

Special Article - Palliative Care

The Reasons that Lead to Entry into a Post-Graduate Course in Palliative Care (PC): A Study of Doctors and Nurses in Italy

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Abstract

Purpose: A few studies have been carried out to understand the motivations which lead some health professionals to engage in PC training. The issue assumes relevance since appropriate teaching plans can be created based on training expectations and, at the same time, a vision of PC can be investigated through the analysis of expected training patterns.

Methods: 132 doctors and 149 nurses who were candidates to the entrance tests to post-graduate courses in PC that have been organized by the Accademia delle Scienze di Medicina Palliativa (ASMEPA) in the years 2006-2014, were asked the following question "What are your main motivations to enter this course?". The authors carried out quantitative analysis (occurrences and co-occurrences as well as word associations) and qualitative analysis (core themes or cluster) on the responses.

Results: The most frequent keywords were: learning, professional achievement, and palliative care. The thematic clusters in order of frequency were: how to approach, enhancement of nursing practice, professional achievement, sharing/cooperative working.

Conclusions: The cluster how to approach shows how health professionals believe that PC, that is the medicine of the care, involves different behaviors from those which characterize the medicine of the cure. The cluster enhancement of nursing practice highlights the need for the development of specific concepts related to management in PC. The cluster professional achievement has little relevance; it was mainly chosen by doctors and it is not a constituent part of the educational context of the training. The cluster sharing/cooperative work emphasizes the importance of teamwork.

Keywords: Palliative care; Motivation; Cluster analysis; Word association analysis; Occurrence analysis; Co-occurrence analysis

Introduction

PC represents an ever growing area of social interest, but the definition of the discipline and its integration into the clinical setting is still open to debate [1].

In Western countries, the number of health care facilities is increasing, but organizational models and the basis of staff training aren't always homogeneous [2].

In this situation, many doctors and nurses wish to enter the field of PC, but what makes these health care professionals start a training path in a field that someone calls a room for confusion [3].

Understanding motivations can be useful not only to modify teaching according to expectations, but also to better understand the PC vision of the health care professionals wishing to enter this field. The Accademia delle Scienze di Medicina Palliativa (ASMEPA), together with the University of Bologna, is trying to contribute to the development of university curricula in Italy with post-graduate courses and refresher courses [4].

We investigated the motivations of doctors and nurses who have applied for these courses since 2006 using a questionnaire that was administered to them while they were taking their admission tests.

Methods

ASMEPA is a private organization that operates in cooperation with the University of Bologna with the aim of spreading the culture of PC through training and research programs [5].

From 2006 to 2014, ASMEPA organized two-year post-graduate courses in PC; on average each course consisted of a total of 750 hours: 380 hours of lectures and 350 hours of internships in residential facilities (Hospice).

Analysis of data

Before taking the admission test, candidates were asked to answer a questionnaire whose main question was "What are your main motivations for taking this course?"

Answers from 132 doctors (53 M, average age 47.47; SD 8.17; 79 F average age 40.5; SD 8.0) and 149 nurses (19 M, average age 37.79;

Table 1: Keyword list elaborated by t-lab 9.1 according to lemmatization, disambiguation and multiword listing processes. Occurrences represent how many times a word occurs in all the analyzed text.

ITEM	OCCURRENCES	ITEM	OCCURRENCES
LEARNING	368	MANAGEMENT	35
PROFESSIONAL_ACHIEVEMENT	345	ORGANIZATION	32
PALLIATIVE_CARE	134	HIGHER	31
HOSPICE	93	PERSONAL	31
TRAINING	86	ONCOLOGY	30
CURE	84	NECESSITY	30
COOPERATION	73	TERMINALITY	29
HEALTH_CARE	57	PATHWAY	28
MEDICINE	53	THERAPY	24
PATIENT	52	TIME	24
SKILLS	49	REQUIREMENT	23
SETTING	47	CARING_ENHANCEMENT	22
MASTER	47	APPROACH	22
ILL	46	ACTIVITY	21
OPPORTUNITY	40	REALITY	21
MOTIVATION	39	PAIN	20

SD 7.05; 130 F, average age 36.20, SD 9.17) were available for analysis. 86 doctors (64.8%) and 71 nurses (47.6%) said that they had already had experience in palliative care, doctors for an average of 5.6 years (range 1-25 years) and nurses for an average of 3.6 years (range 1-16 years). A content analysis of all the answers was conducted using T-Lab9 software (T-LAB, copyright 2001-2016, via Montello 117, 03038 Roccasecca, Italy, FAX: +39 0775 1800170) (<http://tlab.it/it/presentation.php>).

