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To cite this article: Laura Hokkanen, Sandra Lettner, Fernando Barbosa, Marios Constantinou, Lauren Harper, Erich Kasten, Sara Mondini, Bengt Persson, Nataliya Varako & Erik Hessen (2018): Training models and status of clinical neuropsychologists in Europe: results of a survey on 30 countries, *The Clinical Neuropsychologist*, DOI: [10.1080/13854046.2018.1484169](https://doi.org/10.1080/13854046.2018.1484169)

To link to this article: <https://doi.org/10.1080/13854046.2018.1484169>



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Published online: 20 Jun 2018.



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Training models and status of clinical neuropsychologists in Europe: results of a survey on 30 countries

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ABSTRACT

Objective: The aims of the study were to analyze the current European situation of specialist education and training within clinical neuropsychology, and the legal and professional status of clinical neuropsychologists in different European countries. **Method:** An online survey was prepared in 2016 by a Task Force established by the European Federation of Psychological Associations, and representatives of 30 countries gave their responses. Response rate was 76%. **Results:** Only three countries were reported to regulate the title of clinical neuropsychologist as well as the education and practice of clinical neuropsychologists by law. The most common university degree required to practice clinical neuropsychology was the master's degree; a doctoral degree was required in two countries. The length of the specialist education after the master's degree varied between 12 and 60 months. In one third of the countries, no commonly agreed upon model for specialist education existed. A more systematic training model and a longer duration of training were associated with independence in the work of clinical neuropsychologists. **Conclusions:** As legal regulation is mostly absent and training models differ, those actively practicing clinical neuropsychology in Europe have a very heterogeneous educational background and skill level. There is a need for a European standardization of specialist training in clinical neuropsychology. Guiding principles for establishing the common core requirements are presented.

ARTICLE HISTORY

Received 11 January 2018
Accepted 20 May 2018

KEYWORDS

Clinical neuropsychology;
specialist education; training;
legal regulation; Europe

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Introduction

Clinical neuropsychology is a specialty within professional psychology that applies principles of assessment and intervention based upon the scientific study of human behavior as it relates to normal and abnormal functioning of the central nervous system (American Psychological Association, 2010). Within health care, clinical neuropsychologists are professionals who offer services to the benefit of patients with cognitive and behavioral symptoms related to neurological, developmental, and psychiatric disorders. The impact of all disorders afflicting the nervous system is considerable both globally and in Europe (Gustavsson et al., 2011; Olesen & Leonardi, 2003; Olesen et al., 2012; World Health Organization, 2006). According to the European Brain Council, the total European cost of disorders affecting the brain (psychiatric and neurological combined) was €798 billion in 2010, and as measured by disability-adjusted life years, they are the largest contributor to the EU's total morbidity burden, accounting for 24% of the total disease burden (Gustavsson et al., 2011; Olesen et al., 2012). Thus, there is a great need for health care, including neuropsychological consultation and services, related to these disorders.

Practice within clinical neuropsychology should be evidence-based, integrating best research evidence, clinical expertise, and individual patient needs (Chelune, 2010; Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000). The foundations for high quality clinical work are laid in training. Recently, there has been a growing interest in describing and comparing training models and professional roles within clinical neuropsychology across nations. A special issue was published in 2016 by *The Clinical Neuropsychologist* on international perspectives on education, training, and practice in clinical neuropsychology (Grote, 2016). Fourteen countries from six continents, Africa, Asia, Europe, North America, Oceania, and South America, were represented, each describing the historical perspectives of the development of the field as well as the current professional situation of clinical neuropsychologists within each country. Globally, educational requirements of clinical neuropsychologists range from bachelor's to doctoral degree (Grote & Novitski, 2016).

In the special issue, Europe was represented by two countries only, Finland (Hokkanen, Nybo, & Poutiainen, 2016) and Spain (Olabarrieta-Landa et al., 2016). The minimum degree required to practice clinical neuropsychology was a master's degree in Finland and a bachelor's degree in Spain. In both countries, board certification for neuropsychology was offered by a national authority although a licensure as a neuropsychologist was not (Grote & Novitski, 2016). The paths to specialize in clinical neuropsychology differed between the two countries. Even within one country, Spain, there were several routes and models in place (Olabarrieta-Landa et al., 2016). Variability was evident also within the Nordic countries that were compared in a recent study by Norup et al. (2017). Despite the well-established guidelines for academic and clinical education, and relatively similar socio-economic structure in these countries, the study of Norup et al. (2017) found significant differences in sociodemographic characteristics, work-setting factors, and the frequency of those having obtained approval as specialists in clinical neuropsychology (equivalent to board certification in the U.S.) among Denmark, Finland, Norway, and Sweden.

Europe mostly follows a common higher educational structure, implemented by the so-called Bologna Process. Programs are offered at three levels, bachelor's, master's, and doctoral studies, which are referred to as the three-cycle system (European Commission/EACEA/Eurydice, 2015). European standards for psychology have been proposed by the European Federation of Psychologists' Associations (EFPA) to serve as the basis for evaluating

the academic education and professional training of psychologists across countries (EuroPsy - the European Certificate in Psychology, 2017). The standards apply to the first and second cycle and define competencies for the psychologists having completed the master's level. There is less agreement on how specialist education within psychology should be arranged or how it relates to the cycles. Currently, a specialist certificate has been developed in two fields of practice, Psychotherapy and Work & Organizational Psychology (EuroPsy – the European Certificate in Psychology, 2017).

Regarding status in health care, most European countries regulate the profession of psychologist but there is large diversity in the regulation of different fields or specialist areas within psychology (European Commission, 2016). There is also wide variability in terms of the health care systems and socio-economic situations across countries. Finally, there are differences in professional roles so that psychologists in, for instance, some Nordic countries have a subordinate and primarily advisory role concerning diagnosis and treatment planning, while psychologists in other Nordic countries have a fully independent role in diagnosis and treatment of patients (Hessen, Hokkanen, Nyman, Bartfai, & Gade, 2016). No reports exist describing training models, or legal and professional regulations in clinical neuropsychology within Europe.

In 2015, EFPA established a Task Force on Clinical Neuropsychology (TFCN) to evaluate the situation of the field of clinical neuropsychology within Europe. This paper describes the results obtained. The aim of the study was to examine the legal regulation, the specialization training models, and the professional status including independence in the work of clinical neuropsychologists in different European countries. Another aim was to study if a more systematic training, or a longer duration of training, is associated with higher independence of clinical neuropsychologists.

Methods

An online survey was prepared by the TFCN to obtain information on: (A) the legal status; (B) the training models; (C) the role in health care of clinical neuropsychologists; and (D) access to neuropsychological diagnostics and treatment across Europe. This paper focuses on the topics A, B, and C. The full survey can be found in Appendix 1.

