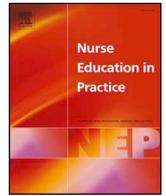




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## Doctorate Studies

## Perceptions of the possible impact of dyslexia on nursing and midwifery students and of the coping strategies they develop and/or use to help them cope in clinical practice

Anna T. Crouch (Dr)<sup>1</sup>*The University of Northampton, Faculty of Health and Society, Waterside Campus, University Drive, Northampton, NN1 5PH, United Kingdom*

## ARTICLE INFO

## Keywords:

Dyslexia  
Practice  
Coping strategies  
Nursing

## ABSTRACT

This qualitative grounded theory case study aimed to explore the perceptions of the impact of dyslexia on nursing and midwifery students and of the coping strategies they develop and/or use to help them cope in practice. The questions addressed were:

1. What is the perceived impact of dyslexia on the nursing and midwifery student in clinical practice?
2. How are any difficulties associated with dyslexia managed by the nursing or midwifery student?
- 3i. What strategies can help and support nursing and midwifery students with dyslexia?
- 3ii. What are students' and mentors' perceptions of the poster guidelines used by mentors to support nursing and midwifery students with dyslexia in the clinical practice?

Having obtained ethical approval for the research and participants informed written consent, a purposive sample of 12 nursing and midwifery students and 22 mentors participated in the study. Data were collected by digitally recorded semi-structured interviews, content analysis of students' practice portfolios and files from students. Evaluative comments from mentors were also collected. Data were analysed using Glasarian grounded theory method.

Dyslexia impacted on the students practice negatively and positively. They developed and used simple and other strategies, including those on the poster guidelines, which were evaluated positively.

## 1. Introduction

The main aim of the Disabilities Discrimination Act (DDA, 1995–now superseded by the Equality Act, 2010) is to promote equality. This is in line with legislation of other countries, including the American with Disabilities Acts (ADA, 1990) and the Australian Disability Discrimination Act (DDA, 1992a,b). This, coupled with the widening participation movements in the UK, seem to have led to a steady increase in the number of students who enrol on to higher education courses (Department for Education, 2018). Employment rate for the disabled also increased from 44.5% in 2002 to 51.3% in 2018, albeit the gap between the rate of employment for the disabled and the non-disabled is growing (Powell, 2018). Nonetheless, interests in supporting students with disabilities in accessing and for those attending higher education courses or in employment has been shown internationally, in response to legislation.

## 2. Background and rationale

Despite statistical evidence of an increase in the percentage of disabled students in higher education, an equality impact assessment suggested that 'disabled people are less likely to' attend higher education institutions' (NMC, 2008,p.11). Albeit, 'when they do, they are more likely to' undertake 'vocational courses' (NMC, 2008,p.11), with nursing as the most popular choice for those with dyslexia (Wray et al.,2013). Moreover, more than half of those who enrol on to courses in higher education with a declared disability have dyslexia (National Audit Office, 2007) so has implications for educators and employers.

Evidence suggest that transition from compulsory education into higher education is stressful (McGuckin et al., 2014). Yet, the modernisation of nursing and midwifery roles led to a shift from diploma to all graduate level courses (DOH, 2002; NMC, 2009, 2010; 2018). This has implications for dyslexic nursing and midwifery students.

E-mail address: [anna.crouch@northampton.ac.uk](mailto:anna.crouch@northampton.ac.uk).

<sup>1</sup> Present address: 3 pine Court Spalding. Lincolnshire. PE12 6FG United Kingdom.

Dyslexia is classified under the ‘specific reading disorder’ section by the World Health Organization (WHO, 2015). Also termed ‘neurodiversity’, its prevalence is about 10% in the UK (BDA, 2017) and 10–15% in the USA (Dyslexia Research Institute, 2016). Vellutino and Fletcher (2007) found that symptoms such as poor phonological awareness and lexical deficits in terms of word identification and spelling in children during their early years of learning to read, remained observable in the same persons right into adulthood. Ingesson (2007) also described the term ‘dyslexia’, as a long-term condition with associated long-term difficulties.

Apart from reading, for instance, evidence suggest that dyslexic students have problems with writing in academic (Crouch, 2010) and in clinical settings (Price and Gale, 2006; White, 2007; Crouch, 2008). Slow processing speed has also been associated with dyslexia (Nicholson et al., 2010). This has meant taking more time to write or to perform other tasks for some as noted by USA researcher (Kolanko, 2003) and others from UK (Child and Langford, 2011).

Other listed observable behaviours in individuals with dyslexia included forgetfulness, poor numeracy, spoken language and organising skills, low self-esteem and the lack of confidence (McLoughlin and Leather, 2013). Some dyslexic individuals also have dyscalculia (Crouch, 2008). This has implications for practice, as nursing and midwifery students are expected to be fit for practice.

Being fit for practice means ‘the ability to practice safely and effectively without supervision’ (NMC, 2010a,b,p.147). This means “having the skills, knowledge, good health and good character to do one’s job safely, effectively” and competently, on registration as a nurse or a midwife (NMC, 2010b,p.5), with or without disability and/or reasonable adjustments. Demonstration of the required knowledge and skills is dependent on literacy and numeracy skills (NMC, 2010a).

The provision of reasonable adjustments to help meet needs of disabled students, although mandatory (Equality Act, 2010), is costly and is dependent on the disclosure by individuals. However, evidence suggest that healthcare students and staff with disabilities, tend not to disclose for fear of being treated differently, stigmatised, or regarded as stupid (Crouch, 2008; Ridley, 2011; Hargreaves et al., 2014).

According to Tee et al. (2010) known reasonable adjustments in the academic settings are not necessarily transferred into practice. There is also very little written in terms of the appropriateness of such adjustments (Howlin et al., 2014). Dearnley et al. (2010) evaluated a mobile device for learning and assessment of disabled students and staff. Howlin et al. (2014, p.565) also evaluated ‘a clinical needs assessment’ and explored ‘associated support for disabled students’. However, both studies related to accommodations only.

