733.6 ± 923.8 (18-4420)	785,7 ± 994.7 (108-4520)	0.503
Declared brain deaths in ICU	32.7 ± 22.5 (0-76)	45.9 ± 71.0 (4-361)	0.281

Table 5c. Donation and coordination descriptive data collected for every Target Area at the beginning (Survey 1: year 2007) and the end (Survey 2: year 2009) of the project. Blanks were left where information was not provided. (*data changed from 0 to 2 donors and from 0 to 4 recovered organs respectively.)

	Donation and Coordination											
Country	**TA ID**	**Refusals**		**Utilized donors**			**Organs recovered**			**Total donation coordinators 2007/2009 S1/S2**	**full time 2007/2009 S1/S2**	**part time 2007/2009 S1/S2**
		2007	**2009**	**2007**	**2009**	**%**	**2007**	**2009**	**%**			
Austria	AU1	52	58	69	78	13.0%	228	247	8.3%	9	2	7
Bulgaria	BG1	6	3	8	5	-37.5%	15	16	6.7%	4/3	0	4/3
Cyprus	CY1	-	-	5	8	60.0%	13	21	61.5%	3/5	3/4	0/1
Estonia	EE1	5	7	10	33	230.0%	19	85	347.4%	4/6	2/1	2/5
Germany	DE1	3	7	20	16	-20.0%	65	52	-20.0%	5	5	0
Germany	DE2	6	12	7	23	228.6%	24	74	208.3%	2/4	2	0/2
Germany	DE3	20	20	23	18	-21.7%	84	92	9.5%	5/6	3/2	2/4
Greece	GR1	12	1	7	7	0.0%	15	20	33.3%	2	0	2
Greece	GR2	-	7	8	12	50.0%	24	29	20.8%	3	3	0
Italy	IT1	29	36	27	44	63.0%	91	126	38.5%	25/27	23/27	2/0
Italy	IT2	6	11	12	9	-25.0%	40	34	-15.0%	15/2	0	15/2
Lithuania	LT1	35	24	33	50	51.5%	104	105	1.0%	5/9	2	3/7
Poland	PL1	-	1	7	1	-85.0%	22	2	-90.9%	5	0	5
Poland	PL2	0	3	2	4	100.0%	4	12	200.0%	0	0	0
Poland	PL3	3	11	13	19	46.2%	38	46	21.1%	4/2	0/1	4/1
Portugal	PT1	-	-	6	13	116.7%	16	33	106.3%	2/3	0	2/3
Romania	RO1	13	15	4	14	250.0%	15	27	80.0%	1	0	1
Romania	RO2	-	2	0	2	-*	0	4	-*	1	1	0
Slovak Rep.	SK1	-	-	13	26	100.0%	34	81	138.2%	12/11	0	12/11
Slovenija	SL1	7	4	18	24	33.3%	73	85	16.4%	2	0	2
Spain	ES1	2	6	7	9	28.6%	24	25	4.2%	3/4	0	3/4
Spain	ES2	7	6	30	23	-23.3%	84	71	-15.5%	3	0	3
Sweden	SE1			19	25	31.6%	76	102	34.2%	100/35	0	100/35
Turkey	TR1	23	28	20	20	0.0%	46	46	0.0%	7	7	0
Turkey	TR2	49	57	24	18	-25.0%	88	48	-45.5%	7/5	2/3	5/2

Table 5d: Summary donation and coordination descriptive data collected at the beginning (Survey 1: year 2007) and the end (Survey 2: year 2009) of the project. (Data expressed as mean ± standard deviation (range); Statistical analysis: Paired t-test)

	2007	2009	p
Refusals	15,4 ± 16.0 (0-52)	15.2 ± 16.9 (1-58)	0.218
Utilized donors	16.3 ± 14.2 (2-69)	20.0 ± 17.1 (1-78)	0.016
Organs recovered	49.7 ± 48.5 (0-228)	59.3 ± 52.2 (2-247)	0.044
Total donor coordinators	9.2 ± 19.7 (0-100)	6.4 ± 8.0 (0-35)	0.310
Full time donor coordinators	2.2 ± 4.7 (0-23)	2.4 ± 5.4 (0-27)	0.284
Part time donor coordinators	7.0 ± 19.7 (0-100)	4.0 ± 7.0 (0-35)	0.276

The results of working group 2 are summarized in Table 6. Sixty EOD seminars were carried out and a total of 3163 participants were trained. Seminar assessments were answered by 1332 participants. The results concerning lectures evaluation, total number of questions answered in the EOD tests, participants' professional background and their level of involvement in the donation – transplantation process, as well as changes in their attitude toward donation after attending the seminar are all shown in Tables 6 and 7. No correlation was found between the number of participants in the EOD seminars and the changes reported in brain death diagnoses, number of utilized donors, and number of organs recovered (Table 5c,d).

Table 6. Number of EOD seminars and participants in each Target Area. EOD seminars content, lectures and post lecture discussions were scored by participants on a 1 to 5 scale (1-poor and 5-excellent). (Data expressed as number of cases (n) or mean +/- Standard deviation; blanks = missing data)

TA	Country	Seminars (n)	Participants (n)	Contents evaluation score	Presentations evaluation score	Post lecture discussions score
AU1	**Austria**	4	98	-	-	-
BG1	**Bulgaria**	1	106	-	-	-
CY1	**Cyprus**	1	30	-	-	-
DE1	**Germany**	3	47	3.7	3.1	3.3
DE2	**Germany**	2	61	3.9	3.9	3.9
DE3	**Germany**	3	66	3.1	3.2	3.1
EE1	**Estonia**	4	176	4.6	4.5	4.6
ES1	**Spain**	2	120	4.0	4.1	4.2
ES2	**Spain**	1	142	4.3	4.5	4.5
GR1	**Greece**	2	110	4.5	4.4	4.5
GR2	**Greece**	2	120	4.5	4.4	4.5
IT1	**Italy**	4	103	4.2	4.3	4.1
IT2	**Italy**	3	122	4.3	4.3	4.1
LT1	**Lithuania**	3	239	4.4	4.4	4.5
PL1	**Poland**	2	59	4.3	4.0	4.2
PL2	**Poland**	2	213	4.3	4.3	4.2
PL3	**Poland**	3	168	4.2	4.2	4.3
PT1	**Portugal**	3	162	-	-	-
RO1	**Romania**	3	180	4.4	4.4	4.2
RO2	**Romania**	1	60	3.7	3.7	3.7
SK1	**Slovak Rep.**	1	45	3.9	3.9	4.0
SL1	**Slovenia**	4	285	4.7	4.7	4.7
SE1	**Sweden**	4	234	4.2	4.2	4.3
TR1	**Turkey**	1	101	4.1	4.1	4.0
TR2	**Turkey**	1	116	-	-	-
total		60	3163	4.2 ± 0.4	4.1 ± 0.4	4.1 ± 0.4

Table 7. Characteristics of participants in the EOD seminars. EOD tests evaluation report. Data expressed as number of cases and percentages.

Participants Professional background	**n**	**%**
Manager	34	2.5%
Nurse	648	48.5%
Clinical Laboratory Technician	51	3.8%
Physician	396	29.7%
Administration	16	1.2%
Others	190	14.2%
Involvement level in the donation-transplantation process		
Critical care, Intensive Care Unit, Emergency room	695	53.9%
Recipients Transplant Coordinator	17	1.3%
Recovery Team: Surgery	112	8.7%
Donor coordinator	23	1.8%
Recovery Team: Anaesthesia	94	7.3%
Others	348	27.0%
After seminar, attitude towards donation changed positively		
Strongly Agree	490	37.7%
Somewhat Agree	524	40.3%
Neither	259	19.9%
Somewhat Disagree	21	1.6%
Strongly Disagree	7	0.5%
Evaluation test questions answered by participants		
correct	26718	74.0%
Incorrect	8968	24.8%
not-answered	433	1.2%

The number of experienced organ donor coordinators as multipliers of EOD seminars who attended the F2F and the OL 'Training for Trainers' courses are shown in Table 8. From a total number of 51 participants who took part in the OL course, 43 attended the face-to-face training and 37 got certified, representing 72.6% of the total number of participants. The course evaluation results are also summarized in Table 8. The overall assessment shows that the objectives of the training course were accomplished (Table 8).

Table 8. Participants profile in the "Training for Trainers" course, number of certified participants and Participants' course evaluation results. Scoring was performed on a 1 to 5 scale (1-poor and 5-excellent). Data expressed as number of cases and percentages or mean ± standard deviation.

FACE TO FACE PARTICIPANTS		
Profile	n	%
Medical Doctor	33	76.7%
Registered Nurse	2	4.7%
Other	8	18.6%
Specialties		
Intensive Care	16	37.2%
Transplant Coordination	12	27.9%
Surgery	8	18.6%
Anesthesiology	6	14%
Traumatology	1	2.3%
ON-LINE PARTICIPANTS		
Certified (n)	37	72.55%
ON-LINE COURSE	Training	Activities
Presentation	4.0 ±0.1	3.9 ± 0.2
Structure	3.9 ±0.1	3.8 ± 0.2
Content	4.0 ±0.1	3.8 ±0.3
Objectives accomplished	3.8 ± 0.5	3.9 ±0.3

Table 9 summarizes the final results, profiles, and specialties of participants who attended the five OL modules of the 'Professional Training on Organ Donation' program. As seen, there is a wide range of specialties involved. However, the most important group comes from ICU (28.9%), followed by transplant coordination (23.7%). A great majority were physicians (92.1%). No correlation was found between the scores obtained by the participants in the 'Professional Training on Organ Donation' program and the changes reported in brain death diagnoses, number of utilized donors, and number of organs recovered. No correlation between course results (scores) and outcome in terms of number of donors detected or organs recovered has been established.

