

Knowledge of haematological toxicities amongst European nurses – a learning needs assessment

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ABSTRACT

Haematological toxicities such as neutropenia, anaemia and thrombocytopenia have a significant impact on patients with cancer. They can have a life-threatening effect on the health of the patient and, importantly, may lead to the interruption and/or dose reduction of ongoing cancer therapies, such as chemotherapy. Nurses play a pivotal role in haematological toxicity prevention, detection and management, however, the current level of involvement and understanding varies widely across Europe. Continuing Professional Education (CPE) is an important tool in maximising nurses' contributions to such healthcare issues, enabling them to maintain awareness of recent research, refreshing their knowledge, and facilitating consistency of best practice. As such, the European Oncology Nursing Society (EONS) is developing a Europe-wide training programme in haematological toxicities. This is based on the unmet CPE needs identified through a Learning Needs Assessment (LNA) carried out amongst European cancer nurses in 2003. This article discusses the results of the LNA and how the key issues that it has revealed are being addressed in EONS' nurse education programme, 'Training Initiative in Thrombocytopenia, Anaemia and Neutropenia (TITAN)'.

KEY WORDS

Anaemia

Continuing Professional Education

Haematological toxicities

Learning needs assessment

Neutropenia

INTRODUCTION

Haematological toxicities such as thrombocytopenia, anaemia and neutropenia, can have a significant impact on the general health of patients with cancer and, in addition, may result in the need to interrupt or reduce the dose of cancer treatments such as chemotherapy and radiotherapy (Bonadonna et al, 1995). Such reductions and delays can potentially impact quality of life and ultimately treatment outcomes for the patient (Groopman & Itri, 1999; Schwartzberg et al, 2002). The European Oncology Nursing Society (EONS) believes that priority should be given to raising awareness about haematological toxicities – a priority that matches well with EONS’ vision of quality cancer care and excellence in cancer nursing practice. This has led to the development of the Training Initiative in Thrombocytopenia, Anaemia and Neutropenia (TITAN) programme. Previous nurse education initiatives have been shown to positively contribute to the quality of patient care (Hooker and Milburn, 2000). Furthermore, incorporating clinical evidence within education programmes is important as nurses are increasingly becoming active decision makers in the clinical environment (Thompson et al, 2004).

EONS was aware that the US Oncology Nursing Society (ONS) had developed and implemented a programme dedicated to haematological toxicities called ATAQ (Appropriate Treatment Assures Quality). This highly successful programme has been in place for more than four years. ATAQ now exists principally as a series of web-based lectures, supporting electronic resources, and a three-day national conference. The objectives of the core elements of ATAQ are shown in Table 1 and compared to the current areas of focus for TITAN. In May 2003, representatives from EONS met with leaders of the ATAQ initiative at the ONS Congress, with the aim of learning more about ATAQ and investigating its suitability for European audiences. As a result of this initial meeting, a Working Group was established to oversee the development of TITAN. The process involved an expert evaluation of the current ATAQ programme and, importantly, a study of the learning needs of nurses in Europe in relation to haematological toxicities. Nursing practice differs between the US and Europe, as well as within Europe, which the working group felt was essential to understand for the development of a Europe-wide training initiative. The working group commissioned a learning needs assessment (LNA) of European Oncology nurses, which sought to gain insight into the current knowledge levels in relation to haematological toxicities. In addition, the assessment would serve to identify the specific aspects of those toxicities about which European nurses were interested in learning more. A similar learning needs assessment looking at knowledge and attitudes towards fatigue in the oncology setting had previously been undertaken (Miller and Kearney, 2001).

Table 1: Similarities in objectives between ATAQ and TITAN

Appropriate Treatment Assures Quality	Training Initiative in Thrombocytopenia, Anaemia and Neutropenia
<p>Risk assessment and risk models for haematological toxicities:</p> <ul style="list-style-type: none"> • Describe the risk and cost of neutropenia in cancer patients 	<p>Neutropenia A–Z:</p> <ul style="list-style-type: none"> • Outline the causes, incidence and duration of neutropenia in patients with cancer