It is evident from UK (Crouch, 2008; Ridley, 2011; Locke et al., 2016), and Australian (Ryan and Brown, 2005) studies, that, dyslexic students develop strategies to assist them with literacy and practice skills. There was however a lack of evidence on the perceptions of dyslexic students of such strategies, in relation to their effectiveness. Moreover, there is little in terms of workbooks or guidance for mentors supporting individuals with dyslexia in the practice areas (Dearnley et al., 2010). The RCN tool Kit (Cowan, 2010), although informative, it is lengthy and generic for those with dyslexia, dyscalculia, and dyspraxia. Crouch (2009), also developed poster guidelines to help mentors supporting students with dyslexia in practice and this has been in use by some mentors so needed to be evaluated formally to allow adjustments to be made. This, coupled with the very limited research papers on the chosen topic, led to the need for, and conduct of this study, based on the following set aims and questions below;

### 3. Aim/s of study

The study aimed to explore the perceived impact of dyslexia on nursing and midwifery students and on the coping strategies they used to help them cope with issues related to dyslexia in clinical practice. The students and mentors’ evaluation of the usefulness of the tool kit (poster guidelines used for supporting nursing/midwifery students with dyslexia in clinical practice) was also carried out to allow for

adjustment to be made where necessary.

### 4. Questions addressed

1. What is the perceived impact of dyslexia on the nursing and midwifery student in clinical practice?
2. How are any difficulties associated with dyslexia managed by the nursing or midwifery student?
- 3i What strategies can help and support dyslexic nursing and midwifery students?
- 3ii What are the students’ and mentors’ perceptions of the poster guidelines used by mentors to support nursing and midwifery students with dyslexia in the clinical practice?

### 5. Research methodology/methods

Having looked at various viewpoints from different authors, a combination of factors shaped the choice and use of research methodology and methods. A qualitative study underpinned by constructivist, interpretive, ontological ‘view that reality is constructed rather than set in stone’ was carried out (Broom and Willis, 2007, p.25) using a case study approach (Glaser and Strauss, 1999; Yin, 2009). This allowed for an in-depth study, analysis of individual cases and rich accounts of lived experiences (Rose and Shevlin, 2016).

Research on coping strategies developed by students and on the perceptions of their effectiveness was almost non-existent at the time of this study. The Glasarian grounded theory (Glaser and Strauss, 1999) was thus used to collect and analyse the data to give new perspectives on the chosen topic. This meant a pragmatic approach was adopted to some extent because it seemed fit for the purpose of the research (Denzin and Lincoln, 2013).

#### 5.1. Research sample/sampling method

Having sought and gained ethical approval from appropriate research committees, and informed verbal and written consent from participants, 17 dyslexic students consented to take part in the study but five of them did not turn up. The participants of this study needed to have the ‘particular characteristics’ and first-hand knowledge ‘being sought to help build appropriate sample’ (Cohen et al., 2011, p.156), and data that ‘could be conceptualized and help formulate a theory’ (Glaser and Strauss, 1999, p.46). A purposive sample of 12 from three different sites (all formally diagnosed with dyslexia), was therefore used to help address all the set questions. Five of them were midwifery students, three were from adult, three from learning disability, and one from mental health nursing fields. Inclusion criteria also meant each participant had been on the course for at least six months and had formally disclosed of their disability. A purposive sample of 22 mentors, who at the time of this study, were mentoring or had mentored students with dyslexia within the past three years to help address question 3ii, was also used.

#### 5.2. Recruitment and data collection methods

Recruitment of students involved one going into classrooms and giving both verbal and written information on the proposed research to all students. They were advised not to disclose their interest in class if they met the inclusion criteria and wished to participate; but to contact the researcher via email or to return their completed consent form by post discreetly to maintain confidentiality. Once a student made contact, a meeting date and venue was agreed although individuals could opt out anytime without explanation. Face to face, one to one, digitally recorded semi-structured interviews were then conducted with the students to address all the questions. A guided conversation using the funnelling questioning approach in a friendly unbiased and non-threatening way was adopted to reduce respondent biases whilst enhancing the trustworthiness of the research (Robson, 2004). A

questionnaire, using open ended questions was also placed on the university virtual learning platform (UVPL) to collect data from the mentors to help address question 3ii. Data was also collected from relevant aspects of the students' files (N = 12) and from their practice portfolios (N = 8), the latter of which were written by 27 different mentors who had worked with and observed the students in practice.

### 5.3. Data analysis

Transcribed data from the taped interviews were analysed using the constant comparative method (Glaser and Strauss, 1999) during when themes were generated through substantive, selective and theoretical coding (Stern and Porr, 2011). Content analysis of relevant aspects of students' files and practice portfolios was carried out. Evidence from that data and the qualitative comments from the mentors to help answer research questions 3ii were then compared with the transcribed data collected from the students, using the constant comparative method. This allowed theme generation and theory building. Data triangulation provided 'multiple measures of the same phenomena' to help enhance construct and internal validity, hence the overall trustworthiness of the research (Yin, 2009, p.116). Codes generated with letters and numbers were used instead of participants names to protect their privacy (NMC, 2015a) in the transcripts and thesis, examples of which are given below:

- N2.8 = dyslexic student nurse 2, answer 8,
- M4.4 = dyslexic student midwife 4, answer 4
- N4.P3 = student nurse 4 Portfolio data 3,
- M1.P1 = student midwife 1 Portfolio data 1,
- Ment1 = Mentor 1 (Crouch, 2017, p.69)