Country	**TA**	**Final Course Results**
Austria	AU1	7.4±0.4
Bulgaria	BG1	2.5±3.5
Cyprus	CY1	8.0±0.1
Germany	DE1	3.6±3.1
Germany	DE2	1.5±1.5
Germany	DE3	3.9±4.1
Estonia	EE1	8.1±0.3
Spain	ES1	4.1±2.3
Spain	ES2	2.4±2.9
Greece	GR1	1.0±0.7
Greece	GR2	1.6±0.21
Italy	IT1	1.5±2.1
Italy	IT2	4.7±2.9
Lithuania	LT1	8.4±0.1
Poland	PL1	4.2±3.6
Poland	PL2	4.2±2.8
Poland	PL3	5.4±2.5
Portugal	PT1	4.2±6.0
Romania	RO1	8.9±0.2
Romania	RO2	5.2±2.3
Sweden	SE1	3.6±5.0
Slovenia	SL1	8.3±0.5
Slovak Rep.	SK1	-
Turkey	TR1	5.4±2.1
Turkey	TR2	5.3±3.6
Participants profile	***n***	**%**
Medical doctor	35	92.1%
Registered Nurse	3	7.9%
Specialties	***n***	**%**
Anaesthesiology	4	10.5%
Cardiology	1	2.6%
ICU	11	28.9%
Nephrology	2	5.3%
Neurology	2	5.3%
Neurosurgery	3	7.9%
Registered Nurse	3	7.9%
Surgery	3	7.9%
Tx Coordination	9	23.7%

Table 9. Professional Training on Organ Donation Program. Participants' final results, profiles and specialties. Blanks were left where information was not provided.

Table 10 summarizes the profile of the participants who attended the Organ Donation Quality Management course and lectures evaluation.

Participants profile (n=23)		
Gender (M/F)	**n**	%
Austria	1	4%
Bulgaria	1	4%
Cyprus	1	4%
Estonia	1	4%
Germany	3	13%
Greece	2	9%
Italy	2	9%
Lithuania	1	4%
Poland	3	13%
Portugal	1	4%
Romania	2	9%
Slovenia	1	4%
Slovak Republic	1	4%
Sweden	1	4%
Turkey	2	9%
Academic background	**n**	**%**
Physician	15	65%
Nurse	5	22%
Economist	2	9%
Management	1	4%
Professional Position	**n**	**%**
Transplant Coordination	7	30%
Director	4	17%
Consultant	3	13%
Others	9	39%
Lecture evaluation		
Contents	Presentation	Questions answered
4,25	4,27	4,31

ODTaSE

Within the second study the following results were obtained:

Out of the total of subjects contacted, 1102 participants (16.1%) agreed to take the survey. Of those who completed the survey, 890 respondents (80.8%) provided information about their participation in training processes, and 794 participants (72.1%) reported still being active in donation. Of those that reported gender, 252 were male (42%) and 355 were female (58%).

Eighty-seven percent of participants reporting position at the time of training consisted of as following: 306 (41%) medical doctors (MDs), 318 (42%) registered nurses (RNs), 23 (3%) non-medical PhD, 12 (2%) biologists, 4 (1%) lab technicians, and 5 (1%) social workers. Other positions reported (13%) were non-MD/RN-organ donor/transplant coordinators (n = 23), psychologists, hospital director, paramedics, quality control, and positions in tissue banks.

Respondents reported participating in 1498 training courses in 46 countries, with many respondents reporting participating in multiple courses. Participants were from 46 countries, with the most participants responding from Italy (n = 349), Spain (n = 173), France (n = 132), Portugal (n = 47), Brazil (n = 38), Turkey (n = 19), Lebanon (n = 10), and Panama (n = 10).

Eighty-seven percent (n = 910) of respondents reported participating in a TPM course (45% attended TPM training programs only whereas 42% reported to have participated in TPM and other training programs) and 9% in non-TPM courses. Forty-seven respondents (4%) indicated they had not participated in any training courses and were not included in further responses.

Eighty-three percent of respondents selected TPM courses as their most influential and 17% selected other training programs. Thus, even though 42% of individuals who participated in TPM courses participated in non-TPM trainings as well, 95% of individuals who had taken a TPM course found TPM courses the most influential.

The perceived influence of specialized training programs on career, collaboration, and skills and ability in D&T (RQ1) is shown in Table 11.

Table 11. Influence of Specialized Donation/Transplantation Training Programs for all participants who answered the survey items regardless of which training they selected as being most influential. (n= total number of respondents to each item; Score on a scale from 1 to 5: 1- no influence, 2 – very little influence, 3 – some influence, 4 – moderate amount of influence, 5-great deal of influence: data expressed as mean ±: standard deviation).

	n	Percentage of respondents that reported some to a great deal of influence	Score
Respect from peers	674	69%	3.22 ± 0.45
Advantages in promotions	677	46%	2.46 ± 0.15
Technical skills for donation/transplantation	690	93%	4.15 ± 0.96
Knowledge of donation/transplantation	698	98%	4.45 ± 1.24
Networking ability	679	84%	3.63 ± 0.60
Attitude toward donation/transplantation	690	89%	4.08 ± 0.97
Motivation to work in donation/transplantation	695	92%	4.23 ± 1.14
Collaborative opportunities for donation/transplantation	688	83%	3.75 ± 0.71
Ability to change practices for donation/transplantation	686	87%	3.85 ± 0.74
Ability to change policies for donation/transplantation	671	79%	3.51 ± 0.54
Desire to innovate for donation/transplantation	687	91%	3.98 ± 0.82
Communication skills for donation/transplantation	694	78%	4.14 ± 0.96

Given the small number selected for some training programs other than TPM as being most influential, only TPM trainings were selected for analysis of RQ2.

Males reported greater influence of trainings than females on "respect from peers" (Males: 3.4±1.5; females: 3.0±1.4; p=.025) and "networking ability"

(males: 3.8±1.2; females: 3.4±1.1; p=0.033) across all TPM trainings. No effect of gender was found in other items analysis.

There were significant effect of Position at time of training on "technical skills for D&T" (p=.001), "knowledge of D&T" (p=.029), "attitude toward donation" (p=.002), "motivation to work in D&T" (p=<.001), "collaborative opportunities" (p<.001), "ability to change practice" (p<.001), "ability to change policy" (p=.004), "desire to innovate" (p=.006) and communication skills (p=.001) (Table 12).

MDs report the highest influence on most of the items listed such as: attitude toward donation, motivation to work in D&T, ability to change practice and ability to change policy. Apart from MDs, RNs and social workers perceived the trainings to have the most influence on "ability to change policy" and "motivation to work" in D&T. Social workers reported the most "collaborative opportunities". However, lab technicians and biologists reported the lowest levels of perceived influence on all the above mentioned items (Table 12).

Table 12. Effect of "position at time of training" on perceived influence over technical skills, knowledge about donation and transplantation (D&T), attitude toward D&T, motivation to work in D&T, collaborative opportunities, ability to change practice, ability to change policy, on desire to innovate, communication skills. (Scored on a scale from 1 to 5: 1- no influence, 5-great deal of influence). Data expressed as: Mean± Standard Error.

What was your position at time of training?	Technical skills for D&T	Knowledge of D&T	Attitude toward D&T	Motivation to work in D&T	Collaborative opportunities	Ability to change practice	Ability to change policy	Desire to innovate	Communication skills
MD	4.4±0.2	4.6±0.1	4.4 ±0.2	4.4±0.2	3.9±0.2	4.3±0.2	3.9±0.2	4.1±0.2	4.6±0.2
RN	4.4±0.2	4.6±0.1	4.3 ±0.2	4.5±0.2	3.9±0.2	4.1±0.2	3.7±0.2	4.2±0.2	4.3±0.2
LabTechnician	3.0±0.7	3.0±0.5	2.0±0.8	3.0±0.7	2.0±0.8	1.5±0.7	1.5±0.8	2.5±0.7	2.5±0.7
Biologist	2.8±0.3	3.8±0.3	2.8±0.4	2.7±0.4	1.8±0.4	2.1±0.4	2.1±0.4	2.8±0.4	2.6±0.3
Social Worker	4.8±0.6	4.5±0.4	4.3±0.6	4.8±0.6	4.5±0.7	4.0±0.6	3.8±0.7	4.0±0.6	4.5±0.6
Non-medical Ph.D.	4.2±0.3	4.4±0.2	3.8±0.3	4.1±0.3	3.5±0.4	3.8±0.3	3.4±0.4	3.5±0.3	4.2±0.3
Other	4.4±0.2	4.7±0.2	4.0±0.3	4.2±0.2	3.9±0.3	4.0±0.3	3.9±0.3	4.2±0.2	4.3±0.2
P value	p=.001	p=.029	p=.002	p=<.001	p<.001	p<.001	p=.004	p=.006	p=.001

Type of training showed a significant effect on "advantages in promotion" (p=.033) with OL, BL, TPM Masters courses offering the most perceived benefit and "essentials in organ donation" and "introductory F2F" offering the least perceived benefit (Table 13).