<ul style="list-style-type: none"> • Identify the risk factors for neutropenia and its consequences • Discuss clinical prediction models • Describe currently available risk models for neutropenia complications 	<ul style="list-style-type: none"> • Describe the signs/symptoms associated with neutropenia • Explain the potential consequences of neutropenia in cancer patients <p>Anaemia A–Z:</p> <ul style="list-style-type: none"> • Outline the causes, incidence, and signs/symptoms of anaemia • Describe the impact of anaemia on cancer patients • Outline risk factors for anaemia in cancer patients • Describe currently available anaemia risk models • Undertake evidence-based assessments to identify patients at risk of anaemia • Carry out a comprehensive assessment of patients with anaemia <p>Thrombocytopenia A–Z:</p> <ul style="list-style-type: none"> • Outline the causes, incidence and signs/symptoms of thrombocytopenia • Describe the clinical consequences of thrombocytopenia • Identify patients at risk of thrombocytopenia • Outline the criteria for the comprehensive assessment of patients with thrombocytopenia • Delineate the risks associated with platelet transfusions • Employ bleeding precautions to prevent complications associated with thrombocytopenia
<p>Clinical guidelines and evidence for risk assessment and interventions:</p> <ul style="list-style-type: none"> • Identify evidence-based guidelines for care • Discuss application of guidelines to clinical care • Describe evidence for risk assessment in myelosuppressed 	<p>Neutropenia risk management:</p> <ul style="list-style-type: none"> • Outline risk factors for neutropenia • Describe currently available neutropenia risk models • Undertake evidence-based assessment to identify patients at risk of neutropenia • Employ evidence-based and proactive

<p>patients</p>	<p>nursing strategies to prevent and manage neutropenia in at-risk patients</p> <ul style="list-style-type: none"> • Discuss the rationale behind the use of growth factors to prevent neutropenia • Describe the criteria for the safe administration of growth factors and monitoring of patients for treatment side effects <p>Febrile neutropenia:</p> <ul style="list-style-type: none"> • Identify neutropenic patients most at risk of sepsis • Describe the criteria for the comprehensive assessment of a febrile neutropenic patient • Discuss the management of common infections in the neutropenic patient • Outline evidence-based nursing strategies to prevent infection in the hospitalised neutropenic patient. <p>Anaemia risk management:</p> <ul style="list-style-type: none"> • Identify evidence-based anaemia treatment triggers • Describe the rationale behind the use of growth factors in the management of anaemia • Describe the criteria for the safe administration of growth factors and monitoring patients for side effects • Delineate the risks associated with blood transfusions • Employ evidence-based and proactive nursing strategies to prevent and manage anaemia in at-risk patients
<p>Educating patients, the public, and providers about hematologic toxicities:</p> <ul style="list-style-type: none"> • Discuss a variety of teaching methods to use with patients, the public and provider • Explore innovative strategies to use when teaching patients, the public and providers 	<p>Patient education:</p> <ul style="list-style-type: none"> • Outline the principles of patient education • Identify the key challenges in educating patients with haematological toxicities • Explore innovative and creative strategies to educate patients and their families

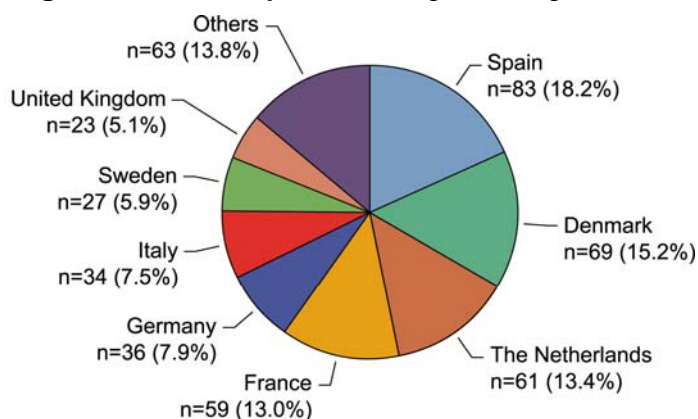
<ul style="list-style-type: none"> • Recognize available haematological toxicities resources for educating patients, the public and providers • Identify barriers to learning 	<ul style="list-style-type: none"> • Evaluate high quality resources available for educating patients and their families
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This article discusses the main findings of the LNA, outlining key findings that have been important in developing a Europe-wide education programme. The assessment looked to identify points of consensus amongst the actual and perceived needs of nurses across Europe. Whilst some of these consensus points are noted, country specific differences are highlighted.