The aim of the analysis was to identify a limited cluster of the most frequently used words. Data were initially processed in order to reduce its uselessness rate through text disambiguation procedures that is by excluding from the analysis all lexical forms that could distort the meaning of the analysis results. We conducted the procedure by:

Identifying a stop word list. In text analysis practice, many words are colloquially defined empty words (as opposed to content words). The stop word list included terms that are correct for the formulation of a sentence but that can't give any information about its content [6].

- Identifying multiword expressions. By means of this procedure, we selected all groups of two or more words that have meaning as a unit, such as compound nouns.

- The list of multiword expressions has been implemented in T-Lab by software producers relying on two criteria:

(a) limiting the most frequent ambiguity cases (effectiveness criterion).

(b) reducing the rates of execution of the normalization procedure (efficiency criterion).

The following analyses were conducted:

Occurrence and co-occurrence [7-9]

This method evaluated how often a word appeared in the

questionnaire answers and how often two or more words appeared together in the same basic context.

Word association analysis [10-13]

This method was used to verify how the contexts of co-occurrence affected the meaning in the context of key words in order to deduce from the conceptual frame work a specific discipline field.

The method of building thematic or lexical maps usually proceeds in two steps, first creating a list of lexical units used in a specific lexicon and second, recognizing systematic relationships between these units.

The word association index is shown on a radial map where the key word is set in its center and the other related words are displayed around it at a distance proportional to their association index [14]. That means that the closer the key words are to the word in the center, the more frequent their co-occurrence with the key word is. The strength of the associations between key words was assessed using the X^2 test.

Cluster analysis

We carried out a cluster analysis to identify groups of objects with complementary characteristics. Hierarchical methods were used for co-word analysis and cluster analysis [15,16]. The analysis process was conducted through a bisecting K-Means algorithm appropriate for text reading methodology.

In T-Lab, a seven-step routine makes it possible to analyze associations between lexical terms and to compare the strength of such associations to build core themes called clusters.

Theme or lexical charts were constructed in two steps: first, the lists of key words were identified, then systematic relationships between them were analyzed in order to create a concept map, which can be considered a summary that shows explicitly the main words around which the content of the answers is aggregated [17,18].

First, an analysis of the concept map was been carried out, and then multiple relationships were examined through a multidimensional scaling process that provided a visual output. The model helped to inform the subsequent steps of gathering words and themes into clusters [19]. We evaluated the quality of the resulting clusters through the Calinski-Harabasz index [20].

In order to detect possible differences related to profession, two categories were created using the profession as a grouping variable, that is, doctors and nurses.

The analyses were conducted on 118 of 139 answers from the doctors (85%) and 119 of 149 answers from the nurses (80%).

Results

Analysis of occurrences

On the basis of the software settings, we identified 35 key words (Table 1) as descriptor of the whole corpus. An Equivalence Index is used to calculate the value of togetherness between two keywords. Keywords that have a high correlation value based on an equivalence index are chosen as the central of a cluster. Keywords that appear at the top level are known as mediator words.

The three most frequent words were: (1) learning, that is the need

Table 2: Cosine's coefficient of word associations for the word "Learning".

Keyword: Learning (A)	COEFF.	E.C.(A)	E.C.(AB)	CHI ²
Personal (B)	0,234	31	21	4,329
Hospice (B)	0,353	90	54	4,685
Professional_achievement (B)	0,528	240	132	5,13
Palliative_care (B)	0,416	125	75	7,078
Skills (B)	0,293	46	32	8,026

Table 3: Cosine's coefficient of word associations for the word "Professional achievement".

Keyword: Professional Achievement (A)	COEFF	E.C.(A)	E.C.(AB)	CHI ²
Learning (B)	0,528	20	5	5,13
Hospice (B)	0,367	260	132	8,825
Time (B)	0,25	90	54	11,28

Table 4: Cosine's coefficient of word associations for the word "Palliative care".