TPM Masters/international	2.9±.2
F2F Advanced	2.7±.2
F2F Intermediate	2.6±.4
F2F Introductory	2.1±.3
All blended trainings	3.0±.5
All online trainings	3.3±.5
Essentials in organ donation seminar	2.0±.5
	(p=.033)

Table 13. Effect of "type of training" (Highest course taken) on perception about "advantages in promotion". (Scored on a scale from 1 to 5: 1- no influence, 5-great deal of influence). Data expressed as: Mean± Standard Error

A significant interaction effect with Position at time of training and Type of training on "respect from peers" (p=.022) and "advantages to promotion" (p=.011) was reported (Table 14). MD perceived more benefit on "advantages to promotion" from TPM Masters/International course than RNs did. Nevertheless, MD and RN found the advanced trainings less beneficial than the "Other" category did.

Significant interaction effect with Position at time of training and Type of training were also reported on "networking ability" (p=.017). MD and non-medical Ph.D. report higher levels of networking ability in TPM Masters/International courses, but slightly lower than RN and social workers in the advanced courses.

Finally, significant interaction effects with Position at time of training and Type of training were further reported on "collaborative opportunities" (p=.033), with MD reporting the highest collaborative opportunities in the TPM Masters/International course, and RN and social workers in the advanced F2F training (Table 14).

Table 14. Influence of type of course (Highest TPM course taken) and position at time of training on respect from peers, advantages to promotion, networking ability & collaborative opportunities. (Scored on a scale from 1 to 5: 1- no influence, 5-great deal of influence). Data expressed as: Mean± Standard Error. Not all positions were represented in each training type.

	What was your position at time of training?	Respect from peers	Advantages in promotion	Networking ability	Collaborative opportunities
TPM Masters/international	MD	3.7±0.2	3.0±0.2	4.0±0.2	4.3±0.2
	RN	2.6±0.3	2.0±0.3	3.3±0.2	3.9±0.2
	Biologist	4.0±0.7	3.5±0.7	3.0±0.5	2.3±0.6
	Other	2.0±0.7	2.8±0.7	3.5±0.5	2.8±0.6
	Ph.D.	3.3±0.7	3.3±0.7	4.0±0.5	3.4±0.5
F2F Advanced	MD	3.0±0.2	2.2±0.2	3.7±0.1	3.7±0.1
	RN	3.5±0.2	2.7±0.2	3.8±0.1	4.1±0.1
	Biologist	2.5±0.7	2.5±0.7	3.5±0.5	3.0±0.6
	Social Worker	4.5±1.0	3.0±1.0	4.0±0.7	5.0±0.8
	Other	3.7±0.3	3.4±0.3	4.0±0.2	4.1±0.2
	Ph.D.	2.3±0.8	2.7±0.8	5.0±0.6	2.3±0.7
F2F Intermediate	MD	3.5±0.3	2.9±0.3	3.9±0.2	3.8±0.2
	RN	3.0±0.3	2.3±0.3	3.5±0.2	3.6±0.2
	Biologist	1.0±1.4	1.0±1.4	3.0±1.1	1.0±1.2
	Other	3.3±0.7	2.8±0.7	3.5±0.5	4.3±0.6
	Ph.D.	4.0±1.4	4.0±1.4	4.0±1.1	4.0±1.2
F2F Introductory	MD	3.3±0.3	2.5±0.3	4.1±0.2	4.1±0.2
	RN	3.4±0.2	2.3±0.2	3.7±0.2	4.0±0.2
	Social Worker	2.0±1.4	2.0±1.4	4.0±1.1	4.0±1.2
	Other	3.5±0.7	2.3±0.7	3.3±0.5	3.0±0.6
	Ph.D.	2.8±0.7	1.5±0.7	2.0±0.5	2.5±0.6
All blended trainings	MD	3.4±0.6	3.0±0.6	3.8±0.5	3.4±0.5
	RN	3.4±0.5	3.0±0.5	3.4±0.4	3.9±0.4
	Other	4.0±1.4	3.0±1.4	5.0±1.1	5.0±1.2
All online trainings	MD	5.0±1.4	5.0±1.4	5.0±1.1	5.0±1.2
	RN	5.0±1.4	5.0±1.4	5.0±1.1	5.0±1.2
	Lab Technician	3.0±1.0	1.5±1.0	2.0±0.7	2.0±0.8
	Biologist	2.5±1.0	1.0±1.0	2.5±0.7	1.0±0.8
	Other	3.7±0.4	3.3±0.4	3.2±0.3	3.5±0.4
	Ph.D.	3.0±1.4	4.0±1.4	3.0±1.1	4.0±1.2
Essentials in organ donation seminar	MD	2.0±0.8	1.0±0.8	3.7±0.6	3.0±0.7
	RN	2.1±0.4	1.8±0.4	3.3±0.3	3.2±0.3
	Other	2.0±1.4	1.0±1.4	4.0±1.1	5.0±1.2
	Ph.D.	4.0±1.4	4.0±1.4	5.0±1.1	5.0±1.2
P value		p=.022	p=.011	p=.017	p=.033

Chapter 4. Discussions

To conclude, **Hypothesis 1. "Increased awareness, knowledge, commitment and skills provided through education among health care professionals impact positively the organ donation activity and its parameters**" is correct.

ETPOD was a successful training program by having created quality educational materials with the support of the project participating organizations and the recognition of the European Commission through its 'Action Plan on Organ Donation and Transplantation (2009–2015)'. It resulted in identifying the educational needs of healthcare professionals involved in organ donation and implementing effective training programs with a positive impact upon donation parameters.

To improve donation rates and overcome organ shortage, a multifactor approach (European Commission, 2006) is required, tackling various aspects such as social, legal, and medical. However, specialized training of professionals active in the field of organ donation and transplantation proved its efficacy in organ donation.

For the first time, a needs analysis was carried out. On its basis an efficient educational initiative was developed and implemented at large scale, reaching out health care professionals involved in the various stages of the organ donation process.

While 51 participants attended the Training for Trainers, 49 the Professional Training on Organ Donation, and 23 participants attended the Organ Donation Quality Managers, the EOD seminars reached out 3163 participants. The training program covered different important professional profiles as following: Healthcare professionals in targeted donor units, such as Intensive Care, Postoperative Recovery and Emergency Room departments; Healthcare

professionals in charge of managing the whole organ donation process, those owing to join a Transplant Coordination Office and Key Donation Professionals wishing to update their knowledge and reinforce their competences as well as Donor program managers responsible for national, regional, local, and/or hospital organizations with high activity in organ recovery and transplantation.

Several limitations to the study have been identified while analyzing the project results. TAs profiles did not reveal homogeneous results. They differed in population size, health care system (expressed as number of hospitals involved, number of ICU beds, etc.), legislation, organ donation organizational structure and resources, etc., which may explain why the initial results and data evolution varied significantly between TAs.

A further proactive search shall be carried out to identify whether organ donor coordinators work full time or part time, inside ['Action Plan on Organ Donation and Transplantation (2009–2015)'] or outside donor hospitals, whether these professionals cover one or more hospitals with organ donation potentiality, what their background is, whether they have been trained and what type of support acquire from upper structures involved in organ donation. In general terms, it has been suggested that an increased number of coordinators could improve the rate of organ donors in a given area (Matesanz, 2004). For this reason, we considered important to include this parameter in the study. It is interesting though to remark that the increase in donation rates was not because of a higher number of coordinators in the TAs.

We consider that the increased awareness, commitment, knowledge, and skills of the professionals involved in the study could explain better results, despite a reduced number of coordinators.

Moreover, it is possible that the different TAs put unequal effort into replicating the training programs despite the special attention paid during study participants' selection. However, we did not find any correlation between the

course results (scores) reported and the outcome in terms of number of donors detected or organs recovered. In this regard, the evaluation of any of the training programs developed and its correlation with the training applicability remains unresolved.
On the other side, TAs are not necessarily representative for their countries. It means that results cannot be extrapolated to other areas than the ones assessed. However, considering the different sizes and profiles of TAs, this educational initiative seems feasible for regions and countries of different sizes, with diverse structure and investment in health.

Such a high impact on organ donation parameters proves the effectiveness of the ETPOD training program. After the official closure of the project, participants from 22 countries, belonging to the European Transplant Network and the Mediterranean Transplant Network, benefitted from the *Essentials in Organ Donation* training program. New TAs were established and EOD seminars carried out. Educational materials were further translated and adapted to the local context and professional needs of new countries involved. A database was created (http://www.etpod-dissemination.eu) to follow up EOD seminars and their impact on organ donation. More than 152 EOD seminars were carried out and 7836 healthcare professionals from 17 different countries from Africa, America, and Europe were trained.

Further improvements were suggested concerning the identification and use of clinical indicators to establish baseline performance and assess the effectiveness of proposed quality improvements (Council of Europe, 2006; Procaccio, Rizzato, Ricci & Venettoni, 2008), the extension of educational programs in organ donation, and the homogenization of results in Europe and worldwide.

The predictions of **Hypothesis 2. "Specialized training programs such as TPM have positive perceived benefits in the areas of career, collaboration, skills and ability in organ donation**" are also correct.

ODTaSE proved that TPM specialized training programs in D&T had positive effects for a significant percentage of D&T related health care workers on professional competence development and career evolution. This may be explained by the ongoing effort of TPM to improve its products and services in compliance with the agreed professional requirements, and provide increased efficiency and quality over time.

