Dyscalculia: awareness and student support

Educators need to become conversant with dyscalculia and consider strategies for supporting student nurses through to registration

In this article...

- An explanation of the learning need called dyscalculia
- A discussion of the difficulties faced by dyscalculic students
- How to assist dyscalculic students with their training and ongoing practice

While most people are familiar with dyslexia, dyscalculia is less well known. Simply defined as a lack of understanding or comprehension of maths (Chinn, 2006), it belongs to the family of specific learning needs and was first identified around 1934 (Kosc, 1934). Compared with dyslexia, which was defined over 100 years ago (Smythe, 2001), dyscalculia is a relatively new concept. This means that evidence to support pre-registration student nurses who have dyscalculia remains sparse.

The National Numeracy Strategy extends the definition of dyscalculia to include difficulties with the concept of numbers, or with the rote mechanism of learning maths, such as number rules and facts (Department for Education and Skills, 2001). While the strategy focuses on primary school children, this may be relevant for adult learners too.

Given that dyscalculia was recognised only recently, most adult learners with dyscalculia will have experienced primary education without diagnosis or adjustment. This means they may struggle to bridge the gap in knowledge.

While dyslexia and dyscalculia are considered different learning needs, there is evidence to suggest that they can coexist in individuals, with one being more dominant than the other (MacDougall, 2009).

In addition to problems with understanding mathematical tasks, people with dyscalculia can also have difficulties with spatial processing, hindering their ability to “guestimate” the size of a number (Musolino et al, 2011). Some may have general numerical difficulties whereby they substitute one number for another. They may even do this when using a calculator; in this case, the answer to a calculation may be 5, but the individual may write 7.

The fact that there are often several terminologies for a single mathematical task can be an additional source of confusion for those with dyscalculia. For example, terms used in discussing addition include more than, add, plus, sum of and total.

For students on pre-registration nursing programmes, the use of medical terminology can compound these pre-existing difficulties.

The prevalence of dyscalculia is largely unknown. Butterworth (2003) suggested that 5-6% of the population have a diagnosis of dyscalculia; however, Desoete et al...
As stated above, many adult learners have been through primary education without this assessment, and many students may go through assessments before their dyscalculia is diagnosed. In this instance, they may either be unsuccessful at academic assessment or need further attempts once they have been assessed and reasonable adjustments are in place.

Another challenge faced by students with dyscalculia is that healthcare focuses on evidence-based practice, which requires them to be able to critically appraise the evidence. It could be argued that these students may have difficulty in critical evaluation when primary research reports often include a variety of complex mathematical calculations. Table 1 shows some examples of the difficulties faced by nurses, pre-registration students, and those wanting to enter programmes.

On qualification, nurses with dyscalculia should be reassessed to see whether any reasonable adjustments continue to be sufficient to enable them to practise safely and meet professional and public expectations of nurses.

To qualify as nurses, all students must complete all outcomes of a pre-registration nursing programme, which include the requirement to reach a baseline level of numeracy, and to achieve academic assessments throughout their period of study. While the NMC (2010) has incorporated numeracy throughout all five of the essential skills clusters (ESC) required of nurses, students must achieve a 100% pass mark in, among others skills, numeracy at the point of entry to the register. The guidance to support the ESCs focuses on the application of numeracy to patient care, including the ability to assess which calculations are required, application of the right mathematical concepts and evaluation.

It is the responsibility of the programme provider, however, to decide how this is taught and assessed. For those with dyscalculia, it would be beneficial to avoid being over-reliant on traditional teaching and learning strategies for numeracy and encourage a blended learning approach with multiple teaching strategies.

Expectations and balancing disparity
Dyscalculia can present a complex situation with many conflicting requirements and considerations (Fig 1). The NMC (2010) standards for pre-registration education and Equality Act (Home Office, 2010) make it clear that students with a disability should be included and supported through reasonable adjustments. These are
alterations and support that can enable individuals to access education as if they did not have a disability. The adjustments must, however, be reasonable to all: the student, the profession, the employer and in the case of nurses, the patient. There is often concern that those with dyscalculia may be more likely to make errors that compromise patient safety, but it could be argued that this situation can be avoided through appropriate and timely reasonable adjustments.

The public and professional expectations of nurses may also conflict with the perceptions of student nurses with dyscalculia; at the same time, students may have conflicting expectations of themselves and of the adjustments that can be offered. In addition, White (2007) and Richardson and Wydell (2003) suggest that those with a learning need may experience higher levels of anxiety and stress, which can inhibit and obstruct their ability to progress. While these authors focus upon dyslexia, it is reasonable to assume that those with dyscalculia may suffer similar emotional responses.

Reasonable adjustments
Pre-registration student nurses with dyscalculia need timely and appropriate assessment. It is essential that they receive an early educational psychology assessment and that appropriate reasonable adjustments are made. This should be followed by the impact of their dyscalculia. On clinical practice, students who substitute numbers visually. Another assistance may be online, or computerised, software packages for drug calculations. In practice, the level of supervision for pre-registration students is such that all calculations and number work can be cross-checked by qualified staff. This may encourage students to develop their reasonable adjustments and become increasingly independently as they near registration. However, on registration, the expectations of the nurse change and it would be essential for the employer to reassess and provide appropriate reasonable adjustments, specific to the practice area. It would be the responsibility of the registered nurse, under the code of conduct (NMC, 2008) to disclose the learning need if there were implications for the safety of patients.

Conclusion
Dyscalculia, although a relatively newly recognised learning need, has significant implications for pre-registration nurse education. It is reasonable to assume that, with the development of assessment strategies and expertise in dyscalculia, the incidence of diagnoses will rise over the coming years. It is essential, therefore, that educators are aware of this learning need and consider strategies for supporting students with it. Students require early assessment and reasonable adjustments to comply with both the Equality Act 2010 and the Standards for Education (NMC, 2010). However, it remains contentious within nursing as to whether reasonable adjustments may be enough to balance the conflicting requirements of legislation, and duty of the profession to safeguard the public. Clearly, more evidence and research are required to address this deficit in nurse education today.

References