METHODOLOGY AND CHARACTERISTICS OF THE TARGET GROUP

The LNA questionnaire was developed by a small EONS working group with experience in qualitative research techniques. However due to time constraints the tool was not pilot tested, but rather was reviewed by a panel of nurse experts. The questionnaire was distributed at ECCO 12, Copenhagen (21–25 September 2003), taking advantage of a high concentration of European oncology nurses in attendance. In addition, the questionnaire was mailed to members of national nursing societies in countries not well represented at ECCO (including France, Italy Germany, and Spain). In all, 455 respondents from 22 countries (see Figure 1) completed the questionnaire, of which 319 were completed at ECCO 12. (Respondents from non-European countries accounted for only 6 out of 455.)

Figure 1: LNA respondents by country



[‘Others’ includes Algeria, Australia, Austria, Belgium, Estonia, Finland, Greece, Iceland, Ireland, Luxembourg, Norway, Portugal, South Africa, Switzerland]

Figure 2 and Table 2 outline the demographics of the respondents, providing the age, number of years in nursing/oncology nursing and the specific oncology setting.

The majority of respondents were aged between 30 and 50 years (77.4%), although the UK and Italy had a relatively high percentage of respondents under 30 (26.1% and 17.6% respectively). On average, respondents were experienced oncology nurses (18.2 years in nursing and 11.1 years in oncology nursing).

42.9% of respondents were oncology nurses, and a further 16.3% regard themselves as clinical nurse specialists (encompassing a range of oncology and non-oncology disciplines). The vast majority of nurses cared for patients in an inpatient and/or outpatient hospital setting (63.1% and 40.9% respectively). Other settings included nursing schools, home care, hospices, various cancer centres, and management/administration roles. 74.5% of respondents currently care for patients receiving chemotherapy, dealing with an average of 35.3 patients (range by country: 8.1–69.8) per week. It should be noted, however, that there were large country-specific variations in reported oncology settings and nursing positions, which may reflect variability in the types of nursing staff from different countries that secure support to attend international conferences. For example, 75.0% of respondents from Germany were lecturers or clinical teachers, while only 13.9% were oncology nurses. In contrast, the position of oncology nurse was held by 54.2% and 59.3% of Spanish and Swedish respondents respectively.

Figure 2: Respondent age

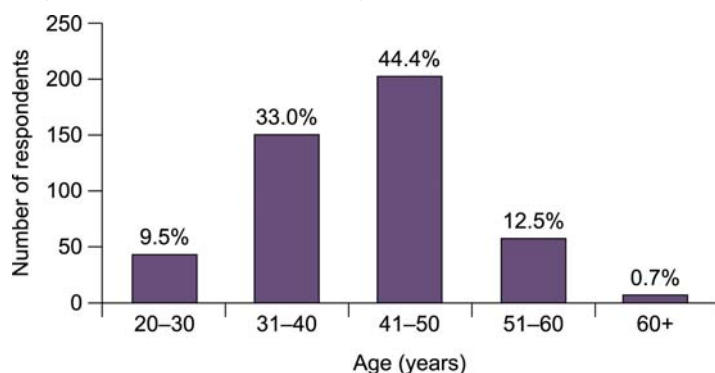


Table 2: Summary of respondent demographics

Parameter	
<i>Nursing experience</i> (years)	
Mean number of years in nursing	18.2
Mean number of years in oncology nursing	11.1
<i>Oncology setting</i> n (%) (multiple options could be selected)	
Caring for patients receiving chemotherapy	339 (74.5)

Hospital inpatient	287 (63.1)
Hospital outpatient	186 (40.9)
Nursing school	41 (9.0)
Home care	21 (4.6)
Hospice	9 (2.0)
Management/administration	5 (1.1)
Other/not applicable	55 (12.1)

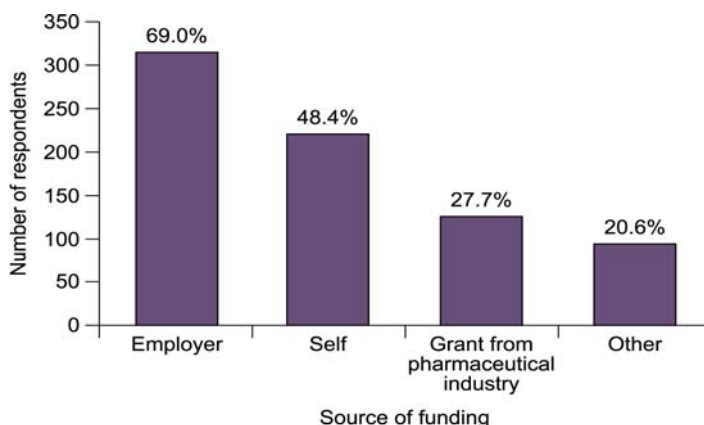
EDUCATIONAL NEEDS – GENERAL

Continuing professional education (CPE)

There is large variability between countries in the perceived requirement for continuing professional education (CPE). Only in the UK was CPE identified as mandatory by all respondents. There, the majority (65.2%) indicated that it was necessary to undertake 1–19 hours of CPE each year to remain registered as a nurse, although 42.9% answered that none of these hours need be in their specialist area of practice. For other countries, 86.3% of respondents indicated that CPE was not mandatory. However, CPE is mandatory in countries other than the UK, including Italy. This inconsistency may reflect changes in CPE regulations during 2003.