Keyword: palliative care (A)	COEFF	E.C.(A)	E.C.(AB)	CHI ²
Time (B)	0,201	24	11	6,689
Learning (B)	0,416	260	75	7,078
Therapy (B)	0,234	21	12	13,346
Medicine (B)	0,283	44	21	15,07
Cure (B)	0,71	80	71	218,898

to improve one's personal knowledge, (2) professional achievement, as enhancement of one's professional profile, (3) palliative care, that is the field where learning needs are identified.

Analysis of word association (Co-word analysis)

Based on the co-occurrence of pairs of words, co-word analysis seeks to extract themes and detect the linkages among these themes directly from the subject content of texts. With the text corpus as input, T-LAB converts each word into a lemma (or lexical root) and makes distinctions between various grammatical categories such as verb, noun, and adjective.

Co-word analysis calculates the co-occurrence pairs of items and defines their association by X² analysis. We performed association analysis for all of the 35 keywords, in Tables 2-4 we reported significant association between the three most frequent keywords and other keywords related to them having a significant association index (cosine similarity) and a X² value < 0.5. The similarity of the cosine, or cosine similarity, is a heuristic technique for measuring the similarity between two vectors performed by calculating the cosine of the angle between them, generally used for the comparison of texts in data mining and in text analysis. It is usually represented by radial graphs as reported in Figures 1-3, the graphs and maps produced by T-LAB are labeled using the lemmas (lexical units), which serve as units of analysis. In text analysis the frequencies of the terms are always positive values, so coefficient values range from 0 to +1, where +1 indicates that the two words co-occur ways together and 0 that there is no co-word occurrences. As regards to the word learning, it can be noticed that the highest coefficient of association relates to the words palliative care and professional achievement: this indicates how often the two terms appear in the same answers. The analysis of the terms that relate to professional achievement in a way

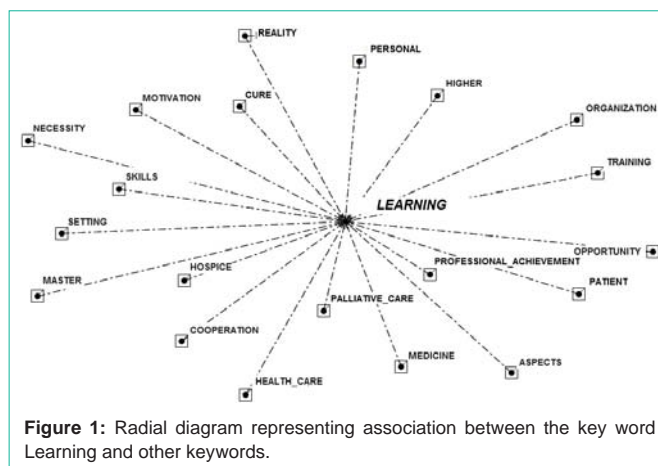


Figure 1: Radial diagram representing association between the key word Learning and other keywords.

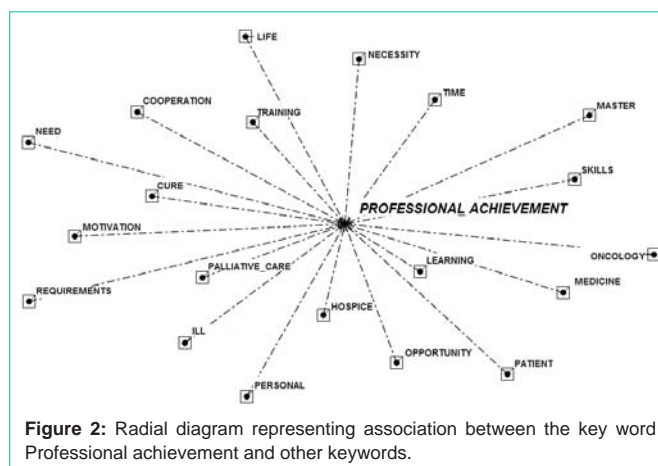


Figure 2: Radial diagram representing association between the key word Professional achievement and other keywords.