### 6. Findings

Several themes were generated and grouped into three core

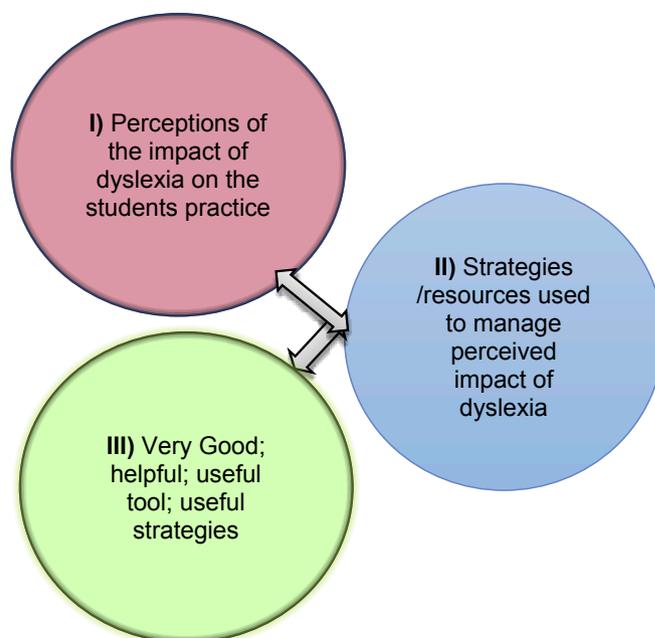


Fig. 1. Core categories to which themes were assigned (Crouch, 2017, p72).

categories (Glaser and Strauss, 1999), each with their sub-categories and properties. The core categories namely, I) 'Perceptions of the impact of dyslexia on the student' II) 'Strategies/resources used to manage perceived impact of dyslexia'; and III) 'Very good, helpful, useful tool; useful strategies' are shown diagrammatically in Fig. 1.

**Table 1**  
Perceptions of the impact of dyslexia on the student's practice (Fig. 1,I).

Themes	Example of quotations
<ul style="list-style-type: none"> <li>• Documenting is challenging</li> <li>Mix up words/numbers, spelling; grammar</li> <li>• Difficulty with reading</li> </ul>	<ul style="list-style-type: none"> <li>• 'For me the writing is the hardest bit' (M2.59)</li> <li>• ' ... It was a challenge' (N1.18)</li> <li>• 'If you said read this little paragraph on management of the PPH, I would feel myself just glaze over' (M3.29)</li> <li>• 'White paper with black squares is not the easiest ... I took in a blue plastic overlay ... to help keep in place all the lines' (N1.21)</li> </ul>
<ul style="list-style-type: none"> <li>• Slow at tasks</li> <li>• Poor short-term memory</li> <li>• Stressful/frustrating</li> </ul>	<ul style="list-style-type: none"> <li>• 'Learning new techniques is something that perhaps takes me a little bit longer than other people ... (N7.53)</li> <li>• 'Because my memory is quite poor ... two weeks after an incident I won't be able to remember ... (M5.72)</li> <li>• 'Every single placement that I start is quite stressful because they all do it differently' (N3.35)</li> <li>• 'Feeling needed in every direction rather than ... frustrated is the wrong word' (M4.76)</li> <li>• 'The more stressed I get the more forgetful I get ... then all the dyslexic problems go into one'<sup>2</sup> (N4.140)</li> </ul>
<ul style="list-style-type: none"> <li>• Multi-tasking is challenging</li> </ul>	<ul style="list-style-type: none"> <li>• 'It was very difficult for me to actually physically listen, watch their body language and understand what it was they were saying and make notes at the same time' (N2.16)</li> </ul>
<ul style="list-style-type: none"> <li>• Difficulty with numeracy</li> <li>• Drug administration is challenging</li> <li>• Poor organising skills</li> <li>• Labour care provision is challenging<sup>2</sup> (student midwives only)</li> <li>• Disclosure</li> </ul>	<ul style="list-style-type: none"> <li>• 'Difficulty with numeracy- yes that ticks one of my boxes!' (N1.71).</li> <li>• 'Say if it was 21 mg I might say 12 mg ... I might say it wrong, but I don't see it wrong ... ' (N4.106)</li> <li>• 'I know what it needs but I don't necessarily know how to organise it' (N4.65)</li> <li>• 'Pictures is better ... I wouldn't be able to say on a vaginal examination, sutures there, that one's there' (M5.68)</li> <li>• 'It's quick labour, you deliver, and you haven't written a thing, you go back and then it's trying to remember it in logical order' (M4.37)</li> <li>• 'I feel that would be justification on their part to consider me incapable ... ' (M3-typed note)</li> <li>• 'I don't disclose to placement that I am dyslexic' (N3.103)</li> </ul>
<ul style="list-style-type: none"> <li>• Confidence</li> </ul>	<ul style="list-style-type: none"> <li>• 'Yeah, ...I have a massive lack of confidence in myself ... (M3.59)</li> <li>• 'Was confident and enthusiastic' (N3.P4)</li> </ul>
<ul style="list-style-type: none"> <li>• Safety issues</li> </ul>	<ul style="list-style-type: none"> <li>• 'I write in milligrams when it really is in millilitres. Even though I have given the patient the right dose it might look like I have given them the completely wrong dose (N6.93)</li> </ul>
<ul style="list-style-type: none"> <li>• Practice is a strength</li> </ul>	<ul style="list-style-type: none"> <li>• 'My strongest point is practice ... getting A's and B's' (N1.28)</li> <li>• 'She is a very organised person ... ' (N3.P7)</li> <li>• 'Implemented ... changes to medication charts' (N4.P3)</li> <li>• 'Dyslexia has allowed me to be quite creative, see things outside the box.' (N5.62)</li> <li>• 'Exceptional student (M3.P3)</li> <li>• 'Is very caring'(M4.P3)<sup>2</sup>; ... told I am observant' (M5.34)</li> <li>• 'Has good communications skills ... ' 'is reliable' (N6.P)<sup>2</sup></li> </ul>