Where respondents were undertaking CPE, 48.4% indicated that they had partially or fully funded their own education, whilst 69.0% responded that they received some form of financial support from their employer. Figure 3 summarises the provider of funding for CPE. Again, this funding is highly variable across countries.

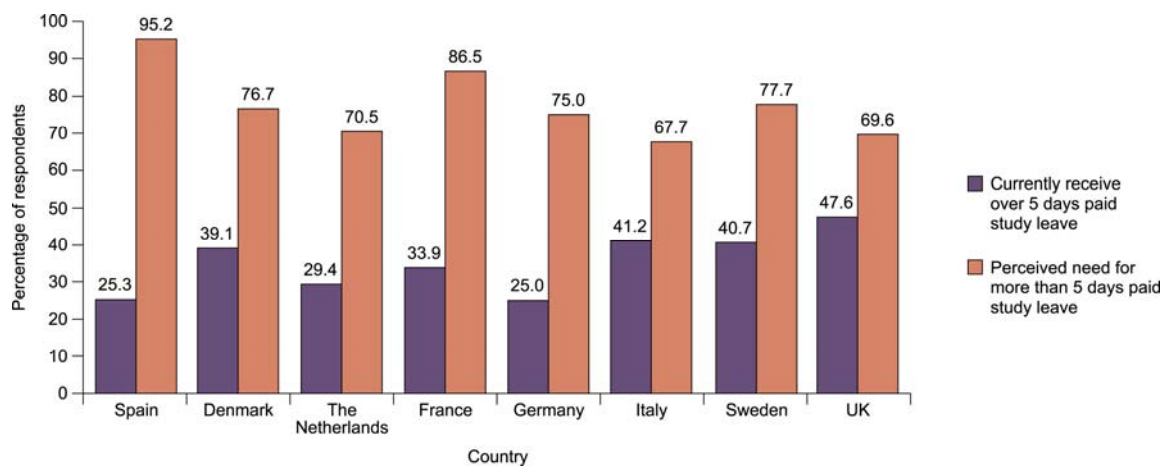
Figure 3: Funding providers for CPE



[More than one source of funding may be available, hence the total percentage exceeds 100%]

Respondents indicated that they receive an average of 5.9 days paid study leave per year, although this varied considerably between countries. While the UK provides an average of 12.3 days per year, 60.2% of Spanish respondents indicated they did not receive any such leave. In fact, 27.9% of all respondents said that they received no paid study leave and only 32.1% received more than five days per year. In contrast, 79.8% felt that they needed more than five days per year, with a similar proportion (74.4%) feeling that up to 14 days would be preferred. Figure 4 compares the proportion of respondents who currently receive more than five days of paid study leave per year, with the proportion who believe that this is necessary.

Figure 4: Paid study leave – proportion of respondents currently receiving, and currently requiring, more than five days per year



Preferred format for CPE

Of those CPE formats about which most respondents commented, and on a scale of 1–5 (1=‘not attractive at all’; 5=‘extremely attractive’), the most popular modes were ‘Attending conferences and workshops’ (4.1) and ‘Undertaking formal courses’ (3.9). ‘Interactive web-based learning’ scored the lowest at 3.2. The latter was only considered to be a very attractive mode of learning by 14.7% of nurses – access to the internet may be a limiting factor in the appeal of such forms of CPE. An additional limiting factor to internet-based CPE, as well as CPE in general, may be a shortage of access to courses in native languages. Questions about the CPE formats of ‘Experience in practical topics’, ‘Learning from colleagues’ and ‘Congresses’ were answered by relatively few people, however, those that did answer rated these highly (a mean of 4.9, 4.8 and 4.3 respectively).

Accreditation of courses appears to be an important factor in course choice, with 65.1% of respondents indicating that accreditation was very, or extremely, important.

These results favour certain formats for the design of future nurse learning resources.