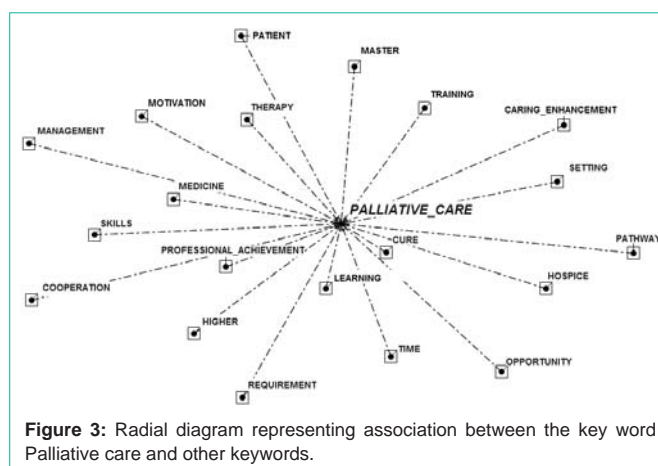


Figure 3: Radial diagram representing association between the key word Palliative care and other keywords.

that is statistically significant provides further evidence of the close relationship between the concept of learning and that of professional achievement. A visual map was generated to show the other key terms that co-occurred with the term Learning, Palliative care, Professional achievement in the center (Figure 1-3). We observe the presence of a consistent set of knowledge and skill themes in the corpus.

Cluster analysis

239 basic contexts out of 281 (85%) have been classified to identify the clusters. The analysis has initially shown a possible structure with

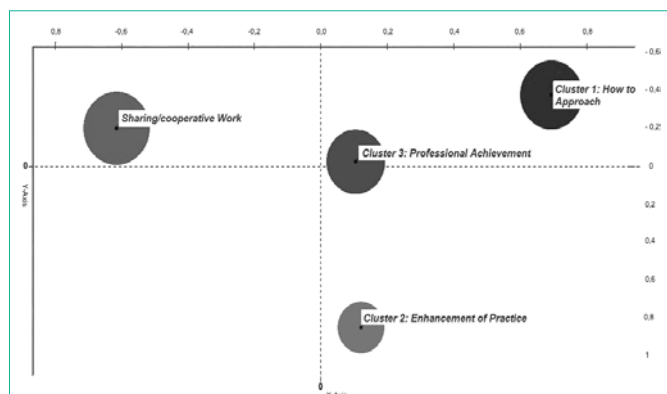


Figure 4: Visual representation of meaningful cluster on Cartesian axes. The shorter the distance from the center of the axes, the lower the semantic contribution of the cluster.

ten clusters, each of them with its own importance in defining the categories tracked in the text. However the only partition model where there isn't any overlap between clusters is a model with 4 clusters. So, through independent evaluations we identified 4 clusters which can describe the set of terms contained in each of them:

Cluster 1: How to approach (152 elementary context = 35.4%).

Cluster 2: Enhancement of nursing/caring practice (114 elementary context = 26.7%).

Cluster 3: Professional Achievement (96 elementary context = 22.4%).

Cluster 4: Sharing / Cooperative working (67 elementary context = 16.6%).

Clustering procedures used in data mining approach, allows to determine the relative weight of each cluster on general dataset, thus each weight represent the frequencies of clustered word that appear in the lexical units. The relative importance of each cluster is a function of the distance from the coordinate axes as shown in Figure 4. The greater is the distance from the origin of the coordinate axes, the greater is the importance of that cluster in the answers to the questionnaire as a whole. In order to evaluate differences in the importance of the cluster analysis between doctors and nurses, we performed a separate analysis of the answers of the two professional settings. The thematic structure can largely overlap the general structure, although the professional achievement theme isn't explicitly recognized in the nurses' questionnaires but through the themes related to it (Table 5).

Discussion

With this study we have tried to understand what motivational

factors lead doctors and nurses to improve their training in PC. This issue has been recently tackled in the literature. The few existing publications had contradictory and inconclusive results and arose from research conducted in the Anglo-Saxon countries [21-23]. Little information are available from the Mediterranean area. The applied methodologies aimed to determine thematic aggregations useful to identify the main inner motivational factors. We used textual analysis techniques, which were aimed at describing the concepts expressed in answers to a questionnaire by each participant taking in the admission test for a post-graduate course in PC. In this way, both qualitative (i.e. motivations and expectations) and quantitative information was collected through the calculation of occurrences of key words and phrases within all the material collected. Keyword identification, analysis of occurrences, and co-word analysis were all necessary steps for determining semantic clusters. The three most frequent keywords and phrases were learning, professional achievement and palliative care, indicating that answers were mostly oriented toward describing professional commitment in the PC field and the need to acquire deeper knowledge and further skills in this field. Interestingly, these 3 concepts were significantly associated among themselves and also with words like time, medicine, and cure. The step following word association led to the identification of four clusters of words that, in order of importance, were: how to approach, enhancement of nursing practice, professional achievement, sharing/cooperative working.