TPM training programs have many advantages beyond the traditional measures of increasing knowledge of a specific practice. Well-designed programs provide certifications and prestige that are likely to result in increased respect from peers, advantages in promotions. These programs result in improvement in technical skills and knowledge, as well as the ability to communicate effectively about D&T. Additionally, they bring together people who have similar interests who are likely to become influential in their fields, and thus increases networking ability and collaborative opportunities as well. Furthermore, having well designed programs taught using innovative approaches by passionate faculty (Shafer et al., 2006) increases motivation to work in transplantation and the desire to innovate in D&T. Many participants act on these motivations and report that the trainings are influential in their ability to change policy and practice related to D&T, collaborative opportunities, ability to change policies and practices, desire to innovate, and communication skills related to D&T.

Literature research reveals that similar studies were conducted in different medical fields. In Toronto, Canada, a study was performed to examine how inter-professional education (IPE) clinical placement influences health care students' perceptions of inter-professional collaboration (IPC). Findings suggest that structured IPE clinical placements may provide students with valuable collaborative learning opportunities, enhanced respect for other professionals, and insight into the value of IPC in healthcare delivery (Pinto et al., 2012). The results of another study, conducted by The American Medical

Association (AMA) to evaluate changes in practice behaviours, suggested that a well-designed education intervention can enhance health professional confidence and clinical practice (Meuser, Carr, Irmiter, Schwartzberg & Ulfarsson, 2010).

However, not all types of trainings had the same outcomes for all participants, although most training still received high evaluations. These differences are important to note in terms of evaluating overall success and for consideration of who is likely to benefit most from a certain type of training. It appears that overall D&T was still a bit of a male-dominated field (Delgado, Saletti-Cuesta, López-Fernández, de Dios Luna, & Mateo-Rodriguez, 2011) and female participants were less likely to feel the same influence of trainings on respect from peers. Additionally, it is a bit surprising that BL and OL trainings are reported to have more of an influence on promotions than the F2F courses only. There are a couple of possible explanations for this. First, the overall numbers of participants in these categories was significantly lower than for the TPM Masters/International and the TPM Advanced F2F courses. Moreover, in the Masters and Advance course, the majority of respondents were RNs and MDs. Thus, it may be less common for an MD or RN to report a specific type of promotion.

Overall, this report provided a new type of evaluation of training programs that went beyond rating the quality of the course or instructors, and focused specifically on how different groups perceived the benefits of the trainings in their ongoing work life. Generally, MDs reported the greatest influence of the trainings on improving their attitudes toward D&T. MDs also reported more influence of the trainings on their ability to change policies and practices related to D&T. However, in many categories RNs, and social workers also reported high levels of influence of the trainings on their ability to change policy and practice as well. Lab technicians and biologists seemed to perceive less benefit from the trainings than did medical professionals, social workers and others.

The survey was developed together with experts from UB, Spain, and Brian Lamb School of Communication, PU, USA, considering the accuracy and consistency of our measurements. It was further revised, readjusted, translated and validated by experts in organ D&T. Piloting and pretesting was also performed to increase both validity and reliability of the survey, and finally, the survey was approved by the IRBs of UB, Spain, and PU, USA. It conferred validity and reliability to the survey results.

However, we should also consider some limitations of the study.

A degree of caution should be taken in interpreting the data for biologists, lab technicians, and social workers, especially when broken out by type of training as the number of participants in a given course for each category might be very low. Moreover, while OL courses seemed more influential to MDs and RNs, there was a low sample size for these cells, making interpretation more difficult.

Last, the study focused on the perceived benefits from the trainings on career, collaboration, and skills and ability in D&T and not on the actual impact of the trainings on the different items. However, previous findings showed that the educational initiatives undertaken by TPM along with the consortium partners and the support of the European Commission within the ETPOD project were successful and facilitated significant increase in organ donation figures.
The data collected will allow future evaluations focusing on issues like networks and collaboration, success in changing policy and practice, career advancement and committees, etc.

References

1. Abouna, G.M. (2008). Organ shortage crisis: problems and possible solutions. Transplant Proceedings,40: 34.
2. Advocate Research and Innovation Forum 2012. Continuous Improvement Methodology-PDCA. Retrived from: http://www.advocatehealth.com/documents/research/06%20Lipp%20Haussen_PDCA_Presentation.pdf
3. Alexander S. and Boud D. (2001). Learners still learn from experience when online. In Stephenson, J. (Ed), Teaching and Learning Online: Pedagogies for New Technologies, Kogan Page, London.
4. Aulisio, M.P., Devita, M., Luebke, D. (2007). Taking values seriously: ethical challenges in organ donation and transplantation for critical care professionals. Critical Care Medicine, 35 (Suppl. 2):S95.
5. Bernat, J.L. (2006). Report of a National Conference on Donation after Cardiac Death. American Journal of Transplantation; 6:281-91.
6. Boud, D., Cohen, R. and Walker, D. (1993). Understanding learning from experience, in Boud, D., Cohen, R. and Walker, D. (Eds.) Using Experience for Learning, SRHE and Open University Press, Buckingham, 1-17.
7. Bruzzone P. (2008). Religious aspects of organ transplantation. Transplantation Proceedings, 40: 1064.
8. Commission of the European Communities (2008). Communication from the Commission: Action plan on Organ Donation and Transplantation (2009-2015): Strengthened Cooperation between Member States, available at http://ec.europa.eu/health/ph_threats/human_substance/oc_organs/docs/organs_action_en.pdf.
9. Committee of Ministers Resolution (1978) 29 on harmonisation of legislation of member states relating to removal, grafting and transplantation of human substances. Retrieved from: www.coe.int/t/dg3/healthbioethic/texts_and_documents/Res(78)29E.pdf

10. Council of Europe (1950). Convention for the Protection of Human Rights and Fundamental Freedoms, available at http://www.echr.coe.int/Documents/Collection_Convention_1950_ENG.pdf
11. Council of Europe (1997). Convention for the protection of human rights and dignity of the human being with regard to the application of biology and medicine: Convention on Human Rights and Biomedicine, available at http://conventions.coe.int/Treaty/en/Treaties/Html/164.htm
12. Council of Europe (2002). Additional Protocol to the Convention on Human Rights and Biomedicine concerning Transplantation of Organs and Tissues of Human Origin. Retrieved from: http://conventions.coe.int/Treaty/en/Treaties/Html/186.htm
13. Council of Europe (2003). Organ Shortage: Current Status and Strategies for the Improvement of Organ Donation – A European Consensus Document, available at www.edqm.eu/medias/fichiers/Organ_shortagecurrent_status_and_strategies_for_improvement_of_organ_donation_A_European_consensus_document.pdf
14. Council of Europe (2005). Council of Europe Convention on action against trafficking in human beings, available at http://conventions.coe.int/Treaty/EN/Treaties/Html/197.htm
15. Council of Europe (2006). Recommendation (Rec (2006)16) on quality improvement programmes for organ donation. Available at: https://wcd.coe.int/wcd/ViewDoc.jsp?id=1062721&BackColorInternet=9999CC&BackColorIntranet=FFBB55&BackColorLogged=FFAC75
16. Council of Europe & Organización Nacional de Trasplantes (2015) International figures on donation and transplantation. Year 2014 Newsletter Transplant 20:34-36.
17. Delgado, A., Saletti-Cuesta, L., López-Fernández, L.A., de Dios Luna, J.de D., Mateo-Rodriguez, I. (2011). Gender and the professional

career of primary care physicians in Andalusia (Spain). *BMC Health Services Research*. Feb 28;11:51.

18. Dominguez-Gil, B., Delmonico, F., Shaheen, F.A.M. et al. (2011). The critical pathway for deceased donation: reportable uniformity in the approach to deceased donation. *Transplant International*, 24: 373.
19. Dominguez-Gil, B., Haase-Kromwijk, B., Van Leiden, H., et al (2011). Current situation of donation after circulatory death in European countries. *Transplant International,* 24: 676–686.
20. eMedicineHealth (2006). What is informed consent? Retrieved from the eMedicineHealth Web site: http://www.emedicinehealth.com/informed_consent/article_em.htm
21. ETPOD Dissemination. Available at: http://www.etpod-dissemination.eu European Commission, Directorate-General Health and Consumer Protection, Public Health and Risk Assessment Directorate, Unit C6 Health Measures (2003). Human Organ Transplantation in Europe:An Overview. Retrieved from: http://ec.europa.eu/health/ph_threats/human_substance/documents/organ_survey.pdf
22. European Commission (2006). Organ donation and transplantation, policy options at EU level. Available at: http://ec.europa.eu/health/ph_threats/human_substance/oc_organs/consultation_paper.pdf
23. European Commission (2007). The Lisbon Treaty. Article 168. Available at http://www.lisbon-treaty.org/wcm/the-lisbon-treaty/treaty-on-the-functioning-of-the-european-union-and-comments/part-3-union-policies-and-internal-actions/title-xiv-public-health/456-article-168.html
24. European Commission, Directorate-General Health and Consumer Voice (2009). Saving Lives: improving organ donation across Europe. Retrieved from the European Commission Web site: http://ec.europa.eu/dgs/health_consumer/dyna/consumervoice/create_cv.cfm?cv_id=498