**Table 2**  
Strategies/resources used to manage perceived impact of dyslexia (Fig. 1,II).

Themes	Examples of comments
<ul style="list-style-type: none"> <li>● Safety conscious: (Vigilant; check or double check; repeat)</li> <li>● To do list<sup>2</sup></li> <li>● Write it down/audio notes: (dyslexic short-hand; symbols; Mnemonics; prompt cards)</li> <li>● Different coloured pens</li> </ul>	<ul style="list-style-type: none"> <li>● 'I am quite OCD with my notes ... I check, and I check them three or four times before I will happily sign it ... ' (M2.66-67)</li> <li>● 'I like my list! ... quite a good strategy for me' (M2.75)</li> <li>● 'A ready reckoner ... with just a pen and paper' (N7.99)</li> <li>● 'Mnemonics has helped me quite a lot' (M5.84)</li> <li>● 'I find it useful with different colours to write next to, I do tick boxes.' (N6.14)</li> <li>● 'Uni ball pens are brilliant' (N3.119)</li> <li>● 'So oral in a different colour. Then the dose in a different colour ... '<sup>2</sup> (M5.122)</li> <li>● 'Quite a lot of the stickers help a lot! ... postnatal stickers' (M1.51)</li> <li>● 'If it's tick box things I find that easier (M5.18)</li> <li>● 'I tended to remember better if I associated what I needed to do with a physical action ... e.g. ....if I touched my finger or crossed my fingers ... ' (N2.33)</li> <li>● 'I ... struggled to keep the words in place, whereas blue and green overlays made it stay still ... they are really good' (N1.41)</li> <li>● 'There are ... so many different doses and I can very easily get one of those wrong and if I do that is majorly detrimental, ...I avoid it at all costs' (M5.117)</li> <li>● 'I have had amazing mentors' (N1.114)</li> </ul>
<ul style="list-style-type: none"> <li>● Reduced amount of writing: (Stickers; tick lists; birth summaries; drop down menus; Dictaphone; Dragon dictate; already prepared handover sheets)</li> <li>● Other strategies: Neuro-Linguistic Programming Anchoring (NLPA)<sup>2</sup></li> <li>● Coloured overlays</li> <li>● Avoidance</li> <li>● Helpful mentor</li> </ul>	

**Table 3a**  
The strategies and resources found to be useful. 'Very good helpful/useful tool/strategies' (Fig. 1,III).

<ul style="list-style-type: none"> <li>● Memory joggers and organising strategies</li> <li>● Strategies that help with documentation</li> <li>● Other coping strategies and/or resources</li> <li>● Poster/Poster guidelines (Crouch, 2009)</li> </ul>	<ul style="list-style-type: none"> <li>● To do list</li> <li>● University coloured pens</li> <li>● Write it down</li> <li>● NLPA</li> <li>● Stickers</li> <li>● Dropdown menu</li> <li>● Birth summaries (midwives only)</li> <li>● Tick list</li> <li>● Repetition</li> <li>● Double checking</li> <li>● Time taken or given</li> <li>● Use of coloured overlay (blue, green yellow or beige)</li> <li>● Supportive mentor and staff (Table 3b)</li> </ul>
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**Table 3b**  
The strategies and resources found to be useful. Examples of evaluative comments on poster guidelines.

<ul style="list-style-type: none"> <li>● Poster -Useful tool kit</li> <li>● Poster guidelines - Informative teaching and learning guide - Raises awareness of what dyslexia is about/strategies used</li> </ul>	<ul style="list-style-type: none"> <li>● 'A very useful tool for clinical placement environments' (Ment3)</li> <li>● 'This poster was very helpful, clear and able to get across ways to support individuals' (Ment5)</li> <li>● 'This is perfect' (N3.102)</li> <li>● 'Informative ... helped me to prepare how I view my teaching methods'(ment7)</li> <li>● 'I think they are brilliant (N3.117; M2.110)</li> <li>● 'Gives mentors some useful guidelines for supporting students with dyslexia' (Ment6)</li> <li>● 'I think this is quite useful. It's got the problems which for a dyslexic person although they know it, they don't always remember what their problems are (N4.137)</li> </ul>
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6.1. Core category I

Themes generated suggest that dyslexia impacted on the students negatively and positively and are listed under core category I (Table 1).

<sup>2</sup> Adds to body of knowledge.

The students greatest concern related to challenges encountered when writing. New or busy environment and multi-tasking generated stress for some students with a cascading effect. Nonetheless, they enjoyed practice within non-stressful environment and described practice as their strongest point. They had very good interpersonal skills and some were creative, very caring and conscientious<sup>2</sup>, well organised and observant with problem solving skills<sup>2</sup>. Mentors comments validated this.

6.2. Core category II

They were also safety conscious, hence, hypervigilant. Additionally, they developed and used simple but effective strategies and other available resources to help them cope in non-stressful environment. This generated the second core category, namely, 'strategies/resources used to manage perceived impact of dyslexia' (Table 2).

6.3. Core category III

Most of the strategies they developed and/or used, including those on the said poster were described as 'very good, helpful or useful', forming core category III. Those strategies and resources are listed in Table 3a. Although the poster was positively evaluated (Table 3b), some recommendations including the need to make any future toolkit interactive were made by mentors and students.

7. Discussion

Although dyslexia is currently identified as a long-term 'specific reading disorder'. (WHO, 2015), the greatest concerns of the students related to challenges faced with writing. Participants in other UK (Price and Gale, 2006; Crouch, 2008, 2010; Murphy, 2011; Sanderson-Mann et al.,2012; Newlands et al., 2015) and USA (Kolanko, 2003) studies from nursing, medical and radiography fields also reported difficulties in reading and writing. Although common in other fields (Burns and Bell, 2010; Shaw and Anderson, 2018), difficulties with writing is overlooked as many definitions of dyslexia do not refer to such. Many factors contributed to issues with reading and some used different coloured background for reading, albeit controversial.

Apart from reading and writing, having short term memory meant many were forgetful, a finding supported by those of others (Kolanko, 2003; White, 2007; Crouch, 2008; Ridley, 2011), albeit small samples were used. The literacy issues coupled with word and number

switching, forgetfulness and lack of experience contributed to reported errors in documentation and in drug administration although the latter was unrelated to calculation errors.

Having slow processing speed also contributed to students being slow at performing new tasks; a finding consistent with other UK studies in nursing, midwifery (White, 2007; Crouch, 2008; Sanderson-Mann et al., 2012) and radiography fields (Murphy, 2011). However, none of them were observational studies.

Exposure to multi-tasking such as listening and writing whilst on the telephone, and or observing at the same time during history taking also proved challenging for some. Therefore, a maladaptive strategy such as avoidance in answering the telephone phone was adopted and could have been detrimental to patients. This corresponds with findings by other researchers (Crouch, 2008; Newlands et al., 2015; Ryan and Brown, 2005). This coupled with working on busy environments, generated stress with cascading effects such as tiredness, 'light headedness', 'confusion', 'poor concentration', 'making more mistakes', 'more forgetful', 'anxiety', 'mixed up words and/or stuttered'. Such findings amongst others add to the body of knowledge. All the challenges encountered meant, some lacked confidence, a finding supported by those of others (Price and Gale, 2006). Nonetheless, they had excellent mentor and staff support albeit disclosure remained an issue.