Survey preparation

The topics (A-D) were assigned to the ten active members of the TFCN (the authors of this paper), each an expert in the field of clinical neuropsychology and representing a different country in Europe. A pool of questions was generated for each topic. All questions were then reviewed by the TFCN. Questions that were considered less relevant, or not applicable in different language and cultural contexts, were eliminated. After item reduction and revision, a set of questions (9 for topic A, 11 for B, 12 for C, and 3 for D) were selected for the final survey. As a pre-test, the selected questions were circulated among the five corresponding members of the TFCN, representing Croatia, Czech Republic, Iceland, Latvia, and Lithuania, for comments.

After the survey was converted into electronic format, a pilot was conducted to confirm the usability and technical functionality of the measure. Between June and August 2016, five respondents from different countries (Austria, Finland, Poland, Netherlands, and

Germany), including respondents outside the TFNC, completed the electronic survey and gave comments on the usability. The final revision was then made.

The final survey included 36 questions in a fixed order and took 30–45 min to complete. Adaptive questioning, where the next item to be administered depends on the response to the previous item, was used on two occasions. All questions were in the English language. Question format was structured, but each closed question was followed by an open one providing space for free text. Questions were presented on a series of linked pages, instead of a single scrolling page, with each topic (A–D) on its own screen. The survey began with questions on the following background information: respondent country, organization (name and link), name, contact information, and position within the organization. Respondents were able to review and change their answers using the Back button in their browser. They were also able to save their responses and return later using a password provided.

Key concepts were defined for clarity. A clinical neuropsychologist was defined as an individual who spends about 50% or more of their time in one or more of the following activities: neuropsychological clinical practice, patient work in neuropsychological assessment, or rehabilitation. The activities were not to be limited to research or teaching only. Levels of university education were defined referring to the Bologna three-cycle model: bachelor's, master's, and doctoral degree (European Commission/EACEA/Eurydice, 2015). If the national degrees differed from this model, clarification was asked. In describing the models for specializing as a clinical neuropsychologist, a "program" was defined as a systematic series of coursework that forms a pre-planned curriculum qualifying in clinical neuropsychology and awarding a diploma or certificate, while "individual courses" were defined as single continuing education courses, not forming a pre-planned curriculum.

Administration procedure

The survey was launched in September 2016 using Survette platform (Fountain Park Ltd, Helsinki, Finland), a web-based data gathering tool. The survey was password protected, closed to the invited participants only. The invitations were distributed by email and they included a link to the electronic survey, a unique username and password for each organization, a cover letter, and a pdf version of the survey. The front page of the survey included information on the rationale and topics of the survey, and the estimated time taken to complete it (see Appendix 1). The cover letter was signed by the chair of the TFCN and the president of the FESN (Appendix 2). No incentives were offered. Repeated reminder emails were sent to the organizations that had not provided answers, and participation was also encouraged at a FESN council meeting.

The electronic survey system captured the responses automatically into an Excel file. In addition to online responses, emailed pdf responses were accepted. Responses given in the pdf format were entered manually into the electronic system by the first author.

Participants

The target population consisted of representatives of the European psychological organizations. Invitation to participate was sent to all 36 EFPA member organizations (national psychological associations) and all 16 Federation of the European Societies of

Neuropsychology (FESN) member organizations (national neuropsychological societies), using contact information obtained from EFPA and FESN, respectively. All 16 countries with a FESN member organization also had an EFPA member organization but the FESN member organizations were included because they were expected to have valuable information on the local status of neuropsychologists and their training. Representatives of relevant non-member organizations in five additional European countries were invited using information found on the internet or personal contacts. The total number of countries invited to participate was 41.

By March 15, 2017, respondents from 31 countries (76%) had completed the survey. Respondents from Andorra, Belarus, Bosnia & Herzegovina, Bulgaria, Malta, Moldova, Romania, Slovakia, Slovenia, and Ukraine did not complete the survey. The response from Hungary included a general description of their situation but no replies to the survey questions, and it was excluded from the analyses. The data from the remaining 30 countries are analyzed although not all respondents answered all questions. The country with most missing values was The Republic of San Marino. It is a member of EFPA but due to its small size does not have an established profession of clinical neuropsychologists independent of Italy.

From six of the 30 countries, two separate sets of responses were obtained, from both the EFPA and the FESN member organization. In the analyses, a reconciled version of the responses was used. For one country (Luxemburg), all responses were matching, and no further clarification was needed. For three countries (Austria, France, and Portugal), a TFCN member coming from that country reconciled the responses. For two countries (Estonia and Switzerland), a TFNC member contacted the original respondents for clarification and reconciliation.

Of the 30 respondents, 16 (53%) were presidents of the organization; others were secretaries or board members within the organization. All had a background in psychology or neuropsychology.

Measure reliability and statistical methods

Reliability of the measure was examined by analyzing the six countries with two responders (from both the EFPA and the FESN member organization). The similarity of the responses in these pairs was compared. As there were six responder pairs, and 28 question items in total were analyzed, the responses were either matching or not in 168 cases. Of the 168 response pairs, 119 (71%) were matching.

The results were analyzed qualitatively, cross-tabulating the responses in Excel, as well as quantitatively using SPSS version 24 (IBM Corp., NY, USA). Continuous variables are described using means (*M*) and standard deviations (*SD*). The total length of education was calculated by combining the years for the required basic academic degree and the years for specialist education. The length of the specialist education at post-master's level is depicted separately. Contingency between different training models and dichotomous frequencies of sub-ordinance of clinical neuropsychologists, independence in diagnosing, independence in rehabilitation services, or the ability to obtain leadership positions within health care were analyzed using Chi-square statistics. The total length of education was compared between those with reported independence and those without independence in each of the dichotomous variables and analyzed using a t-test for unequal variances.

Results

Table 1 gives the estimated numbers of active clinical neuropsychologists in each of the 30 countries and in the countries combined, along with population size and practitioner to population ratio. The respondents were asked to specify if the numbers were based on either official statistics or on their personal estimates. They were also asked to mention the source if it was official statistics. The number of neuropsychologists was based on official statistics specified in the survey in six (20%) countries and on other available records or personal estimates of the respondent in others. Population data were obtained from Eurostat (2017).

Legal status

As shown in Table 2, the title “Psychologist” was protected by law in 25 (86%) of the responding countries, while the title of “Clinical neuropsychologist” was protected in five (17%) countries. Only Austria, Liechtenstein and the Netherlands reported to regulate the title of “clinical neuropsychologist” as well as the education and practice of clinical neuropsychologists by law. The Ministry of Health, either alone or together with other ministries, was the regulatory

Table 1. Countries ($n = 30$) responding to the survey and reported number of practitioners in each country. Population data are taken from Eurostat (Jan 1st 2017). The number of clinical neuropsychologists was based on official statistics in six countries and on other available records or personal estimates of the respondent in others. Note that the definition of a neuropsychologist varies between countries.