EDUCATIONAL NEEDS – HAEMATOLOGICAL TOXICITIES

Current knowledge

A number of questions posed on the questionnaire were designed to test the detailed knowledge of nurses with respect to cancer-related haematological toxicities. These were either true/false questions, which were generally well answered and showed a good general knowledge of haematological toxicities, or multiple-choice questions, which elicited more variable responses in a number of areas. The responses to these latter questions suggested a short-fall in nurses' in-depth knowledge of the haematological toxicities and their importance. With all questions, the levels of knowledge varied between countries.

Examples of knowledge gaps include the identification of risk factors for neutropenia, where 37.4% of respondents did not answer that the first cycle absolute neutrophil count (ANC) is the strongest predictor of neutropenia. Likewise, only 21.3% correctly answered that neutropenia is defined as an ANC less than $2 \times 10^9/L$. Instead, the majority answered less than $1 \times 10^9/L$, which is the level at which many centres will recognise neutropenia as becoming clinically significant.

Considering anaemia, although the majority of respondents (91.0%) knew that the symptoms associated with anaemia could impact on patients mentally, physically, emotionally and/or financially, only 56.5% of respondents correctly recognised anaemia as the most common haematological complication of patients with cancer. Only 41.1% correctly observed that a low haemoglobin count is not always accompanied by fatigue. This was higher in some countries than others, with only 13.6% of French respondents compared to 95.7% of UK respondents answering this question correctly. This suggests that in some countries, anaemia may not be being diagnosed and treated correctly. Indeed, 9.2% of respondents thought that blood transfusion was the only treatment available for an abnormally low haemoglobin level, and 36.7% felt that physicians and nurses give a low priority to management of anaemia. In the UK, nurses seem to have a very wide knowledge of anaemia-related topics, however, like many other respondents, they feel that there is little consensus in the treatment of anaemia.

Perceived learning needs

Respondents expressed an interest in learning more about neutropenia and anaemia in general (89.0% and 87.7% respectively). This included neutropenia and anaemia patient education (29.9% and 32.6% respectively), as well as aspects of prevention, risk assessment, non-pharmacological management and pharmacological management. It should be noted, however, that the general topics of educational interest varied by country. For example, UK respondents indicated a high interest in 'research' and 'symptom management' (both 30.4%), while French respondents were more interested in learning about 'novel treatments' and 'pain management' (both 25.4%) and psychological needs of patients (32.2%). It has not been possible to link this to the type of respondent (in terms of current job) from each country.

The desire to learn is in direct contrast with the fact that the level of continuing professional education carried out is very low. 69.9% of respondents had not undertaken any formal training in anaemia or neutropenia in the last three years, and only 2.4% had received some form of education on these haematological toxicities during this period.

Perhaps these results point to a lack of suitable CPE courses available. A new nurse education programme dealing with haematological toxicities would be very valuable to oncology nursing. However, the LNA results indicate that any training programme would need to cover a broad range of knowledge levels, and be sensitive to the needs of individual countries.

DISCUSSION

The LNA has revealed that there are clear gaps in nurses' current detailed knowledge of haematological toxicities associated with cancer. This said, nurses do want to improve their knowledge and learn more.

Questionnaires are ideal methods of collecting large amounts of data relatively easily, in particular, they can be easy to perform. However, there are limitations associated with the questionnaire approach in isolation, and some of these are clear with this LNA. For example, with a total of 455 respondents, the number of responses from individual countries was small and therefore it is difficult to generalise the data to different countries. It would be interesting to follow up certain points in larger samples, especially in countries where issues have been raised, or where the sample contained a large number of a certain types or level of nurse. Also, the fact that respondents may not have been questioned or supplied answers in their first language may have contributed to confusion in answering the clinical questions.

The opportunity to complete questionnaires at ECCO 12 facilitated an excellent response. However, the distribution of questionnaires in this manner meant that the sample population was not randomly chosen and therefore most probably, was unrepresentative of European oncology nurses. For example, a large proportion of respondents were from Scandinavia, because Copenhagen was the venue for ECCO 12. ECCO is also a general cancer conference, therefore respondents represented a broad range of job types – however, the majority were oncology nurses or clinical nurse specialists.

The content validity of the questionnaire was established by a group of oncology nurse experts, however, other measures to establish validity were not used, nor was the reliability of the questionnaire established. This means that there is a risk that the questionnaire contains inconsistent, inaccurate or unclear questions and that it does not measure all dimensions of oncology nurses' learning needs around haematological toxicities. Therefore, the findings must be interpreted with some caution and have been analysed in a more descriptive than numerical fashion.