Despite their heightened self-awareness and hypervigilance, safety issues were raised. Some for example, used colour codes to identify drug names, types, route and doses<sup>2</sup>. Although controversial, it highlights the importance of colour for some dyslexic individuals. Moreover, none of the mentors' comments from the portfolios were suggestive of errors. Contrarily, they described the students as 'reliable', 'exceptional', 'creative', 'caring', 'well organised' and 'confident', some of which validated the students' perceptions of themselves. They were also very conscientious, had good interpersonal and observational skills, all of which are essential skills in healthcare fields.

Simple cost-effective coping strategies were developed and used, apart from accommodations and readily available resources most of which were described as very good, helpful and or useful. Table 4 shows coping strategies used in this study compared with those from other UK, Sweden, USA and Australian studies. Notably, the use of to do list, tick boxes, drop down menu, stickers, colour codes to identify drug types, route and doses, NLP techniques, which helped individuals cope add to the body of knowledge (Table 4; Crouch, 2017). This is because none of the studies identified them as coping strategies although they are not new concepts.

Although positively evaluated, the poster/guidelines were to help mentors who support dyslexic students. Many recommendations including the need for a tool that could be used interactively were made by students and mentors and were considered in developing a new tool kit, to be placed in students' portfolio on line. All the above findings have implications for practice.

### 7.1. Implications for practice

Being able to read, and to write clearly and accurately in patients' notes, assessment forms and/or care plans is necessary to safeguard the interest of patients (NMC, 2015b). Safe and competent drugs administration and management of patients through holistic assessment, care planning, provision and evaluation are also vital in safeguarding and promoting their interests. The need for early identification, risk assessment and appropriate support provision cannot be over emphasised. An honest, open and trusting environment should therefore be fostered to encourage disclosure. Good liaison between staff and the students should also be maintained.

It is evident that dyslexic individuals who received appropriate and tailored support had good progression rate that were comparable to that of non-dyslexics (Wray et al., 2012). An individualised approach to support provision and the continuous monitoring of students with or without dyslexia progress is also vital. Preceptorship programme to support new registrants in employment up to a year should remain mandatory.

Notably not all the students reported errors, and each person has desirable qualities and strengths that should be tapped into for effective management of patients. Any support that might enable disabled students in any way should also be considered (Walker et al., 2013; St John-Matthew et al., 2016). Adaptive strategies could enhance learning and minimise or avoid errors in clinical practice, hence enhance patients' safety, which is one of the main aims of healthcare (NMC, 2015a,b). Their use have been linked to success (Raskind et al., 2002), hence should be encouraged (Crouch, 2016; 2017). Raising awareness of the possible impact of dyslexia on practice, and on coping strategies and/or available resources that have been identified as useful or helpful is vital. The use of the newly developed support framework and toolkit for supporting dyslexic students (Crouch, 2017; Appendix 1) is recommended and should be considered as best practice tool by the NMC and policy makers. This will require future formal evaluation. Nonetheless, all requests for adjustments should be considered but any adjustment considered and agreed as reasonable might become unreasonable if needed in excess (Cowen, 2010). Where the provision of appropriate support fails to remedy difficulties, fitness to practise procedures should be followed.

## 8. Conclusion

Dyslexia seem to impact on individual practice negatively as well as positively. The need to provide reasonable adjustment for dyslexic individuals seems to be good practice, although it is costly (Dearnley et al., 2010). There is also limited evidence of their effectiveness in the clinical settings. Arguably, many of the strategies developed and/or used by the students in this study to help them cope are simple and cost-effective and are linked to achieving success (Raskind et al., 2002). Therefore, dyslexic and other disabled individuals should be encouraged to develop and use effective, albeit, simple coping strategies. This means individuals will participate in their management in line with the WHO report (2011), which will help promote their independence. This does not exempt organisations and employers from their role in providing accommodations to those with dyslexia but should be complementary to and essential for achieving success in the provision of healthcare.

Methods used are transferable, but the sample is small making generalisation difficult. However, steps were taken to enhance research trustworthiness. Further research is required.

## Funding

This work was supported in part by the University of Northampton. My PhD was undertaken at my previous work place, the University of Northampton, where I sought and gained permission from appropriate research ethics committees to carry out the research, based on my chosen study design. This involved permission to recruit participants, collect data and the provision of Nvivo 10 which I used in part to analyse the data, under the supervision of my supervisors and director of studies.

Permission was granted to submit this article by my director of studies and the Dean of the Faculty of Health and Society (previous place of employment) at the above-named institution.

**Table 4**  
Coping strategies developed and/or used: overview of findings from this study compared with studies that showed use of similar coping strategies (UK, Sweden, USA and Australia).

Findings	Other Healthcare fields studies on dyslexia															
	Illingworth (2005) UK	Morris and Turnbull (2006)	Price and Gale (2006)	White (2007)	Crouch (2008)	Crouch (2010)	Child and Langford (2011)	Sanderson-Mann et al., (2012)	Locke et al., (2016)	Shaw & Anderson (2018)	Kolanko (2003) USA	Bjorklund (2011) Medical Sweden	Newlands et al. (2015) Medical	Murphy (2011) Radiography	Dearnley et al. (2010) Health & social care. Disabilities	Ryan and Brown, (2005) Australia
Self-aware/vigilant, double check	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Repeat	●			●	●				●							
To do list																
Write it down/audio notes	●	●		●				●	●						●	
Tick boxes																
Coloured pens			●													
Colour codes to identify drug names, type, doses																
Stickers, birth summaries, already prepared handover sheets																
Drop down menu																
Shorthand/symbols																
Mnemonics																
More time																
Neuro-linguistic programming anchoring																
Technology/Laptop, calculators																
Dragon Dictate, Dictaphone																
Coloured overlays																
Avoidance		●														
Helpful mentor																

## Conflicts of interest

None.