Participating countries	Population, million	Estimated number of active clinical neuropsychologists	Ratio of practitioners per population
Austria	8.77	650	1 / 13,492
Belgium	11.37	200	1 / 56,850
Croatia	4.15	15	1 / 276,667
Cyprus	.85	5	1 / 170,000
Czech Republic	10.58	20	1 / 529,000
Denmark	5.75	550	1 / 10,455
Estonia	1.32	23 ^a	1 / 57,391
Finland	5.50	250 ^a	1 / 22,000
France	67.02	5000 ^a	1 / 13,404
Germany	82.80	700	1 / 118,286
Greece	10.76	60	1 / 179,333
Iceland	.34	13	1 / 26,154
Ireland	4.77	40	1 / 119,250
Italy	60.59	2000	1 / 30,295
Latvia	1.95	0	NA
Liechtenstein	.04	1	1 / 40,000
Lithuania	2.85	10	1 / 285,000
Luxembourg	.59	50	1 / 11,800
Netherlands	17.08	150 ^a	1 / 113,867
Norway	5.26	330 ^a	1 / 15,939
Poland	37.97	100	1 / 379,700
Portugal	10.31	150	1 / 68,733
Russia	146.79	600	1 / 244,650
San Marino	.03	0	NA
Serbia	7.04	10	1 / 704,000
Spain	46.53	1000	1 / 46,530
Sweden	10.00	500	1 / 20,000
Switzerland	8.42	300	1 / 28,067
Turkey	79.81	40	1 / 1,995,250
United Kingdom	65.81	600 ^a	1 / 109,683
TOTAL	715.05	13,367	1 / 53,494

^aOfficial statistics specified in the survey.

Table 2. Legal regulation and licensing of psychology, clinical psychology, and clinical neuropsychology in the European countries.

Regulatory status	Frequency	%
The title Psychologist is protected by law	25	86
Education of Psychologists is regulated by law	17	57
Education of Clinical Psychologists is regulated by law	15	52
Practice of Clinical Psychologists is regulated by law	16	55
Both education and practice of Clinical Psychologists are regulated by law	11	38
Title of Clinical Neuropsychologists is protected by law	5	17
Education of Clinical Neuropsychologists is regulated by law	5	17
Practice of Clinical Neuropsychologists is regulated by law	4	14
Both education and practice of Clinical Neuropsychologists are regulated by law	3	10
License by competent authorities needed to practice Clinical Neuropsychology	10	34

Notes: total $n = 29$, data from San Marino missing.

Table 3. The minimum university degree route required to practice clinical psychology and clinical neuropsychology as defined by official national authorities ($n = 30$). Frequencies in each educational level and the total length of education (years for the basic academic degree and the specialist education combined) in years.

	Clinical psychology	Clinical neuropsychology
Level of Education Bachelor	3 (10%)	2 (7%)
Master	16 (54%)	14 (48%)
Doctorate	2 (7%)	2 (7%)
Other	9 (28%)	9 (28%)
Requirements not defined	0	3 (10%) ^a
Total length of education ^b , years, $M \pm SD$ Minimum - maximum	5.7 ± 1.5 3–10	6.7 ± 2.1 3.5–11.5

Notes: ^aFollow-up question: what is the most typical degree; Answers: master's, 5–6 years.

^bIncluding the years required on top of the academic degree, as implicated in "other."

body of psychologists' activity in 18 (64%) countries, the Ministry of Social Affairs in six (21%) countries, and the Ministry of Education in six countries. In 10 (34%) of the responding countries, a license by a national authority, such as a psychological association or specialist board, was required for practicing clinical neuropsychology (see Table 2). Either legal regulation or licensing by national authorities within clinical neuropsychology was required in 13 (45%) of the countries.

Training models

The most common university degree required to practice clinical psychology, as well as clinical neuropsychology, was a master's degree appearing in 54% and 48% of the responses, respectively (Table 3). Those answering "Other" described national requirements of training in clinical or health psychology, and clinical neuropsychology, following either the bachelor's or master's degree. In four countries (France, Greece, Latvia, and Serbia), specialization in clinical neuropsychology was reported to take place between bachelor's and master's degree; in others, it was at the post-master's level. The mean total length of education for clinical neuropsychologists was 6.7 years ($SD = 2.1$). In 11 (37%) countries, specialization was achieved by completing a pre-planned program, in six (20%) by participating in individual courses according to certain requirements, and in three (10%), there was another commonly agreed model involving flexible routes. In 10 (33%), countries there was no commonly agreed

Table 4. Bodies providing either the training programs or the continuing education courses in clinical neuropsychology in the countries ($n = 20$) with a training model in place.

Body	Training programs	Individual courses
University	11 (55%)	11 (55%)
National ministry / health department / authority	4 (20%)	2 (10%)
National psychological association	5 (25%)	8 (40%)
National neuropsychological society	6 (30%)	9 (45%)
Another public organization	0	3 (15%)
Private / commercial training institute	4 (20%)	5 (25%)

model. This included the five responding countries with a population less than 1 million. Table 4 shows the bodies providing either the programs or courses in clinical neuropsychology in the countries where a model existed. Universities were the most common provider in both types of education.

Figure 1 shows the length of the specialist education at the post-master's level. It varied between 12 and 60 months ($M = 32.9$, $SD = 13.9$ months). Countries with a program of 36 months or above after master's degree were Germany, Finland, Italy, Netherlands, Norway, Poland, and Spain. Countries where individual courses are required for specialization, instead of a pre-planned program, did not define a specific length of the education as the courses can be attended at any schedule. Practical training to obtain the specialization in clinical neuropsychology (expressed either as months of internship or obligatory work experience, or as hours of supervised practice) was required in 21 (81%) of the 26 countries that responded to this question. The length varied between 3 and 60 months ($M = 23.9$ months, $SD = 20.7$, with one month calculated as 160 h, one outlier excluded), see Figure 1. Countries with 4 or more years of required practical training were Czech Republic, Denmark, Finland, Norway, and Portugal.

Five (17%) countries reported having official sub-specializations. The indicated sub-specializations were child/pediatric and adult neuropsychology in four countries. One country, Spain, reported having adult, child/pediatric, geriatric, forensic, and educational neuropsychology as subfields of specialization.

Role in health care and independence of work

Respondents from 26 (87%) countries stated that clinical neuropsychology was situated within psychology or clinical psychology; respondents from four countries situated the field within another profession, such as medicine, neurology, or psychophysiology. Figure 2 illustrates clinical neuropsychological services by professionals providing them. Twenty-eight countries specified the professionals conducting full Neuropsychological Assessments (NPA), one country (Latvia) stated they have no neuropsychological practice for this type of service. In 22 countries (78%), all NPAs were performed either by neuropsychologists with a psychologist's background or other psychologists, and in 12 (43%) countries neuropsychologists were the only profession conducting the NPAs. In six (21%) countries, other professionals also perform full NPAs. Twenty-nine countries specified the professionals conducting cognitive screening (such as Mini Mental Status Examination or short sport concussion testing), and in all, screening was performed by a wide range of health professionals, such as neurologists, psychiatrists, logopedics / speech pathologists, and occupational therapists (see Figure 2).