25. European Commission (2012). Commission Implementing Directive 2012/25/EU of 9 October 2012 laying down information procedures for the exchange, between member states, of human organs intended for transplantation, available at http://ec.europa.eu/health/blood_tissues_organs/docs/organs_impl_directive_2012_en.pdf
26. European Commission (2014). Journalist Workshops - Organ donation and transplantation. Available at: http://ec.europa.eu/health/blood_tissues_organs/events/journalist_workshops_organ_en.htm#fragment0
27. European Directorate for the Quality of Medicines & Healthcare (2013). Guide to the quality and safety of organs for transplantation, 5th edn. European Council ISBN 978-92-871-7638-7.
28. European Network of Regions Improving Citizens' Health. Retrieved from: http://ec.europa.eu/health/ph_threats/human_substance/oc_organs/docs/oc_organs_061_en.pdf
29. European Parliament and the Council (2010). Directive 2010/53/EU of the European Parliament and of the Council of 7 July 2010 on standards of quality and safety of human organs intended for transplantation. 2010. *Official Journal of the European Union*, 53: 14-29. Retrieved from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32010L0053:EN:NOT
30. European Parliament and the Council (2010). Corrigendum to Directive 2010/45/EU. Retrieved from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:243:0068:0068:EN:PDF.
31. Eurostat (2008). http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-QA-08-026/EN/KS-QA-08-026-EN.PDF

32. Executive Agency for Health and Consumers, European Union (2013). Transplantation and Transfusion. Projects and Actions for saving and improving the quality of life of citizens by facilitating transplantation and blood transfusion in the European Union. Publications Office of the European Union.
33. Gardiner, D., Shemie, S., Manara, A. and Opdam, H. (2012). International perspective on the diagnosis of death. *British Journal of Anaesthesia*, 108 (suppl 1): i14-i28
34. Global Observatory on Donation and Transplantation, available at www.transplant-observatory.org
35. Heinich, R., Molenda, M., Russell, J., & Smaldino, S. (2003). Instructional media and technologies for learning (7a. ed.). Upper Saddle River, NJ: Pearson Prentice Hall.
36. Honey, P. and Mumford, A., (1992). Manual of learning styles, (3rd Edit), Honey, London.
37. International Registry in Organ Donation and Transplantation-IRODaT. http://www.irodat.org/.
38. Irving, M. (2012). Factors that influence the decision to be an organ donor: a systematic review of the qualitative literature. *Nephrology Dialysis Transplant*, 7: 2526–2533
39. Istrate, M.G., Harrison, T.R., Valero, R., Morgan, S.E., Páez, G., Zhou, Q., Rébék-Nagy, G., Manyalich, M. (2015). Benefits of Transplant Procurement Management (TPM) specialized training on professional competence development and career evolutions of health care workers in organ donation and transplantation. *Exp Clin Transplant*, Apr;13 Suppl 1:148-55.
40. Joint Council of Europe/United Nations (2009). Study on trafficking in organs, tissues and cells and trafficking in human beings for the purpose of the removal of organs. Retrieved from: http://www.coe.int/t/dghl/monitoring/trafficking/docs/news/organtrafficking_study.pdf

41. Kaminski, A., Uhrynowska-Tyszkiewicz, I., Miranda, B., Navarro, A., Manyalich, M. (2007). Design and validation of a specialized training model for tissue bank personnel as a result of the European Quality System for Tissue Banking (EQSTB) project. *Transplantation Proceedings*, Nov;39(9):2698-700.
42. Knowles, M. S. (1971). The modern practice of adult education: andragogy versus pedagogy. Nova York: Association Press.
43. Kolb, D. A. (1984). Experiential Learning: experience as the source of learning and development. Englewood Cliffs, New Jersey: Prentice Hall;
44. Madrid Resolution on Organ Donation and Transplantation (2011). *Transplantation*, Volume 91, Number 11S, available at http://digicollection.org/hss/documents/s19228en/s19228en.pdf
45. Manara, A.R. et al. (2012) Donation after circulatory death. *British Journal of Anaesthesia,*108 (S1):i108-i121.
46. Manyalich, M. et al. (2009). European quality system for tissue banking. *Transplantation Proceedings*, Jul-Aug; 41(6):2035-43.
47. Manyalich, M., Guasch, X., Paez, G., Valero, R., Istrate, M. (2013). ETPOD (European Training Program on Organ Donation): a successful training program to improve organ donation. *Transplant International*, Apr; 26(4):373-84.
48. Manyalich, M., Valero, R., Paez, G., Balleste Delpierre, C., Sandiumenge, A. (2014). Transplant Procurement Management: TPM. Organisational model for the generation of donors. In *Transplant Coordination Manual* (pp.13-20). Transplant Procurement Management
49. Mason, R. (1998) Models of Online Courses, *ALN Magazine*, Vol 2.2, October.
50. Matesanz, R., Miranda, B. (2002) A decade of continuous improvement in cadaveric organ donation: the Spanish model. *Journal of Nephrology*, 15: 22.

51. Matesanz R. (2003). Factors influencing the adaptation of the Spanish model of organ donation. *Transplant International* 16:736
52. Matesanz R. (2004). Factors that influence the development of an organ donation program. Transplantation Proceedings, 36, 739–741.
53. Matesanz, R., Dominguez, B. (2007). Strategies to optimize deceased organ donation. *Transplant Reviews*, 21:177.
54. Matesanz R. (2011). Spanish experience as a leading country: what kind of measures were taken? *Transplant International*, 24:333-43.
55. Meuser, T. M., Carr, D. B., Irmiter, C., Schwartzberg, J. G.,.Ulfarsson, G. F. (2010). The American Medical Association Older Driver Curriculum for Health Professionals: Changes in Trainee Confidence, Attitudes & Practice Behavior. *Gerontology& Geriatrics Education*. October; 31(4): 290–309.
56. Mollaret, P., Goulon, M. (1959). Le coma dépassé (mémoire préliminaire). *Revue neurologique* (Paris), 101:3-5.
57. Mossialos, E., Costa-Font, J., Rudisill, C. (2008). Does organ donation legislation affect individuals' willingness to donate their own or their relative's organs? Evidence from European Union survey data. *BMC Health Services Research*, 27: 48.
58. NOTIFY Library, available at www.notifylibrary.org
59. Nuffield Council on Bioethics (2011). Human bodies: donation for medicine and research. Nuffield Council on Bioethics, London, United Kingdom, Retrieved from: www.nuffieldbioethics.org/sites/default/files/Donation_full_report.pdf
60. Organización Nacional de Trasplantes (2014). Annual report. www.ont.es. http://www.ont.es/infesp/Memorias/Memoria%20donantes%202014.pdf
61. Paez, G., Valero, R., Paredes, D., Navarro, A., Trias, E., Ruiz, A., Cabrer, C., Manyalich, M. (2003). Evaluation of transplant procurement management courses: an educational project as a tool

for the optimization of transplant coordination. *Transplantation Proceedings*, Aug; 35(5):1638-9.

62. Paez, G., Valero, R., Manyalich, M. (2009). Training of health care students and professionals: a pivotal element in the process of optimal organ donation awareness and professionalization. *Transplantation Proceedings*, Jul-Aug; 41: 2025-9.
63. Pinto, A., Lee, S., Lombardo, S.,Salama, M., Ellis, S., Kay, T., Davies, R., Landry, M. D. (2012). The Impact of Structured Inter-professional Education on Health Care Professional Students' Perceptions of Collaboration in a Clinical Setting. *Physiotherapy Canada*. Spring; 64(2): 145–156.
64. Procaccio, F., Rizzato, L., Ricci, A., Venettoni, S. (2008). Indicators of efficiency in potential organ donor identification: preliminary results from the national registry of deaths with acute cerebral lesions in Italian intensive care units. *Organs, Tissues and Cells*; 2: 125.
65. Reich, D.J. (2009). ASTS Recommended Practice Guidelines for Controlled Donation after Cardiac Death Organ Procurement and Transplantation. *American Journal of Transplantation*; 9(9): 2004-2011.
66. Reigeluth, C. M. (1999a). The elaboration theory: guidance for scope and sequence decisions? In C. M. Reigeluth (Ed.), Instructional-design theories and models. Vol. II: A new paradigm of instructional theory (pp. 427-453). *Nova Jersey: Lawrence Erlbaum*.
67. Reigeluth, C. M. (1999b). What is instructional-design theory and how is it changing? In C. M. Reigeluth (Ed.), Instructional-design theories and models. Vol. II: A new paradigm of instructional theory (pp. 5-29). Nova Jersey: Lawrence Erlbaum.
68. Roels, L., Cohen, B., Gachet, C., Miranda, B.S. (2002). Joining efforts in tackling the organ shortage: The Donor Action experience. *Clinical Transplantion*, 111.