## Acknowledgements

Professor Richard Rose (Director of studies) Dr David Preece (First supervisor), Dr Sheena Bell (Second supervisor).

## Appendix 1. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.nepr.2018.12.008>.

## References

- American with Disability Act, 1990. Amendment Acts of 2008 PL 110-325 (S 3406. U.S. EEOC (Online) Available from: <https://www.eeoc.gov/laws/statutes/adaaa.cfm>, Accessed date: 15 February 2017.
- Bjorklund, M., 2011. Dyslexic students: success factors for support in a learning environment. *J. Acad. Librarian* 37 (5), 423–429. <https://doi.org/10.1016/j.acalib.2011.06.006>.
- British Dyslexia Association, 2017. Understanding Neurodiversity. A guide to Specific learning differences. Available at: [https://www.bdadyslexia.org.uk/common/ckeditor/filemanager/userfiles/A\\_Guide\\_to\\_SpLD\\_2nd\\_ed.pdf](https://www.bdadyslexia.org.uk/common/ckeditor/filemanager/userfiles/A_Guide_to_SpLD_2nd_ed.pdf), Accessed date: 28 October 2018.
- Broom, A., Willis, E., 2007. Competing paradigms and health research. In: Saks, M., Allsop, J. (Eds.), (2007) *Researching Health. Qualitative and Mixed Methods. Chapter 2*. Sage Publication ISBN 13: 9781412903639.
- Burns, E., Bell, S., 2010. Voices of teachers with dyslexia in Finnish and English further and higher educational settings. *Teachers and Teaching* 6 (5), 529–543. <https://doi.org/10.1080/13540602.2010.507964>, Accessed date: 5 July 2016.
- Child, J., Langford, E., 2011. Exploring the learning experiences of nursing students with dyslexia. *Nurs. Stand.* 25 (40), 39–46. <https://doi.org/10.7748/ns2011.06.25.40.39.c8565>.
- Cohen, L., Manion, L., Morrison, K., 2011. *Research Methods in Education*. (Chapter 8). 7th Edition Routledge. Abingdon Oxon. ISBN-13: 978-0415583367.
- Cowen, M., 2010. Dyslexia, Dyspraxia and Dyscalculia: a Toolkit for Nursing Staff, vol. 20 Royal College of Nursing, Cavendish Square. London RCN (online) Available from: [www.rcn.org.uk/direct](http://www.rcn.org.uk/direct), Accessed date: 24 August 2012.
- Crouch, A., 2008. Executive Summary: *Needs/experiences of Dyslexic Students + Support in Clinical Practice*. HEA for Health Sciences and Practice (online) Available from: [https://web.archive.org/web/20100531033934/http://www.health.heacademy.ac.uk/projects/miniprojects/completeproj/projectdocs2008/acrouch\\_execsummary/](https://web.archive.org/web/20100531033934/http://www.health.heacademy.ac.uk/projects/miniprojects/completeproj/projectdocs2008/acrouch_execsummary/), Accessed date: 1 December 2018.
- Crouch, A., 2009. Supporting Dyslexic Students in Clinical Practice. Poster Presented at the 'Stepping up' National Conference at the University of Chester. Available at: [https://www.researchgate.net/publication/264635925\\_Funded\\_Supporting\\_Dyslexic\\_Students\\_in\\_Clinical\\_Practice](https://www.researchgate.net/publication/264635925_Funded_Supporting_Dyslexic_Students_in_Clinical_Practice), Accessed date: 9 June 2018.
- Crouch, A., 2010. Experiences of Non-dyslexic and Dyslexic Nursing and Midwifery Students: How Best Can Their Needs Be Met by Personal Academic Tutor Support? Enhancing the Learner Experience in Higher Education (ELEHE). vol. 2. The University of Northampton, pp. 56–73. (1) ISSN 2941-3122. <https://doi.org/10.14234/elehe.v2i1.15>, Accessed date: 3 February 2016.
- Crouch, A.T., 2016. In: The Perceptions of How Dyslexia Impacts on Nursing and Midwifery Students and the Coping Strategies They Develop/use to Manage Difficulties Associated with Dyslexia in Clinical Practice: Embedded Case Study. PG Research Conference, Available from: <https://worresearch.wordpress.com/2016/07/01/postgraduate-research-conference-2016-seeds-of-knowledge/>, Accessed date: 30 November 2018.
- Crouch, A.T., 2017. The Perceptions of How Dyslexia Impacts on Nursing and Midwifery Students and the Coping Strategies They Develop/use to Manage Difficulties Associated with Dyslexia in Clinical Practice: an Embedded Case Study. Available from: <http://ethos.bl.uk/OrderDetails.do?did=1&uin=uk.bl.ethos.734338>, Accessed date: 26 March 2018.
- Dearnley, C., Elliot, J., Hargreaves, J., Morris, S., Walker, L., Walker, S., Arnold, C., 2010. Disabled people, effective practitioners: enabling a health care workforce that better reflects society. *Int. J. Interdiscipl. Soc. Sci.* 5 (8), 259–274. ISSN 1833-1882 Available from: <https://www.researchgate.net/publication/277218760>, Accessed date: 7 January 2016.
- Denzin, N.K., Lincoln, Y.S., 2013. *Collecting and Interpreting Qualitative Materials*, fourth ed. Sage, London ISBN-13: 978-1452258041.
- Department for Education, 2018. Widening participation in Higher education, England, 2016/17 age cohort-Official statistics. Available from: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/757897/WP2018-MainText.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/757897/WP2018-MainText.pdf), Accessed date: 30 November 2018.
- Department of Health DOH, 2002. The NHS Plan, a Plan for Investment, a Plan for Reform. The Stationery Office. London. Available from: [http://webarchive.nationalarchives.gov.uk/+www.dh.gov.uk/en/publicationsandstatistics/publications/publicationspolicyandguidance/dh\\_4002960](http://webarchive.nationalarchives.gov.uk/+www.dh.gov.uk/en/publicationsandstatistics/publications/publicationspolicyandguidance/dh_4002960).
- Disability Discrimination Act DDA, 1992a. (No 135, 1992 as Amended Jan 2014). The Office of Parliamentary Counsel, Canberra. Australia. Available from: <https://www.legislation.gov.au/Details/C2014C00013>, Accessed date: 19 July 2016.
- Disability Discrimination Act DDA, 1992b. No 135 1992, 2016. The Office of Parliamentary Counsel, Canberra. (Accessed 15 Sept 2016). <https://www.legislation.gov.au/Details/C2016C00763/Download>.
- Disability Discrimination Act. TSO, London.