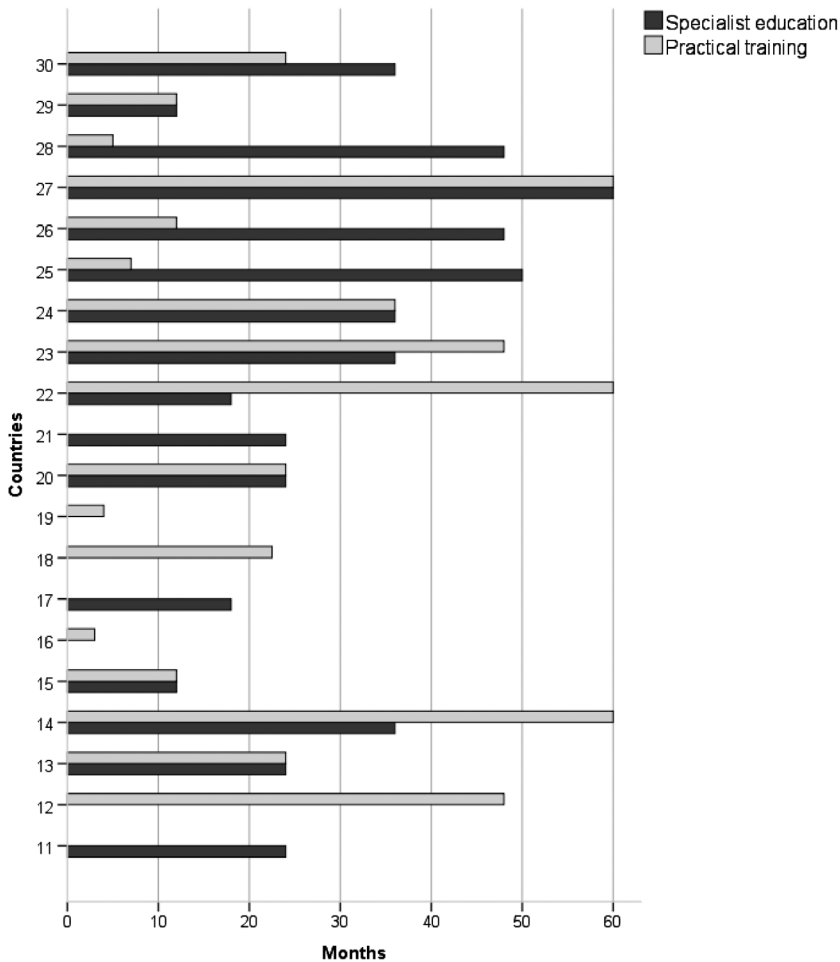


Figure 1. The length of the specialist education after the basic required degree, and the length of the practical training / internship period required for specializing in clinical neuropsychology in countries with a model in place, depicted in months. The model in countries 11–13 involves flexible routes, in countries 14–19 individual courses, and in countries 20–30 a pre-planned program. Practical training not required for countries 11, 13, 17, and 21. Length of the specialist education undefined for several countries without a program. Countries 1–10 with no post-master's training model excluded from the figure.

Table 5 shows the reported independence of clinical neuropsychologists. In 10 (36%) countries, clinical neuropsychologists were reported to be subordinate to other professions, mostly neurologists, psychiatrists, pediatricians, and geriatricians. Independence in other aspects of work ranged between 61 to 86% (Table 5). Five countries indicated that, although neuropsychologists were reported to be independent in their rehabilitation work, the patient is reimbursed only if this work is conducted in collaboration with or prescribed by a medical doctor.

As shown in Table 5, independence in treatment or rehabilitation was associated with the training model (after correcting for zero observations in one cell and comparing any model to no model, $\chi^2 = 4.19, p = .041$). The total length of education was longer ($M = 6.9$ years, $SD = 2.0$, $n = 25$) in countries where clinical neuropsychologists independently worked in treatment or

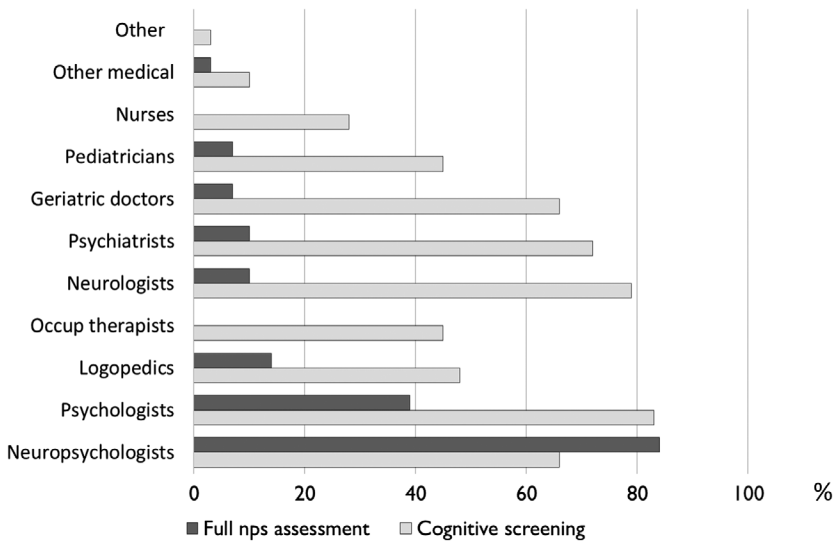


Figure 2. Distribution of professionals conducting neuropsychological services, either full neuropsychological (nps) assessments or cognitive screening, in Europe. The X-axis gives the percentage of countries mentioning each provider out of all respondents ($n = 29$). Neuropsychologists in this question were defined as professionals with a psychologist's background.

Table 5. Cross tabulated association between training models and independence of work of clinical neuropsychologists in Europe.

Training model / Independence in work	Pre-planned program ^a ($n = 14$)	Individual courses ($n = 6$)	No model ($n = 9$)	Total	Chi square (p)
Are CNPs subordinate to other professions in their clinical work?					1.146 $p = .564$
No	10 (71%)	3 (50%)	6 (75%)	19 (68%)	
Can CNPs independently diagnose, using DSM-5 or ICD-10?	9 (64%)	4 (67%)	4 (50%)	17 (61%)	.549 $p = .760$
yes	14 (100%)	5 (83%)	6 (67%)	25 (86%)	5.172 $p = .075$
Can CNPs independently do treatment or rehabilitation?					$p = .041^b$
yes	12 (86%)	3 (50%)	6 (67%)	21 (72%)	2.898 $p = .235$

Notes: CNP = clinical neuropsychologist; total $n = 29$, data from San Marino missing.

^aThree countries with flexible routes included in this category.

^bComparing any model to no model.

rehabilitation, compared to countries where they were not independent ($M = 4.9$ years, $SD = 1.0$, $n = 4$), $t(7) = 3.05$, $p = .019$. No other significant differences in the length of education were found between those who were independent and those who were not independent.