69. Roels, L., Spaight, C., Smits, J., Cohen, B. (2009). Critical Care staff attitudes to organ donation impact on national donation rates: data from the Donor Action database. *Critical Care*; 13 (Suppl. 1): P79.
70. Russell, C.L, Van Gelder, F. (2008). An international perspective: job satisfaction among transplant nurses. *Progress in transplantation*, Mar;18(1):32-40.
71. Saidi, R.F. (2007). Outcome of kidney transplantation using expanded criteria donors and donation after cardiac death kidneys: Realities and costs. *American Journal of Transplantation,* 7: 2769–2774.
72. Salim, A., Berry, C., Ley, E.J. et al. (2011). In-house coordinator programs improve conversion rates for organ donation. *Journal of Traumatology*, 71(3): 733.
73. Shafer, T. J., Wagner, D., Chessare, J., Zampiello, F. A., Macbride, V., Perdue, J. (2006). Organ donation breakthrough collaborative: increasing organ donation through system redesign. *Critical Care Nurse*, 26, 33-42.
74. Schon, D.A. (1983). The Reflective Practitioner, Basic Books, New York.
75. Shemie, S.D. (2006). Donation after cardiocirculatory death in Canada. *CMAJ* 2006; 175:S1-S24.
76. Steering Committee of the Istanbul Summit (2008). Organ trafficking and transplant tourism and commercialism: the Declaration of Istanbul. *The Lancet* 372: 5-6. See also: The Declaration of Istanbul Custodian Group (2008): The Declaration of Istanbul on Organ Trafficking and Transplant Tourism. Retrieved from: www.declarationofistanbul.org/index.php?option=com_content&view=article&id=73&Itemid=59
77. Stephenson, J. and Sangrà, A. Modelos pedagógicos y e-learning. Universitat Oberta de Catalunya. Retrieved from: http://www.slideshare.net/eraser/modelos-pedagogicos-y-e-learning-12991105

78. Stewart, T. A. (1997). Intellectual Capital - The New Wealth of Organisation, New York: Doubleday/Currency
79. Taylor, G., Mcgaw, J. (1998). Determining preferred educational methods for neurological surgery residents regarding organ donation. *Journal of Transplant Coordination*, 8:30-2.
80. The Hungarian National Blood Transfusion Service. Available at http://www.ovsz.hu/oco/cimlap
81. Transplant Procurement Management - Donation and Transplantation Insitute. Training. http://tpm-dti.com/en-training/
82. Uryuhara, Y., Hasegawa, T., Takahashi, K. et al. (2004). Approaches to solve organ shortage in European countries. *Ishoka,*38:145.
83. U.S. National Library of Medicine. MedlinePlus. Available at: https://www.nlm.nih.gov/medlineplus/organtransplantation.html
84. Vandewaetere ,M., Manhaeve, D., Aertgeerts, B., Clarebout, G., Van Merriënboer, J.J., Roex, A. (2015). *Med Teach*., Jan;37(1):4-20
85. Van Gelder, F., de Roey, J., Desschans, B., Van Hees, D., Aerts, R., Monbaliu, D., De Pauw, L., Coosemans, W., Pirenne, J. (2008). What is the limiting factor for organ procurement in Belgium: donation or detection? What can be done to improve organ procurement rates? *Acta Chirurgica Belgica*, Jan-Feb;108(1):27-30.
86. Van Merriënboer, J. J. G. & Dijkstra, S. (1997). The four-component instructional design model for training complex cognitive skills. In R. D. Tennyson, F. Schott, N. Seel & S. Dijkstra (Eds.), Instructional design: international perspectives. Vol. I: Theory, research, and models (pp. 427-445). Mahwah, Nova Jersey: Lawrence Erlbaum.
87. Wakefield, M.A., Loken, B., Hornik, R.C. (2010). Use of mass media campaigns to change health behaviour. *Lancet*; 376:1261.
88. Wenger E. (1998). Communities of practice: learning, meaning, and identity. Cambridge University Press.
89. Williams, P., Schrum L., Sangrà A., Guàrdia, L.. Modelos de diseño instruccional, Universitat Oberta de Catalunya. Retrieved from:

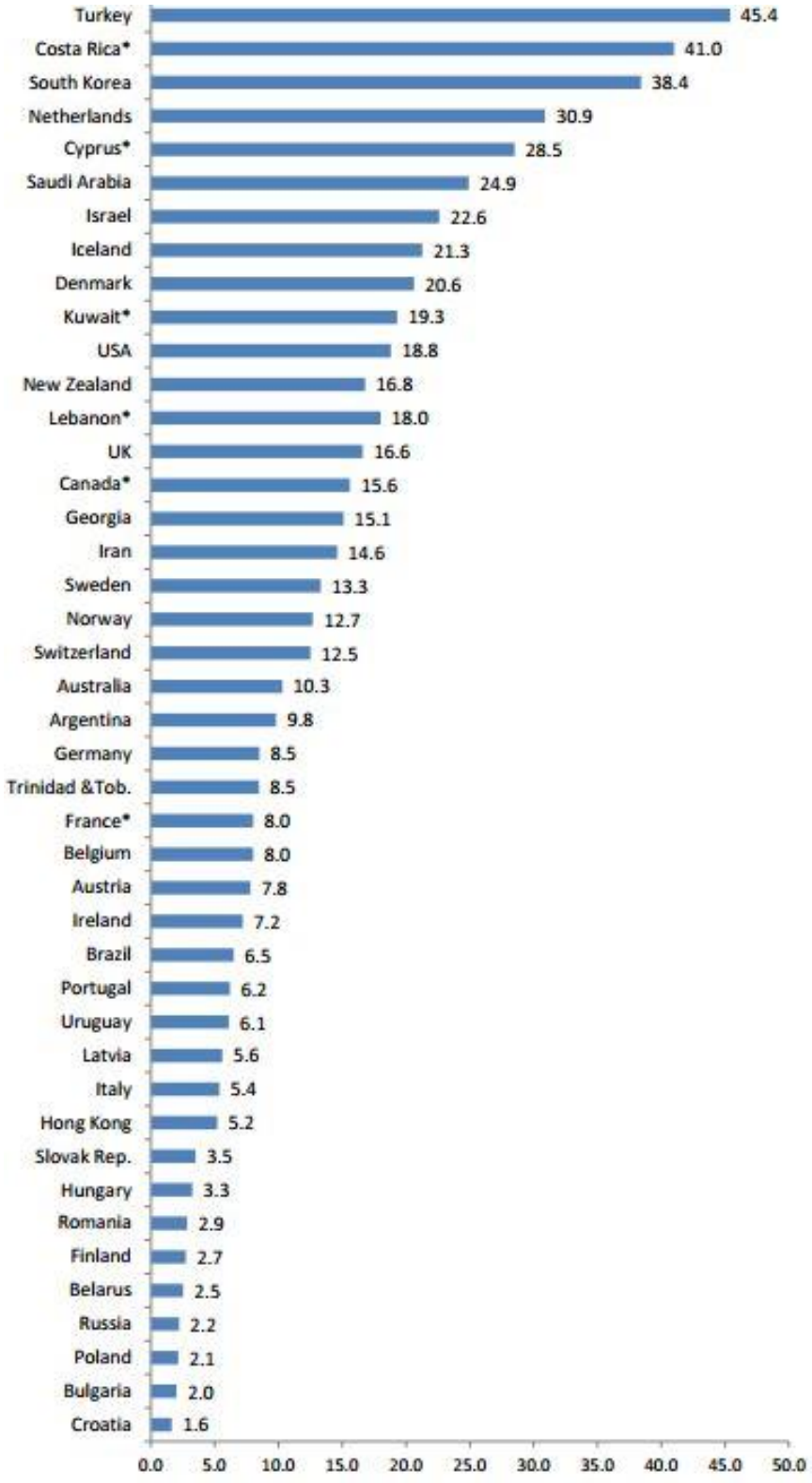
http://aulavirtualkamn.wikispaces.com/file/view/2.+MODELOS+DE+DISE%C3%91O+INSTRUCCIONAL.pdf

90. World Health Assembly (1991). Human organ transplantation: WHA44.25, available at http://www.transplant-observatory.org/SiteCollectionDocuments/wha44resen.pdf
91. World Health Assembly (2004). Human organ and tissue transplantation: WHA57.18. Retrieved from: http://apps.who.int/gb/ebwha/pdf_files/WHA57/A57_R18-en.pdf
92. World Health Assembly (2010). Human organ and tissue transplantation: WHA63.22. Retrieved from: http://apps.who.int/gb/ebwha/pdf_files/WHA63/A63_R22-en.pdf
93. World Health Organization (2009). Global Glossary of Terms and Definitions on Donation and Transplantation. Retrieved from: https://www.edqm.eu/sites/default/files/who_global_glossary_on_donation_transplantation_geneva_2009.pdf
94. World Health Organization (2010) WHO Guiding principles on human cell, tissue and organ transplantation. Retrieved from: www.who.int/transplantation/Guiding_PrinciplesTransplantation_WHA63.22en.pdf
95. World Health Organization (2011). Third WHO Global Consultation on Organ Donation and Transplantation. Striving to achieve self-sufficiency, March 23–25, 2010, Madrid, Spain. *Transplantation*, 91 (Suppl.11): S27
96. World Health Organization. Data and statistics http://www.euro.who.int/en/health-topics/noncommunicable-diseases/diabetes/data-and-statistics
97. http://www.britannica.com/topic/organ-donation (last review 29 April, 2016)
98. http://www.nobelprize.org/nobel_prizes/medicine/laureates/1912/ (last review 8 December, 2013)
99. http://www.nobelprize.org/nobel_prizes/medicine/laureates/1960/ (last review 8 December, 2013)