In the cluster how to approach, a motivation emerged related to learning the typical features of working in PC, in particular, team work, patient centrality, personalized nursing practice, a multidisciplinary approach and, generally speaking, humanization of care. It is assumed that the skills and competences related to these issues can be primarily acquired through mentoring, thereby suggesting that lectures are less relevant than hands-on training.

The cluster enhancement of nursing practice highlights the need for specific training of PC professionals in the field of organization management to tackle themes peculiar to PC like psychological support for patients and families, such as in the management of grief. It's clear that these two clusters are closely related to each other with regards to both characteristic lemmas and the body of knowledge and soft skills.

In the cluster how to approach the need emerges for a component constituent more strictly related to clinical aspects, whereas in the cluster enhancement of nursing practice, the organization/managerial component is prevalent. These two clusters also show a vision of PC as an area that requires specific training to provide adequate care. As a matter of fact, the identification of the cluster how to approach, which had the greatest importance among all the clusters identified in this study, shows that professionals believe that PC, that is medicine of the care, requires practice and skills different from those which

Table 5: Themes emerged from total database and distinguished for doctors and nurses.

Clusters from full database	Clusters from Doctors' answers	Clusters from nurses' answers
Cluster 1: How to approach	Cluster 1: How to approach	Cluster 1: How to approach
Cluster 2: Enhancement of nursing / caring practice	Cluster 2: Professional Achievement	Cluster 2: Enhancement of nursing / caring practice
Cluster 3: Professional Achievement	Cluster 3: Sharing / Cooperative working	Cluster 3: Knowledge improvement
Cluster 4: Sharing / Cooperative working	Cluster 4: Enhancement of nursing / caring practice	Cluster 4: Sharing / Cooperative working

characterize the medicine of the cure, thereby indicating the need for a specialist area. In this context the component related to fieldwork is prevalent; learning arises mainly from “learning by doing”, that is learning through the process of doing activities, and from “learning by thinking”, that is from activity accompanied by thought and reflection, internalizing actions and becoming aware of them.

The cluster sharing/cooperative working emerges from an area consisting of motivation, needs, training, gaps and deficiencies. It highlights a precise method of transferring skills and competencies that can also occur through informal learning and comparing professional experiences. The cluster highlights the need for common work tools and experience and for sharing models on cooperative working, that is to be understood as working with others, actively contributing to the attainment of a goal; these are elements which can better emerge from a direct exchange of views between professionals.

Finally the cluster professional achievement, which contains the interest in attaining a certification, was expressed both implicitly and explicitly. Some candidates didn't declare that they are interested in the certification, but a certain interest was apparent from the matching with the key words. This cluster is the only one that doesn't address the need for training or knowledge transfer, but it suggests a need for professional achievement by means of professional acknowledgement.

An analysis of the results by profession suggests a subtle difference with regard to key themes and this probably also reflects possible expectations related to the profession. As a matter of fact, the need for professional enhancement represented a more marked component in doctors' responses, whereas nurses showed a greater need for skills development within a training system that promotes sharing and comparison of professional experience.

On the basis of these different expectations, it can be assumed that a multidisciplinary approach in PC training is essential, but it must be applied methodically: it is therefore important to differentiate training paths according to each profession's needs and expectations, with the possibility of providing moments of common classroom training (in particular with active teaching such as group work and the discussion of clinical cases) so as to make “peer to peer” training effective.

In general, the four clusters that emerged from this study suggest that the decision to undertake a course in PC is supported by both intrinsic and extrinsic motivations to learn that jointly give rise to and support “learning behavior”.

The present work is based on textual and qualitative methods of analysis in the design and planning of post-graduate and post-specialist training offerings. One aim of the work was to rank the answers of candidates to a post-graduate course in PC about their motivations in a synthetic but at the same time sufficiently exhaustive order and to find implications for the organization of expected training plans.