- Dyslexia Research Institute, 2016. The Dyslexia Research Institute Mission. Available from: <http://www.dyslexia-add.org/>, Accessed date: 19 July 2016.
- Equality Act, 2010. The Stationery Office (Online) London. Available at: <http://www.legislation.gov.uk/2010?title=Equality%20Act%20>, Accessed date: 1 August 2016.
- Glaser, B.G., Strauss, A.L., 1999. *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Aldine Transaction. A division of Transaction Publishers, New Brunswick (USA) and London (UK).
- Hargreaves, J., Dearnley, C., Walker, S., Walker, L., 2014. The preparation and practice of disabled health care practitioners: exploring the issues. *Innovat. Educ. Teach. Int.* 51 (3), 303–314. <https://doi.org/10.100/14703297.2013.778048>, Accessed date: 23 November 2014.
- Howlin, F., Halligan, P., O'Toole, S., 2014. Development and implementation of a clinical needs assessment to support nursing and midwifery students with a disability in clinical practice: Part 1. *Nurse Educ. Pract.* 14 (5), 557–564. <https://doi.org/10.1016/j.nepr.2014.07.003>, Accessed date: 23 November 2014.
- Illingworth, K., 2005. The effects of dyslexia on the work of nurses and healthcare assistants. *Nurs. Stand.* 19 (38), 41–48. <https://doi.org/10.7748/ns2005.06.19.38.41.c3880>.
- Ingesson, S.G., 2007. Growing up with dyslexia. *Interv. Teenag. Young Adults: Sch. Psychol. Int.* 28 (5), 574–591. <https://doi.org/10.1177/0143034307085659>, Accessed date: 1 December 2014.
- Kolanko, K.M., 2003. A collective case study of nursing students with learning disabilities. *Nurs. Educ. Perspect.* 24 (5), 251–256.
- Locke, R., Alexander, G., Mann, R., Kibble, S., Scallan, S., 2016. Doctors with dyslexia: strategies and support. *Clin. Teach.* 13, 1–5. <https://doi.org/10.1111/tct.12578>.
- John Wiley and Sons Ltd and the Association for the study of Medical education, Accessed date: 11 November 2018.
- McGuckin, C., Shevlin, M., Bell, S., Devecchi, C., 2014. Moving to Further and Higher Education: an Exploration of the Experiences of Students with Special Education Needs. National Council for Special Education Report No 14 NCSE. Available from: [http://ncse.ie/wp-content/uploads/2014/10/Report\\_14\\_Higher\\_Ed\\_09\\_04\\_14.pdf](http://ncse.ie/wp-content/uploads/2014/10/Report_14_Higher_Ed_09_04_14.pdf), Accessed date: 25 May 2016.
- McLoughlin, D., Leather, C., 2013. *The Dyslexic Adult. Interventions and Outcomes. An Evidence-Based Approach*, second ed. BPS Blackwell978-1119-97393-5.
- Morris, D., Turnbull, B.N., 2006. Clinical experiences of students with dyslexia. *J. Adv. Nurs.* 54 (2), 238–247. <https://doi.org/10.1111/j.1365-2648.2006.03806.x>.
- Murphy, F., 2011. On being dyslexic: student radiographers' perspectives. *Radiography* 17 (2), 132–138. <https://doi.org/10.1016/j.radi.2010.08.005>, Accessed date: 8 February 2016.
- National Audit Office, 2007. Staying the Course: the Retention of Students in Higher Education. The Stationery Office (TSO Online). Available from: <https://www.nao.org.uk/wp-content/uploads/2007/07/0607616.pdf>, Accessed date: 16 November 2017.
- Newlands, F., Shrewsbury, D., Robson, J., 2015. Foundation doctors and dyslexia: a qualitative study of their experiences and coping strategies. *Postgrad. Med.* 91 (1073), 121–126. <https://doi.org/10.1136/postgradmedj-2014-132573>, Accessed date: 29 January 2016.
- Nicholson, R.L., Fawcett, A.J., Brookes, R.L., Needle, J., 2010. Procedural learning and dyslexia. *Dyslexia* 16 (3), 194–212. <https://doi.org/10.1002/dys.408>, Accessed date: 15 October 2014.
- Nursing and Midwifery Council, 2008. NMC Guidance: Good Health and Character: Guidance for Educational Institutions. NMC London NMC (online) Available from: [www.nmc-uk.org](http://www.nmc-uk.org), Accessed date: 22 June 2012.
- Nursing and Midwifery Council, 2009. Standards for Pre-registration Midwifery Education. pp. 68–69. NMC. London. NMC (online) Available from: <https://www.nmc.org.uk/globalassets/sitedocuments/standards/nmc-standards-for-preregistration-midwifery-education.pdf>, Accessed date: 23 May 2018.
- Nursing and Midwifery Council, 2010a. Standards for Pre-registration Nursing Education. NMC, London NMC (online) Available from: [www.nmc-uk.org](http://www.nmc-uk.org), Accessed date: 22 June 2012.
- Nursing and Midwifery Council, 2010b. *Disability; Reasonable Adjustments*. NMC, London.
- Nursing and Midwifery Council, 2015a. Standards for Pre-registration Midwifery Education. NMC Available from: [www.nmc-uk.org](http://www.nmc-uk.org), Accessed date: 16 August 2016.
- Nursing and Midwifery Council, 2015b. Standards for Pre-registration Nursing Education. NMC Available from: [www.nmc-uk.org](http://www.nmc-uk.org), Accessed date: 16 August 2016.
- Nursing and Midwifery Council, 2018. Standards for pre-registration nursing associates programmes. Available from: [www.nmc-uk.org](http://www.nmc-uk.org), Accessed date: 11 November 2018.
- Powell, A., 2018. People with Disabilities in Employment. House of Commons Available from: <http://researchbriefings.files.parliament.uk/documents/CBP-7540/CBP-7540.pdf>, Accessed date: 1 December 2018.
- Price, G., Gale, A., 2006. How do dyslexic nursing students cope with clinical practice placement? The impact of the dyslexic profile on the clinical practice of dyslexic nursing student: pedagogical issues and considerations. *Learn. Disabil.: Contem. J.* 4 (1), 19–36. ISSN:1937-6928 Available from: <http://web.a.ebscohost.com/ehost/pdfviewer/pdfviewer?sid=13605999-4092-46a1-9ea5-754a2715956d%40sessionmgr4009&vid=1&hid=4209>, Accessed date: 13 August 2016.
- Raskind, M.H., Goldberg, R.J., Higgins, E.L., Herman, K.L., 2002. Teaching life success to students with LD: lessons learned from a 20year study. *Interv. Sch. Clin.* 37 (4), 201–208. <https://doi.org/10.1177/105345120203700402>, Accessed date: 17 August