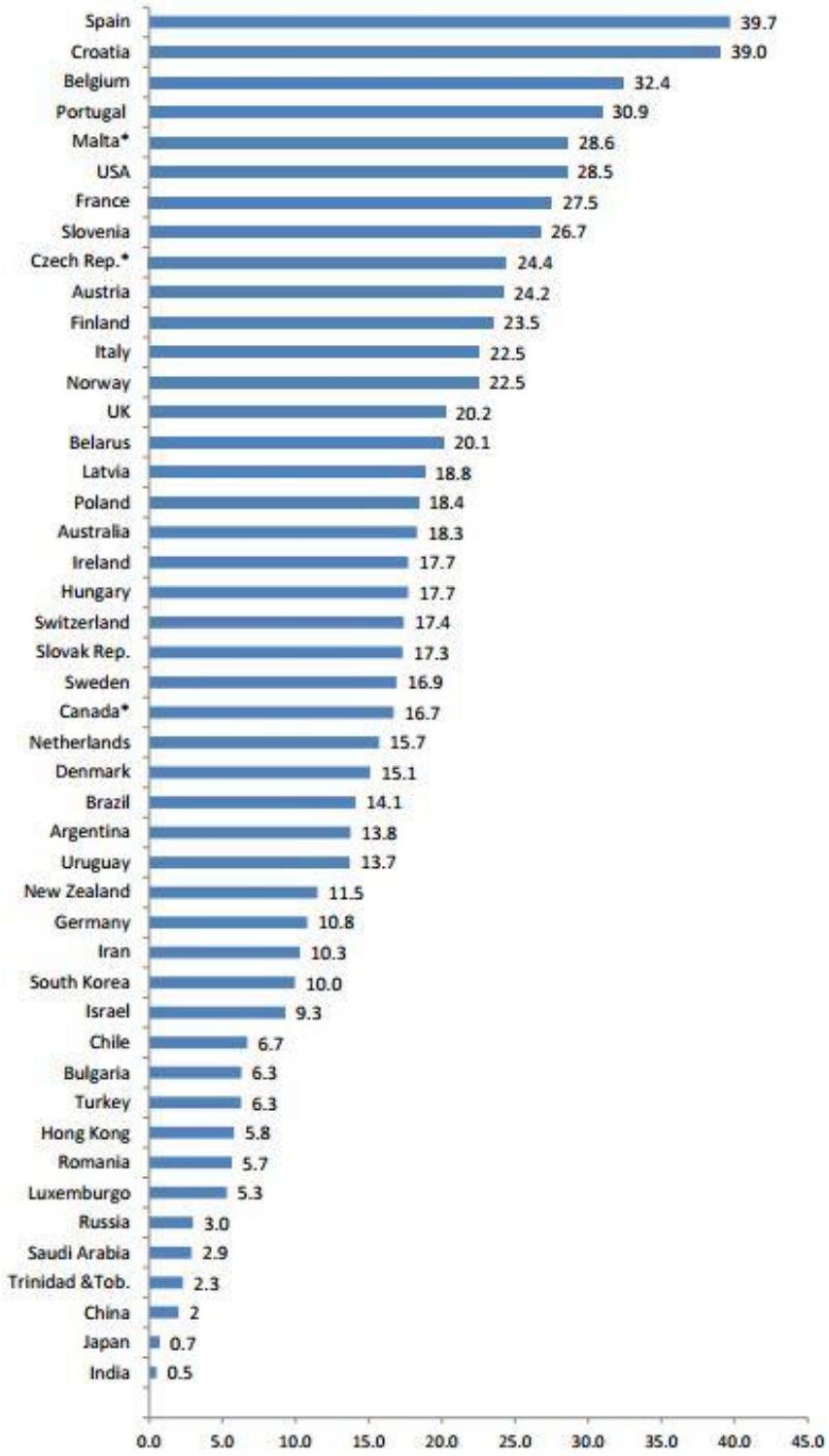
100.http://www.foedus-ja.eu/partners/7-orszagos-verellato-szolgalat-ovsz (last review 29 April, 2016)
101.http://www.history.com/news/organ-transplants-a-brief-history (last review 29 April, 2016)
102.http://www.who.int/countries/hun/en/ (last review 12 May, 2016)

Annexes

Annex 1. Worldwide Living Donors (pmp) 2015 (source: IRODaT)



Annex 2. Worldwide Actual Deceased Donors (pmp) 2015 (source: IRODaT)



Annex 3. European initiatives in organ donation and transplantation

Project	Year	Aim	Website
ACTOR (Study on the set-up of organ donation and transplantation in the EU Member States, uptake and impact of the EU Action Plan on Organ Donation and Transplantation)	2013	Analyse and overview of the organization of organ donation and transplantation systems in every European Member State as well as at EU level	http://ec.europa.eu/health/blood_tissues_organs/docs/organs_actor_study_2013_en.pdf
ACCORD (Achieving Comprehensive Coordination in ORgan Donation throughout the European Union)	2008-2013	Strengthen the full potentials of EU Member States in the field of organ donation and transplantation and improving cooperation between them	www.accord-ja.eu
Alliance-O (European Group for Coordination of Research Programmes on Organ Donation and Transplantation)	2004-2007	Set up a coordinated network of organ donation and transplantation, identifying existing programmes and proposing common strategies and joint initiatives for better coordination and efficiency of organ transplant systems	http://ec.europa.eu/research/fp7/pdf/era-net/fact_sheets/fp6/alliance-o_en.pdf
COORENOR (COORdinating a European initiative among National organizations for ORgan transplantation)	2008-20013	Establish a coordinated network between national programmes in organ transplantation, focusing on specific activities in major issues such as deceased donation, living donation and cross-border organ exchange	http://www.coorenor.eu/).

DOPKI (Improving the Knowledge and Practices in Organ Donation)	2006-2009	Improve knowledge and develop a common method to determine the potential for deceased donation and its likely outcome, and to define the limits of organ safety and quality	http://www.ont.es/publicaciones/Documents/DOPKI%20GUIA.pdf
EDD (European Donation Day)	2008-2011	Develop and disseminating guidelines for the organization of future European Donation Days	www.europeandonationday.org
EFRETOS (European Framework for the Evaluation of Organ Transplants)	2008-2013	Provide a common definition of terms and a methodology for the future establishment of a European Registry of Registries on pre- and post-transplant outcome data that could enable the monitoring of patients and the evaluation of transplant results, thereby to contribute to an improved effectiveness, quality and safety of organ transplantation	www.efretos.org
ELIPSY (Euro Living Donor Psychosocial Follow Up)	2008-2013	Contribute to the long-term psychosocial and quality-of-life follow-up of living donors. This involves the creation of tools and standardized protocols for the follow-up of living donors throughout Europe	http://www.eulivingdonor.eu/elipsy
ELPAT (2nd Conference on Organ Transplantation: Ethical, Legal and Psychosocial Aspects. Expanding the European Platform)	2008-2013	Expand the European platform on ethical, legal and psychosocial aspects of organ transplantation towards new EU member states, candidate countries and Third countries in the Black Sea and Balkan Region and foster improvement in donation policies and practices	http://www.esot.org/elpat/

ETPOD (European Training Program on Organ Donation)	2007-2009	Design and validate a professional European Training Program on Organ Donation at different levels of involvement, in order to increase knowledge on organ donation, to maximise the impact of the growing rate of organ donation and to disseminate reliable information to the EU community	www.etpod.eu
EUDONORGAN (Training and social awareness for increasing organ donation in the European Union and neighbouring countries)	2016-2018	Service contract awarded by the European Commission from the European Union budget, on the initiative of the European Parliament. Its focuses on training and social awareness for increasing organ donation at EU level.	http://eudonorgan.eu/
EULID (Euro Living Donor)	2003-2008	Reach a consensus on European common standards regarding legal, ethical, protection and registration practices in relation to living organ donors	http://www.eulivingdonor.eu/eulid/
EULOD (Living Organ Donation in Europe)	2010-2012	Increase collaboration between EU member states in order to improve the exchange of best practices on living organ donation programmes and to enhance the organisational models of organ donation and transplantation across the EU	www.eulod.eu
European Training Course in Transplant Donor Coordination ("Train the trainers")	2008-2013	Trained 79 transplant donor coordinators from all member states to provide them with the necessary knowledge to replicate this training at a national level	https://sites.google.com/a/etc.iavante.es/public-site/

FOEDUS (Facilitating Exchange of Organs Donated in EU MS)		Facilitate collaboration on organ donation between national authorities in the European Union as it is prescribed in the Directive 2010/53/EU and in the Action Plan 2009-2015 set by the European Commission.	http://www.foedus-ja.eu/
Journalists Workshops	2010-2014	To create synergies with the Council of Europe's European Organ Donation Day, these workshops were organized prior to these events	http://ec.europa.eu
Grant to the Council of Europe	Regularly renewed	To support activities in the field of blood transfusion, tissues & cells and organ transplantation	
MODE (Mutual Organ Donation and Transplantation Exchanges)	2008-2013	Promote the transfer of best practices in deceased organ donation and transplantation programs in the light of the implementation of Directive 2010/53/EC on quality and safety of human organs	www.mode-ja.org
ODEQUS (Organ Donation European Quality System)	2008-2013	Create useful evaluation tools that are meant to increase the efficiency of organ donation in all European countries. The main objective of the project was to define a methodology to assess the performance of organ procurement at hospital level, including an audit system	www.odequs.eu
TAIEX		Supports partner countries, with regard to the approximation, application and enforcement of EU legislation.	http://ec.europa.eu/enlargement/taiex/what-is-taiex/index_en.htm

Annex 4. Actions, recommendations and regulations in the donation and transplantation