Discussion

The aims of the study were to analyze the current European situation of specialist education and training within clinical neuropsychology, and the legal and professional status of clinical

neuropsychologists in different European countries. The results confirmed the heterogeneity of legal regulation and training models within Europe. In one third of the countries, no commonly agreed model for specialist education existed. Our findings suggest that a more systematic training model and a longer duration of training were associated with more independence in the work of clinical neuropsychologists.

To better characterize the professional situation in different countries, the survey included a question regarding the number of clinical neuropsychologists. As expected, variation was noticeable both in absolute numbers and in practitioner to population ratios. This suggests a very different prominence of clinical neuropsychologists within health care in these countries. The estimated number of clinical neuropsychologists among all 30 participating European countries combined was 13,367. This, compared to the total population, results in a ratio of 1 practitioner per 53,494 inhabitants. These numbers should be viewed with caution as most of them are not based on official national statistics. The numbers are also subject to very different definitions on what constitutes a clinical neuropsychologist. Globally, examples on the ratio of practitioners to the national population include 1 per 40,885 in Australia, 1 per 19,444 in Canada, 1 per 86,667 in Japan, and 1 per 80,250 in the US (Grote & Novitski, 2016). European density of clinical neuropsychologists appears higher compared to the US, but it must be emphasized that training to become a clinical neuropsychologist in the US is more comprehensive than the average European training, including both a doctoral degree and post-doctoral training (Hannay, 1998; Sperling et al., 2017).

Legal status

Clinical neuropsychologist was found to be a protected title in only five of the countries surveyed. The profession of psychologists is well regulated in Europe (European Commission, 2016), and also according to the results of this survey, the general title is protected in the majority of the countries. Specialist fields within psychology are less regulated, however. According to the present results, the education and practice of clinical psychologists was regulated more often than those of clinical neuropsychologists. In addition to legal regulation, health professions are often regulated by national authorities providing a license for practicing, or by specialist boards providing certification. National associations and societies often keep registries of qualified professionals but their regulatory effect is less well defined. Based on the survey, neither legal regulation nor licensing by national authorities within clinical neuropsychology was required in 55% of the countries which raises concerns. In the absence of clear national directives, any psychologist or other health professional may have the opportunity to practice clinical neuropsychology without proper specialization training.

Title protection is recommended for several reasons. The advantage of legal regulation for patients and clients lies in the quality assurance of care and patient protection (European Commission, 2016). General regulatory statutes and code of ethics within health care, including those for psychologists (see <http://ethics.efpa.eu/guidelines>), aim to ensure that the professionals practice within their limits of competence and expertise. Infringement of these statutes can be processed subsequently. Protection of the title of clinical neuropsychologist would serve in infringement prevention. Clearly defined registries help patients to find qualified health care providers and distinguish them from individuals who are not appropriately trained. Statutory regulations for the professional practice also mean that professionals have

to abide by rules in duties like the duty of information, documentation and confidentiality, or continuing professional development. Overall, it can be argued that regulations serve to further professionalize clinical neuropsychology and lead to a recognition of the occupational group in health care and society.

Training models

A master's degree was found to be the most common academic degree required from psychologists. This is in line with the EuroPsy certificate system, where academic education in psychology of five years or more, followed by a one-year practical training, is required (EuroPsy – the European Certificate in Psychology, 2017). Diversity exists, however, in the entry-level requirements for practice within health care. Further training in clinical psychology or health psychology was reported to be necessary in several countries. In the UK and Ireland, a doctoral degree (usually based on a bachelor's degree followed by a three-year course resulting in a doctorate in clinical psychology) is the prerequisite. In Norway, the basic psychology education also takes six years, leading to the title Psychologist, authorized to practice within health care and to enter specialist education.

Specialist education in clinical neuropsychology was mostly understood as training after the completion of a master's degree. This is in accordance with the EuroPsy specialist model. Some countries relied on specialized master programs, but these were a small minority. In specialist education, a distinction was made between systematic training programs and other models consisting of individual courses. The majority of countries with a commonly agreed upon model reported having a program, allowing for a more systematic planning of courses with cumulative learning objectives and competencies. Regardless of the model, attention should be paid on a sufficient breadth and depth of the courses completed. Courses, taken either as part of a program or individually, should also be accredited by a national association or authority to ensure a sufficient quality (EuroPsy – the European Certificate in Psychology, 2017).

In the present survey, universities were the most common provider of both systematic training programs and individual courses. A model where universities provide the theoretical courses and collaborate with health care providers offering the practical training opportunities may strengthen the research-based foundations of practice and bridge the gap between academia and the clinical world. Research experience has been considered an integral part of specialist education in many programs, both in Europe and US (Hannay, 1998; Hesse et al., 2018). Traditionally, national psychological associations and neuropsychological societies have been active providers of continuing education, which was also evident in this survey. They can also have a strong mandate from the Ministry of Health, as in Austria and Norway where the psychological association and/or society organizes the specialization, which is required by the health authorities for professional practice in clinical neuropsychology.

The length of the specialist education varied between the countries, ranging from one to five years. Combined with the variability in the academic degree preceding the specialist education (from a bachelor's to a doctoral degree), the total length of the educational pathways in becoming a certified specialist in clinical neuropsychology can vary from three to twelve years. This variability undermines the unity of the professional status within Europe. In defining the optimal length of specialist education, the context and prior studies need to

be considered. If specialization in clinical or health psychology is required before specialization in neuropsychology, advanced competencies relating to clinical psychology have already been acquired before entering the training. If not, they need to be incorporated into the specialist education for clinical neuropsychologists, which adds to the duration. The EuroPsy specialist certificate for both Psychotherapy and Work & Organizational Psychology includes 90 ECTS / 2400 h of further study following the master's degree, corresponding to 1.5 years of full time work (EuroPsy – the European Certificate in Psychology, 2017). This can be considered the minimum. The present survey did not ask about the content of teaching or competencies acquired during studies, but in a recent comparative study on competencies across the globe, a picture of similar competency structures emerged in a representable sample of countries where clinical neuropsychology is well established as a specialty within health care (Hessen et al., 2018). The study suggests a transferrable list of learning objectives and advanced competencies expected at the time of entry into the profession. Achieving those competencies typically requires several years of post-graduate training in clinical neuropsychology.

A practical training / internship period was required in 81% of the countries with a mean length of close to two years. This is in line with the concept of clinical expertise being achieved only by integrating scientific study to practical skills training (Nelson et al., 2015). The way the experiential learning was arranged, and the balance between theoretical coursework and supervised practice differed between countries. Some countries seem to rely almost entirely on learning through practice, only adding a short period of theoretical study to the required practical training. In other countries, the practical training is taking place alongside the studies for several years (part time study, part time work). This allows the theoretical knowledge to be transformed into an applied competence in a natural setting. Some countries also indicated that practical experience was a pre-requirement for entering the specialization program, emphasizing the importance of general competencies in psychological service and health care systems for learning. The EuroPsy specialist certificate for both Psychotherapy and Work & Organizational Psychology includes at least three years of postgraduate practice with at least 150 h of supervision (EuroPsy – the European Certificate in Psychology, 2017). Practicum periods all through the doctoral training, an internship, and a two-year post-doctoral training in clinical neuropsychology are essential elements also in the US model (Nelson et al., 2015; Sperling et al., 2017).