- 2016.
- Ridley, C., 2011. The experiences of nursing students with dyslexia. *Nurs. Stand.* 25 (24), 35–42. <https://doi.org/10.7748/ns2011.02.25.24.35.c8342/>.
- Robson, C., 2004. *Real World Research* (Chapter 6). second ed. Blackwell Publishing, Oxford, UK. ASIN B0184WR74M.
- Rose, R., Shevlin, M., 2016. The development of case studies as a method within a longitudinal study of special educational need provision in the Republic of Ireland. *JORSEN* 16 (2), 113–121. <https://doi.org/10.1111/1471-3802.12066>, Accessed date: 19 November 2016.
- Ryan, J., Brown, M., 2005. Just for them to understand better: the impact of learning difficulties at university. *Aust. J. Learn. Disabil.* 10 (1), 19–24. <https://doi.org/10.1080/19404150509546782>, Accessed date: 19 July 2016.
- Sanderson-Mann, J., Wharrad, H.J., McCandless, F., 2012. An empirical exploration of the impact of dyslexia on placement-based learning and a comparison with non-dyslexic students. *Divers. Equal. Health Care* 9, 89–99. Available from: <http://diversityhealthcare.imedpub.com/an-empirical-exploration-of-the-impact-of-dyslexia-on-placementbased-learning-and-a-comparison-with-nondyslexic-students.pdf>, Accessed date: 31 January 2016.
- St John-Matthew, J., Pace, K., Vogan, C., 2016. Supporting Radiography Learners with Dyslexia during Clinical Placement. *Imaging & Therapy Practice*. ISSN 2052-0727. Available from: <http://eprints.uwe.ac.uk/29749>, Accessed date: 28 November 2018.
- Shaw, S.C.K., Anderson, J.L., 2018. The Experience of Medical Students with Dyslexia. *An Interpretive Phenomenological*. *Dyslexia*. 2018. Wiley & Sons Ltd, pp. 1–14. <https://doi.org/10.1002/dys1587>. Available at: [www.wileyonlinelibrary.com/journal/dys](http://www.wileyonlinelibrary.com/journal/dys).
- Stern, P.N., Porr, C.J., 2011. *Essentials of Accessible Grounded Theory*. Walnut Creek, California. ISBN-13: 978-598746068.
- Tee, R., Owens, K., Plowright, S., Ramnath, P., Rourke, S., James, C., Bayliss, J., 2010. Being reasonable: supporting disabled nursing students in practice. *Nurse Educ. Pract.* 10 (4), 216–221. <https://doi.org/10.1016/j.nepr.2009.11.006>.
- Vellutino, F.R., Fletcher, J.M., 2007. Developmental dyslexia. In: Snowling, M.J., Hulmes, C. (Eds.), (2007) *The Science of Reading. A Handbook*. Blackwell Publishing Ltd, Oxford 978-1-4051-6811-3, (Chapter 19).
- Walker, S., Dearnley, C., Hargreaves, J., Walker, E.A., 2013. Risk, fitness to practise, and disabled health care students. *J. Psychol. Issu. Org. Cult.* 3 (4), 46–59. Available from: <https://doi.org/10.1002/jpoc.21081>, Accessed date: January 2017.
- White, J., 2007. Supporting nursing students with dyslexia in clinical practice. *Nurs. Stand.* 21 (19), 35–42. RCN Publishing Company Ltd. <https://doi.org/10.7748/ns2007.01.21.19.35.c4506>, Accessed date: 24 July 2007.
- World Health Organization, 2015. *International Classification of Diseases and Related Health Problems 10th Revision (ICD-10)-2015-WHO Version for; 2015 Chapter V. F81.0 Specific Reading Disorder*. Available from: <http://apps.who.int/classifications/icd10/browse/2015/en#/F81.0>, Accessed date: 17 February 2015.
- World Health Organisation, 2011. *World Report on Disability*. WHO (on line). Available from: [http://www.who.int/disabilities/world\\_report/2011/report.pdf](http://www.who.int/disabilities/world_report/2011/report.pdf), Accessed date: 3 January 2017.
- Wray, J., Aspland, J., Taghzouit, J., Pace, K., 2013. Making the nursing curriculum more inclusive for students with specific learning difficulties: embedding specialist study skills into a core module. *Nurse Educ. Today* 33 (6), 602–607. <https://doi.org/10.1016/j.nedt.2012.07.009>.
- Wray, J., Aspland, J., Taghzouit, J., Pace, K., Harrison, P., 2012. Screening for specific learning difficulties: the impact upon progression of pre-registration nursing students. *Nurse Educ. Today* 32 (1), 96–100. <https://doi.org/10.1016/j.nedt.2011.01.021>.
- Yin, R.K., 2009. *Case Study Research Methods Fourth Edition*. *Applied Social Research Methods Series, vol. 5* SAGE Publications. Inc ISBN-13:978-1412960991.