Organization	Resolutions, recommendations, conventions, directives articles & further documents	Aim	Reference
WHO	Resolution WHA44.25	To endorse WHO Guiding principles on transplantation (professional codes, practices and legislation)	(World Health Assembly, 1991)
	Resolution WHA57.18	To urge WHO member states "to take measures to protect the poorest and vulnerable groups from transplant tourism and the sale of tissues and organs, including attention to the wider problem of international trafficking in human tissues and organs"	(World Health Assembly, 2004)
	Resolution WHA63.22	To endorse the updated WHO Guiding principles on human cell, tissue and organ transplantation To call on WHO member states to implement them & promote voluntary (unremunerated) donation and equitable allocation practices & to oppose trafficking. NOTIFY project - specific follow-up action to collect and publish activity	(World Health Assembly, 2010)

		data on adverse events and reactions, and to implement globally standardised coding (www.notifylibrary.org).	
	As a result of resolutions WHA57.18 and WHA63.22, a collaborative initiative between the Spanish ONT and the WHO was undertaken, termed the Global Observatory on Donation and Transplantation (www.transplant-observatory.org)		
WHO	Madrid Resolution	To call for a global goal of national responsibility in satisfying organ donation and transplantation needs, with sufficiency based on resources obtained within a country for that country and via regulated and ethical regional or international co-operation, when needed.	(Madrid Resolution, 2011)
CE	Convention for the Protection of Human Rights and Fundamental Freedoms	To protect human rights and fundamental freedoms in Europe	(Council of Europe, 1950)
	Oviedo Convention: Convention for the Protection of Human Rights and Dignity of the	To preserve human dignity, rights and freedoms, through a series of principles and prohibitions against the misuse of biological and medical advances.	(Council of Europe, 1997)

CE	Human Being with regard to the Application of Biology and Medicine: Convention on Human Rights and Biomedicine		
	Additional Protocol to the Convention on Human Rights and Biomedicine concerning Transplantation of Organs and Tissues of Human Origin	To protect the dignity and identity of everyone and guarantee, without discrimination, respect for his or her integrity and other rights and fundamental freedoms with regard to transplantation of organs and tissues of human origin.	(Council of Europe, 2002)
	Council of Europe Convention on Action against Trafficking in Human Beings	To address the trafficking of human beings for the purpose of the removal of organs	(Council of Europe, 2005)
	Study on trafficking in organs, tissues and cells and trafficking in human beings for the purpose of the removal of organs	To establish the need to distinguish clearly between trafficking in organs, tissues and cells and trafficking in human beings for the purpose of the removal of organs. To call for effective means to combat such practices and to provide comprehensive victim protection and assistance.	(Joint Council of Europe/United Nations, 2009)

CE			
	Organ Shortage: Current status and strategies for the improvement of organ donation – a European consensus document	To provide step-by-step evidence based guide to the most effective ways of procuring the maximum number of high quality organs for transplantation from deceased donors.	(Council of Europe, 2003)
	The European Directorate for the Quality of Medicines & Healthcare has also produced the Guide to the quality and safety of organs for transplantation (1st - 5th Edition) and the Guide to the quality and safety of tissues and cells for human application (1st -3rd Edition) to maximise their quality and to minimise risks and, improve the success rate of transplants.		
EU	Article 168 of the Treaty on the functioning of the European Union	To require the EU to establish high quality and safety standards for the use of blood, organs and other substances of human origin.	European Commission (2007)
	Directive 2010/53/EU of the European Parliament & Corrigendum	To provide for the appointment of Competent Authorities in all member states, for the authorisation of procurement and transplantation centres and activities, for the establishment of traceability systems, as well as for the reporting of serious adverse events and reactions.	(European Parliament and Council of the European Union, 2010)

EU		"Member states shall ensure that donations of organs from deceased and living donors are voluntary and unpaid".	
	Directive 2012/25/EU	It refers only to organs and does not cover patients travelling to another country to get transplanted, which should only be done in the strict framework of bilateral or multilateral co-operation agreements between member states and/or organ exchange organisations.	(European Commission, 2012)
	In the field of organs, but also tissues and cells and blood, the Council of Europe (EDQM) and the European Commission have a collaboration that is anchored in a grant funded via the EU Health Programme. Moreover, EU member states have a network of national competent authorities that are also part of the CD-P-TO group.		

Annex 5. Ethical issues in organ donation

Ethical issue	Description	References
Consent	Living donations should be accepted when professional care, follow-up and selection criteria for donors are scrupulously applied. In case of deceased organ donation, relatives who know or can deduce the willingness of the deceased to donate can give the consent. Consent must be given based on a free choice only after appropriate information was provided.	The Oviedo Convention (Council of Europe, 1997) and the Additional Protocol on Transplantation of Organs and Tissues of Human Origin (Council of Europe, 2002)
Conflicts of interest	Physicians involved in confirming the death of a potential donor should not be part of any of the steps of the organ donation & transplantation process.	
Financial aspects of donation and transplantation	The use of the human body and its parts must not give rise to financial gain, other comparable advantages, rewards or gifts. Allocation rules should be equitable, externally justified and transparent.	The Oviedo Convention (Council of Europe, 1997), Article 21 Additional Protocol on Transplantation of Organs and Tissues of Human Origin (Council of Europe, 2002) Article 13 of Directive 2010/53/EU

Equal access to transplantation	Organs must be allocated among patients on official waiting lists (regionally, nationally or within cross border exchange) in conformity with transparent, objective and duly justified medical criteria. Transplantation systems must me equitable and accessible for everyone. States shall take measures to improve general health and facilitate donation.	Article 3 of the Additional Protocol on Transplantation of Organs and Tissues of Human Origin (Council of Europe, 2002), Nuffield Council on Bioethics (2011)
Anonymity	The identity of both donor and the recipient should be confidential (except in the case of donation between family members), in order to protect donors, recipients and their families.	
Transparency and protection of personal rights	Donation and transplantation activities and their results must be transparent and open to scrutiny, while ensuring that anonymity is respected.	Article 16 of Directive 2010/53/EU

Annex 6. Subset of questions from ODTaSE survey

1. By clicking the link to the survey I am indicating my consent to participate. Answer

Yes, I agree to take the survey

No thanks

2. What organ donation/transplantation related training courses have you participated in? (check all that apply)

Transplant Procurement Management (TPM) trainings

European Training Program on Organ Donation (ETPOD)/ETPOD Dissemination

United Network for Organ Sharing (UNOS) trainings

National Association of Transplant Coordinators (NATCO) trainings

European Transplant Coordinators Organization (ETCO) workshops

European Society for Organ Transplantation (ESOT) courses

The Transplantation Society scholarship/training

Organización Nacional de Trasplantes (ONT) courses

None

Other (please specify)

3. Please select the course that you feel has been the most influential. (Please use the course selected below as the basis for the rest of the survey).

Transplant Procurement Management (TPM) trainings

European Training Program on Organ Donation (ETPOD)/ETPOD Dissemination

United Network for Organ Sharing (UNOS) trainings

National Association of Transplant Coordinators (NATCO) trainings

European Transplant Coordinators Organization (ETCO) workshops

European Society for Organ Transplantation (ESOT) courses

The Transplantation Society scholarship/training

Organización Nacional de Trasplantes (ONT) courses

None

Other (please specify)

4. What specific TPM course(s) did you participate in?

Face-to-Face Introductory

Face-to-Face Intermediate

Face-to-Face Advanced

Essentials in Organ Donation Seminars

Blended Professionals in Organ Donation

Blended Training for Trainers

Blended Organ Donation Quality Management

Online Donor Detection System

Online Brain Death Diagnosis

Online Donor Management

Online Family Approach

Online Organ Retrieval

Online International Tissue banking Course

TPM Masters/ International Master in Donation of Organs, Tissues and Cells for Transplantation

5. What was the title of the course you participated in?

6. What was your position at time of training?

MD

RN

Lab Technician

Biologist

Social Worker

Non-medical Ph.D.

Other (specify)

7. Please specify your specialty.

ICU

Nephrology

Emergency room

Surgery

Other (specify)

8. Please rate how you think the selected training has influenced each of the following items.

Evaluate each item listed below from: No influence (1), Very little influence (2), Some influence (3), Moderate amount of influence (4), Great deal of influence (5).

Respect from peers

Advantages in promotions

Technical skills for donation/transplantation

Knowledge of donation/transplantation

Networking ability

Attitude toward donation/transplantation

Motivation to work in donation/transplantation

Collaborative opportunities for donation/transplantation

Ability to change practices for donation/transplantation

Ability to change policies for donation/transplantation

Desire to innovate for donation/transplantation

Communication skills for donation/transplantation

7. sz. melléklet

DOKTORI ÉRTEKEZÉS BENYÚJTÁSA ÉS NYILATKOZAT A DOLGOZAT EREDETISÉGÉRŐL

Alulírott

név: Gizella Melania ISTRATE

születési név: Gizella Melania ISTRATE

anyja neve: Gizella GYÖRGY

születési hely, idő: Marosvásárhely, 1975.03.30

ROLE OF SPECIALIZED TRAINING PROGRAMS IN ORGAN DONATION: PEDAGOGICAL APPROACH
című doktori értekezésemet a mai napon benyújtom a(z)

PTE ETK Egészségtudományi Doktori Iskola

EGÉSZSÉGTUDOMÁNY HATÁRTERÜLETEI (PR-1) Programjához/témacsoportjához

Témavezető(k) neve: Dr. Rébék Nagy Gábor

Egyúttal nyilatkozom, hogy jelen eljárás során benyújtott doktori értekezésemet
- korábban más doktori iskolába (sem hazai, sem külföldi egyetemen) nem nyújtottam be,
- fokozatszerzési eljárásra jelentkezésemet két éven belül nem utasították el,
- az elmúlt két esztendőben nem volt sikertelen doktori eljárásom,
- öt éven belül doktori fokozatom visszavonására nem került sor,
- értekezésem önálló munka, más szellemi alkotását sajátomként nem mutattam be, az irodalmi hivatkozások egyértelműek és teljesek, az értekezés elkészítésénél hamis vagy hamisított adatokat nem használtam.

Dátum: 2017.02.20.

Gizella Melania Istrate