In one third of the countries, no commonly agreed upon model for specialist education existed, which is one of the most striking findings of the survey. Some countries reported currently being in the process of generating models, and documents such as the current one aim to assist in this process. In some of these countries, neuropsychological assessment and other services were lacking altogether, while in other, the services were offered by a heterogeneous group of professionals, such as developmental psychologists, clinical psychologists, geriatric psychologists, neurologists, and psychiatrists. The aim should be a common training model that ensures equal and high standards in the services of clinical neuropsychology across Europe.

Role in health care and independence of work

In most countries in Europe, clinical neuropsychology is a profession stemming from psychology and countries where clinical neuropsychology is situated in a medical field were

found to be exceptions. Accordingly, while cognitive screening was performed by a large variety of professionals, full neuropsychological assessments were carried out mostly by neuropsychologists with a psychologist's background.

It was hypothesized that a more systematic model of education or a longer training period would be associated with more independence of work. This association was statistically confirmed only between the length of training and being able to independently carry out rehabilitation. Being subordinate to other professions in clinical work, being able to independently diagnose using medical diagnostic systems, or obtaining leadership positions in public health care were not associated with training in this sample. Despite 30 countries responding, cross-tabulated group sizes in analyses were small, hampering the power of the analyses. Also, as the roles and responsibilities of each health profession have developed gradually in a historical context (Hessen et al., 2018), changes in the educational model may take a long time to change these hierarchies.

Another desired effect of systematic specialist education, in addition to the gained independence of work, is better quality of work. In the current study, details of practices were not surveyed and cannot be compared among those with different length of training. In a recent study from the Nordic countries (Egeland et al., 2016), participants that had obtained a formal specialist status in clinical neuropsychology both knew and used more tests on a regular basis than non-specialists. This suggests broader knowledge-based and skill-based competencies developed through training.

Strengths and limitations

This survey is the first of its kind to gather evidence on the status of clinical neuropsychology within the whole of Europe. Strengths of the study include a representative sample of European nations. All geographical regions of Europe were covered, Northern, Eastern, Southern, and Western. The rate of participated countries, 76%, can be considered excellent as the questions were clearly not all easy to answer. All countries with a well-established profession of clinical neuropsychology in Europe responded.

The countries that did not respond were mostly from Eastern parts of Europe. In further surveys, it would be important to get information also from these countries, as they too belong to the EU and share the common job market. There were also small countries, Andorra and Malta, that did not respond. Like similar sized Liechtenstein, Luxembourg, and San Marino that gave responses, they probably have close connections to their neighboring countries and rely on them for specialist education. This exemplifies Europe as not only a common job market but also a common educational arena.

There were also limitations to the study. Most respondents were high-rank representatives (presidents and secretaries) of national organizations and, as such, well acquainted with the status of psychologists, clinical psychologists, and clinical neuropsychologists in their country. Still, the accurateness of the information given should be viewed with caution. In cases with two sets of responses, the compatibility of the answers was 71%. The survey was conducted in English, and there may have been issues relating to translations of terms and concepts. In open questions, the respondents described the situation in their country in more detail, using their own words, which improved the reliability. The responses also showed that the alternatives provided were sometimes open to interpretation for reasons other than language. For instance, with regards to the independence in clinical work, legal

regulations in some cases indicated independence of clinical neuropsychologists, while reimbursement policies indicated dependence on medical doctors. A yes-or-no-answer inadequately captured this complexity. As the circumstances in countries across Europe are different, all questions were not relevant or applicable to all countries. Despite these caveats, the responses give a reliable general overview of the legal status and training models in Europe.

Conclusions

The role of clinical neuropsychologists in European health care varies, from fully protected to not regulated, from having exclusivity on providing neuropsychological services to having many competitors, from independent work to subordinate. The pathways for the training of clinical neuropsychologists are also diverse. Uniform standards within Europe have been sought for different medical professions. For medical doctors, the European Council has developed directives 93/16/EEC and 2005/36/EC to describe the minimum standards of basic medical training and to promote the mutual recognition of qualifications across Europe. For psychologists, efforts such as the EuroPsy have aimed to set standards for the basic level of training, but specialist areas show high variability. The European Brain Council has called upon political action, and quantitatively and qualitatively improved teaching at medical schools and other health-related educations, including psychological treatments (Gustavsson et al., 2011). This survey highlights the need for such action.

One of the consequences of the existing variability is that the population in Europe is receiving clinical neuropsychological health services at different quality levels depending on their home country, despite the largely comparable prevalence of diseases and disabilities. As legal regulation is mostly absent and training models differ, those actively practicing clinical neuropsychology have a very heterogeneous educational background and skill level. Different levels of training and diverse formal competencies in clinical neuropsychology represent a challenge also for the establishment of a common job market in the EU, hindering the mobility of clinical neuropsychologists between different European countries. There is clearly a need for standardization of core requirements in specialist training in clinical neuropsychology in Europe.

Based on the information collected, establishing the common requirements can build upon the following guiding principles. The specialist education in clinical neuropsychology should be preceded by at least a five-year master's degree (or equivalent) in psychology and a minimum of one-year clinical practice. The core elements of the specialist education should include theoretical study, practical training with supervision, and research experience. The theoretical studies, whether in the form of a program or a combination of courses, should be accredited by a national authority. The length, depth, and breadth of the different elements within the specialist education must be sufficient to allow for the accumulation of advanced competencies necessary for a successful entry in the profession. Achieving these competencies typically requires several years of specialization in clinical neuropsychology.

Notes

1. If you marked "e" please go to question 11, otherwise to question 12.
2. If you marked "e" please go to question 13, otherwise to question 14.

3. Program refers to a systematic series of coursework that forms a pre-planned curriculum qualifying in Clinical Neuropsychology and awarding a diploma / certificate.
4. Individual continuing education courses refer to single courses, not forming a pre-planned curriculum.
5. Public entities such as a national health care system, social security, occupational accident insurance (paid by the employer) or national pension insurance (paid by the employer)
6. Private entities such as private health insurance companies, occupational accident insurance (paid by the patient), private accident insurance (paid by the patient) or private pension insurance (paid by the patient)
7. Public entities such as a national health care system, social security, occupational accident insurance (paid by the employer) or national pension insurance (paid by the employer)
8. Private entities such as private health insurance companies, occupational accident insurance (paid by the patient), private accident insurance (paid by the patient) or private pension insurance (paid by the patient)

Acknowledgment

The authors also thank all psychological associations and neuropsychological societies that replied to the survey, making this study possible.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

The work of the Task Force on Clinical Neuropsychology has been supported by Berufsverband Deutscher Psychologen, The Experimental section of the Italian Psychological Association, the Finnish Psychological Association, the Cyprus Psychologists' Association, the Norwegian Psychological Association, Ordem dos Psicólogos Portugueses, the Professional Association of Austrian Psychologists, the Russian Psychological Society, and the Swedish Psychological Association.