Despite these limitations the LNA findings have provided EONS with guidance for the development of its innovative educational programme on haematological toxicities – TITAN. Rather than being based on the opinions of a small number of expert nurses, TITAN's content is based on the views of over 450 European oncology nurses. Although these views are not representative of all European oncology nurses, they provide a snapshot of the reality. Furthermore, given the differences between countries that became apparent from the LNA data, it would be worthwhile for national oncology societies to follow up country-specific points of interest. Indeed EONS has utilised these data to support country-specific needs in the development of the TITAN programme.

However, given the limitations of the LNA findings, EONS decided to pilot test the TITAN programme in four European countries to ensure that it meets the learning needs of European nurses, and to further identify cultural, language and clinical differences that have been indicated by the questionnaire.

The TITAN programme

The TITAN programme, currently nearing the end of the pilot stage of development is modelled after the well-established US programme, ATAQ. Focus is placed on those areas highlighted in the LNA that can impact positively on the prevention, detection, and management of haematological toxicities. This includes patient education, risk assessment and patient management. Table 1 highlights one of the main differences between the ATAQ and TITAN programmes – TITAN divides the identification of risk factors and discussion of clinical practice into individual toxicity-related presentations, while ATAQ discusses them together. This has allowed TITAN more focus on each area, and the delivery of specific topics by experts in that area. Crucially this has also resulted in a strong expert-led development of the programme.

Both ATAQ and TITAN emphasise the importance of patient education by dedicating a whole presentation to this topic. Although not discussed in the table, TITAN has continued with ATAQ's continuous education theme by also introducing a follow-up dissemination project. Therefore the programme includes a presentation focussed on how to approach a dissemination project, including selection of an appropriate audience and development of objectives.

A TITAN Working Group was established with responsibility for the development of course content, and in March 2004, the first pilot TITAN course was run in Ireland, with the help of the Irish Association for Nurses in Oncology (IANO). The official launch of TITAN took place at the EONS 4th Spring Convention in April 2004. Subsequent pilots were held in France (in conjunction with AFIC – Association Française des Infirmier(e)s de Cancérologie) and in The Netherlands (in conjunction with VVOV – Vereniging van Oncologie Verpleegkundigen). The current pilot format comprises pre-course reading material, seven hours of learning contact time and a follow-up dissemination project – all of which combine to address unmet educational learning needs in a structure that satisfies the preferred modes of learning recognised in the LNA. Whilst ATAQ has now developed a strong web focus, the LNA indicated that, certainly for now, European nurses would prefer a more face-to-face learning structure. This may indicate a difference in nurse perceptions of internet-based learning, and differences in access to IT compared with US nurses. It may also indicate the evolution of ATAQ into a successful programme, which is now accessible to many more participants than could attend numerous workshops.

The TITAN programme also uses a series of pre-/post-session and course questionnaires which support the learning of the nurses throughout the programme. This type of approach is advocated in evaluating the effectiveness of courses and will be used in TITAN's further development (Hicks and Hennessy, 2001).

TITAN has been developed with two target audiences in mind. Firstly, nurses who are relatively new to oncology, who will use TITAN as a learning tool, and secondly, more experienced nurses who wish to take a more active role in patient or nurse management and education. Further information about TITAN will be available from the EONS website (www.cancerworld.org) once the pilot stage is complete and has been evaluated.

CONCLUSIONS

This paper provides only a summary of the data from the learning needs assessment of European nurses carried out during 2003. Although the data is subject to limitations, the LNA has provided a valuable insight into the education and learning needs of European oncology nurses in relation to haematological toxicities.

Overall, the data suggested a good baseline understanding of haematological toxicities, although more detailed knowledge appears to differ by country, with knowledge gaps evident in some areas and some countries. However, in general, nurse respondents are keen to improve their knowledge and would welcome more responsibility, certainly for the education of patients.

Nurses want to undertake more CPE than presently funded and would favour courses that are accredited. Further investigation of the data has suggested that those nurses undertaking more CPE make a greater contribution in the management of patients with haematological toxicities. Therefore, CPE in this area can contribute to improved patient care and quality of life for patients with cancer.

The results of this LNA are important to EONS and the wider cancer nursing community. Combined with the evaluation of the TITAN initiative, they will provide a clearer understanding of the learning needs for European nursing audiences, with the potential to improve care for patients with cancer.

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