This study suggests that professionals in Italy wishing to improve their knowledge of PC bring to the fore mainly the idea that the field needs a specific training process that has to include field training, cultural integration and a multi-professional mode.

References

1. Doyle D. Palliative medicine: the first 18 years of a new sub-specialty of general medicine. *J.R. Coll Physicians Edinb.* 2005; 35: 199-205.
2. Elsner F, Centeno C, De Conno F, et al. Recommendation of the European Association of Palliative Care for the development of post-graduate curricula leading to certification in palliative medicine. Report of the EAPC. Task Force of medical Education. Milan, Italy, EAPC. 2007.
3. Fallon M, Smyth J. Terminology, the historical perspective, evolution and current usage –room for confusion? *Eur J Cancer.* 2008; 44: 1069-1071.
4. Moroni M, Bolognesi D, Muciarelli PA, Abernethy AP, Biasco G. Investment of palliative medicine in bridging the gap with academia: a call for action. *Eur J Cancer.* 2011; 47: 491-495.
5. Bolognesi D, Brighi N, Muciarelli PA, Biasco G. Palliative care training and research: the development in Europe and the Bologna experience. *Indian J Palliat Care.* 2013; 19: 20-26.
6. Mussino R. Non tutto, ma di tuttosullastatisticasociale. *Appunti per l'analisi di dati di area sociale.* Roma, Nuova Cultura. 2015.
7. Wang Z, Li G, Li CY, Li A. Research on the semantic-based co-word analysis. *Scientometrics.* 2012; 90: 855-875.
8. Surjandari I, Dhini A, Wibisana N, Lumbantobing EW. University research cluster mapping: a co-word analysis of scientific publications. *IJTech.* 2015; 6: 410-421.
9. Wang Z, Zaho H, Wang Y. Social networks in marketing research 2001–2014: a co-word analysis. *Scientometrics.* 2015; 105: 65-82.
10. Church WK, Hanks P. Word association norms, mutual information, and lexicography. *comput linguist.* 1990; 16: 22-29.
11. Scott M. Comparing corpora and identifying keywords, collocations, frequency distributions through the WordSmith Tools suite of computer programs. In: Ghadessy M, Henry A, Roseberry L. *Small Corpus Studies and ELT.* Amsterdam: John Benjamins. 2001.
12. Feldman R, Sanger J. *The Text Mining Handbook: Advanced Approaches in Analyzing Unstructured Data.* Cambridge: Cambridge University Press. 2007.
13. Mahgoub H, Rosner D, Ismail N, Torkey F. A Text Mining Technique Using Association Rules Extraction. *Int J Comput Int.* 2008; 4: 21-28.
14. Jaccard's index and species diversity. Accessed January 17. 2015.
15. Bolasco S. Statistica Testuale e Text mining: alcuni paradigmi applicativi. *Quad Stat.* 2005; 7: 17-52.
16. Kaufman L, Rousseeuw PJ. *Finding Groups in Data: An Introduction to Cluster Analysis.* Hoboken, New Jersey: John Wiley & Son. 2009.
17. Marshakova-Shaikovich I. Bibliometric maps of field of science. *Inf Process Manag.* 2005; 41: 1534–1547.
18. Assefa SG, Rorissa A. A Bibliometric Mapping of the Structure of STEM Education using Co-Word Analysis. *J Assoc Inf Sci Technol.* 2013; 64: 2513–2536.
19. Lancia F. *Strumenti per l'analisi dei testi. Introduzione all'uso di T-LAB.* Milano: Franco Angeli. 2004.
20. Calinski RB, Harabasz J. A Dendrite Method for Cluster Analysis, *Commun Stat Theory Methods.* 1974; 3: 1-27.
21. BachalJamali M, Ram N, Shaikh KH, Shaikh FM. A comparison of motivation level of post graduate students at university of Sindh Jamshoro. *AJBMR.* 2011; 1; 167-173.
22. Lam TP, Lam KF, Tse EYY. Why do primary care doctors undertake postgraduate diploma studies in a mixed private/public Asian setting? *Postgrad Med J.* 2006; 82: 400–403.
23. Miller J, Bligh J, Stanley I, Al Sheri A. Motivation and continuation of professional development. *Br J Gen Pract.* 1998; 48: 1429–1432.