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Appendix 1. Online survey to record the current situation of Clinical Neuropsychology in Europe

This proposal is presented by the EFPA Task Force on Clinical Neuropsychology
<http://www.efpa.eu/working-groups>

EFPA is the leading Federation of National Psychologist's Associations. It provides a forum for European cooperation in a wide range of fields of academic training, psychology practice and research. There are 36 member associations of EFPA representing about 300,000 psychologists. The member organizations of EFPA are concerned with promoting and improving psychology as a profession and as a discipline, particularly, though not exclusively, in applied settings and with emphasis on the training and research associated with such practice. The psychologists in the member associations include practitioners as well as academic and research psychologists. The Federation has, as one of its goals, the integration of practice with research and the promotion of an integrated discipline of psychology.

At the general assembly 2015, the Task Force on Clinical Neuropsychology was mandated to develop an online survey. The aim of the survey is to analyze the current situation of the field of Clinical Neuropsychology in Europe, to collect information on the specialization training within the field, both within universities and in clinical practice and to also collect information on its' legal and professional status. The best national examples are to be presented at the next general assembly in 2017. Furthermore, the task force was asked to make recommendations as to how specialization training in neuropsychology should be developed in the future.

The survey consists of 36 items and will take you approximately 30 minutes. Please read all items carefully. You can save your answers at the end of each section and return to finish it at a later stage. The survey consists of 4 sections:

- (a) The legal status and the licensure of Psychologists and Clinical Neuropsychologists
- (b) Training models for Clinical Neuropsychology
- (c) The role of Clinical Neuropsychologists in health care
- (d) Service providers and access to diagnostics and treatment

In this survey, a Clinical Neuropsychologist is defined as: an individual who spends about 50% or more of their time in one or more of the following activities: neuropsychological clinical practice, patient work in neuropsychological assessment, and rehabilitation. The activities are not limited to research or teaching only.

Please insert:

Country:

Organisation (name and LINK):

Respondent (name and contact):

Position of the respondent in the organisation:

Section A: The legal status and licensure of Psychologists and Clinical Neuropsychologists

(1) Is "Psychologist" a title protected by law in your country?

- (a) No
- (a) Yes

If yes, which (give the name of the law(s)):

(2) Who is the regulatory body of the law in your country?

- (a) Ministry of Health
- (b) Another ministry

Who:

- (c) Several

Who:

(3) Is there any law which regulates the education of Psychologists in your country?

- (a) No
(b) Yes

If yes, give the name of the law:

(4) Is there any law which regulates the education of Clinical Psychologists in your country?

- (c) No
(b) Yes

If yes, give the name of the law:

(5) Is there any law which regulates the practice of Clinical Psychology in your country?

- (a) No
(b) Yes

If yes, give the name of the law:

(6) Is 'Clinical Neuropsychologist' a title protected by law in your country?

- (a) No
(b) Yes

If yes, give the name of the law:

(7) Is there any law which regulates the education of Clinical Neuropsychologists in your country?

- (a) No
(b) Yes

If yes, give the name of the law:

(8) Is there any law which regulates the practice of Clinical Neuropsychology in your country?

- (a) No
(b) Yes

If yes, give the name of the law:

(9) Is there any law which regulates professionals other than those trained in Psychology who are able to practice Clinical Neuropsychology in your country?

- (a) No
(b) Yes

If yes, give the name of professions:

Section B: Training models for Clinical Neuropsychology

Levels of university education refer to the Bologna three cycle model: bachelor, master, doctorate (see https://en.wikipedia.org/wiki/Bologna_Process). If your degrees differ from this model, please explain in your answer.

- (10) What is the minimum university degree route required to practice Clinical Psychology as defined by official authorities in your country (e.g. ministry)? Include the length of education in years.
- (a) Bachelor (years)
 - (b) Master (years)
 - (c) Doctorate (years)
 - (d) Other (years), please explain:
 - (e) Requirements for psychology not defined¹
- (11) What is the most typical university degree route required to practice Clinical Psychology in your country? Include the length of education in years.
- (a) Bachelor (years)
 - (b) Master (years)
 - (c) Doctorate (years)
 - (d) Other (years), please explain:
- (12) What is the minimum university degree route required to practice Clinical Neuropsychology as defined by official authorities in your country (e.g. ministry)? Include the length of education in years.
- (a) Bachelor (years)
 - (b) Master (years)
 - (c) Doctorate (years)
 - (d) Other (years), please explain:
 - (e) Requirements for psychology not defined²
- (13) What is the most typical university degree route required to practice Clinical Neuropsychology in your country? Include the length of education in years.
- (a) Bachelor (years)
 - (b) Master (years)
 - (c) Doctorate (years)
 - (d) Other (years), please explain:
- (14) How does one specialize as a Clinical Neuropsychologist in your country?
- (a) By completing a pre-planned training program³
 - (b) By participating in individual courses according to certain requirements⁴
 - (c) Other commonly agreed model, please explain:
 - (d) There is no commonly agreed model
- (15) Which body/bodies provide the training program (referred to in question 14a) in Clinical Neuropsychology in your country? Include the minimum length.
- (a) Universities _____months
 - (b) National ministry / health department / authority _____months
 - (c) National psychological association _____months
 - (d) National neuropsychological society _____months
 - (e) Another public organisation: _____months
 - (f) Private / commercial training institutes _____months
 - (g) Other: _____months

Please insert the internet links of the programs if possible:

- (16) Which body/bodies provide the individual continuing education courses (referred to in question 14b) in Clinical Neuropsychology in your country?
- (a) Universities

- (b) National ministry / health department / authority
- (c) National psychological association
- (d) National neuropsychological society
- (e) Another public organization:
- (f) Private / commercial training institutes
- (g) Other:

(17) Is a practical training period included in the program in your country?

- (a) No
- (b) Yes

If yes, length in months or hours:

(18) Is Clinical Neuropsychology situated in another profession than Psychology in your country?

- (a) No
- (b) Yes

If yes, please name:

(19) In your opinion, what would be the best model for professional specialization required to practice Clinical Neuropsychology in your country?

(20) Would you support the idea of the EuroPsy specialist certificate in Clinical Neuropsychology? (see <http://www.europsy-efpa.eu/faq>)

- (a) No
- (b) Yes

If yes, in which way (elaborate your answer/your wish):

Section C: The number of Clinical Neuropsychologists and their role in Health Care

(21) How many active Clinical Neuropsychologists are there in your country?

- (a) Approximate number of Clinical Neuropsychologists:
- (b) Approximate number of academics/researchers in the field of Neuropsychology:

The numbers above rely on:

- (a) Official statistics/directories

Please specify source:

- (b) Personal estimate

(22) Do you need a specific licensure by competent authorities to practice Clinical Neuropsychology in your country?

- (a) No
- (b) Yes

If yes, please elaborate:

(23) Which professionals conduct formal / full neuropsychological assessments in your country? (Please choose as many as applicable)

- (a) Neuropsychologists with a psychologist's background
- (b) Psychologists of other specialties

Please elaborate:

- (c) Speech and Language Therapists/Pathologists
- (d) Occupational Therapists
- (3) Neurologists
- (f) Psychiatrists
- (g) Geriatric doctors
- (h) Developmental Paediatricians/Paediatricians
- (i) Nurses
- (j) Other medical practitioners

Please elaborate:

- (k) Other Professions

Please elaborate:

(24) Which professionals conduct cognitive screenings, such as MMSE, short port concussion testing etc. in your country? (Please choose as many as applicable)

- (a) Neuropsychologists with a psychologist's background
- (b) Psychologists of other specialties

Please elaborate:

- (c) Speech and Language Therapists/Pathologists
- (d) Occupational Therapists
- (e) Neurologists
- (f) Psychiatrists
- (g) Geriatric doctors
- (h) Developmental Paediatricians/Paediatricians
- (i) Nurses
- (j) Other medical practitioners

Please elaborate:

- (k) Other Professions

Please elaborate:

(25) Are Clinical Neuropsychologists subordinate to any other professions in their clinical work in your country?

- (a) No
- (b) Yes

If yes, which professions and in what way:

(26) Can Clinical Neuropsychologists independently diagnose using DSM 5 / ICD-10 in the health care system in your country?

- (a) Yes
- (b) No

If no, please elaborate:

(27) Can Clinical Neuropsychologists do independent neuropsychological rehabilitation and psychological treatment in the health care system in your country?

- (a) Yes
- (b) No

If no, please elaborate:

(28) Can Clinical Psychologists or Clinical Neuropsychologists be the head of multidisciplinary departments, divisions or clinics within the public health care system in your country?

- (a) Yes
- (b) No

If no, please elaborate:

(29) Do Clinical Neuropsychologists mostly conduct diagnostic work or rehabilitation/treatment in the health care system in your country?

- (a) Mostly diagnostic work
- (b) Mostly rehabilitation/treatment
- (c) Similar amount of diagnostic work and rehabilitation/treatment

(30) Are there official subspecializations that can be practiced within the field of Clinical Neuropsychology in your country?

- (a) No
- (b) Yes

If yes, please specify:

(31) Please rank the following applications of Clinical Neuropsychologists in your country from the most common (1) to the least common (6), based on the target population/context of practice.

- (a) Adult Clinical Neuropsychology
- (b) Paediatric/Child Neuropsychology
- (c) Geriatric Neuropsychology
- (d) Forensic Neuropsychology
- (e) Educational Neuropsychology
- (f) Other:

(32) Please rank the following applications of Clinical Neuropsychologists in your country from the most common (1) to the least common (5), based on the type of practice:

- (a) Neuropsychological Evaluation/Assessment
- (b) Neuropsychological Rehabilitation/Intervention/Therapy
- (c) Neuropsychological Consultation
- (d) Neuropsychological Research
- (e) Other:

Section D: Service providers and Access to Diagnostics and Treatment

(33) Which public institutions offer Clinical Neuropsychology services in your country? (Please mark with inpatient, outpatient or both)

- (a) Public hospitals (acute illness) - (inpatient, outpatient, both)
- (b) Health centres - (inpatient, outpatient, both)
- (c) Other institutions of the national health care system; please specify: _____ - (inpatient, outpatient, both)
- (d) Public rehabilitation centre - (inpatient, outpatient, both)
- (e) Public reintegration and occupational trainings centres - (inpatient, outpatient, both)
- (f) Other:

- (34) How are Clinical Neuropsychology appointments/consultations usually paid for in public institutions in your country?
- (a) Entirely by the patient
 - (b) Entirely by public entities⁵ (also consider this option when patients/clients pay up front, but are fully reimbursed later)
 - (c) Entirely by private entities⁶ (also consider this option when patients/clients pay up front, but are fully reimbursed later)
 - (d) The patient pays a part, whereas public entities pay the remaining
 - (e) The patient pays a part, whereas private entities pay the remaining
 - (f) Other:
- (35) How are neuropsychological appointments/consultations usually paid for in private institutions (e.g. practice) in your country?
- (a) Entirely by the patient/client
 - (b) Entirely by public entities⁷ (also consider this option when patients/clients pay up front, but are fully reimbursed later)
 - (c) Entirely by private entities⁸ (also consider this option when patients/clients pay up front, but are fully reimbursed later)
 - (d) The patient pays a part, whereas public¹ entities pay the remaining
 - (e) The patient pays a part, whereas private² entities pay the remaining
 - (f) Other:
- (36) Is there anything you want to add referring to the whole survey?
Please elaborate:

Appendix 2. Letter of recommendation

Dear representatives of EFPA Member Associations!

The European Federation of Psychological Associations (EFPA) has established a Task Force on Clinical Neuropsychology based on the situation described below.

The level of training and the practice of Clinical Neuropsychology throughout Europe is quite variable. An important implication of this is that the population in European countries receives neuropsychological health services at different levels, despite largely comparable panorama of diseases and disabilities. The variable level of training and formal competency in Clinical Neuropsychology in Europe also represents a problem for European Psychologists because Europe and EU in principle is one common job market. In the current situation, with quite variable competencies, the idea of one common job market is not realistic, as employers and certain countries would have little interest in employing applicants from countries with less advanced training in Clinical Neuropsychology. Thus, there is a need for a European calibration regarding training and education in Clinical Neuropsychology. Such calibration will ensure a common European high standard of training to make certain that neuropsychological assessment and treatment throughout Europe is conducted according to certain minimum standards. Furthermore, a calibration of training and education will ensure that credentials obtained in one European country realistically qualify a candidate for work in other European countries.

The main responsibilities of the Task Force are:

- (1) to collect information on the current situation on the specialization training within clinical neuropsychology in the different countries of Europe – both in the universities and in the clinical practice.
- (2) to collect information on the legal and professional status of clinical neuropsychologists within the profession of psychologists in different European countries.
- (3) to present the information and best examples to the EFPA Member Associations.
- (4) to make recommendations as how the specialization training in neuropsychology can and/or should be developed in the future.

To achieve its objectives the EFPA Task Force on Clinical Neuropsychology has developed the attached survey that all the national Psychological Associations and all the national Neuropsychological Societies in Europe are asked to complete.

On behalf of the EFPA Task Force, we sincerely hope that all the member associations and societies will collaborate in this effort and complete the survey within the deadline.

Sincerely,

Laura Hokkanen, chair of the EFPA Task Force on Clinical Neuropsychology

Erik Hessen, President, Federation of the European Neuropsychological Societies FESN