ORIGINAL RESEARCH

A study to evaluate the introduction of simulation as a teaching strategy for the mental health and learning disability fields of nursing in an undergraduate nursing curriculum within one higher education institution in the UK

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Abstract

High Fidelity Simulation or Human Patient Simulation is an educational strategy embedded within nursing curricula throughout many healthcare educational institutions. This paper reports on an evaluative study that investigated the views of a group of Year 2 undergraduate nursing students from the mental health and the learning disability fields of nursing (n = 75) in relation to simulation as a teaching pedagogy. The study took place in the simulation suite within a School of Nursing and Midwifery in the UK. Two patient scenarios were used for the session and participants completed a 22-item questionnaire consisting of three biographical information questions and a 19-item Likert scale. Descriptive statistics were employed to illustrate the data and non-parametric testing (Mann-Whitney U test) was employed to test a number of hypotheses. Overall students were positive about the introduction of patient scenarios using the human patient simulator into the undergraduate nursing curriculum. This study used a small, convenience sample in one institution and therefore the results obtained cannot be generalised to nursing education before further research can be conducted with larger samples and a mixed-method research approach. However these results provide encouraging evidence to support the use of simulation within the mental health and the learning disability fields of nursing, and the development and implementation of further simulations to complement the students' practicum.

Key Words: High fidelity simulation, Mental health, Learning disability, Patient scenarios, Pedagogy

1 Introduction and background

High Fidelity Simulation or Human Patient Simulation (HPS) is an educational strategy embedded within nursing curricula throughout many healthcare educational institutions. It is endorsed by nursing professional bodies in the United Kingdom (UK) such as the Nursing and Midwifery Council (NMC),[1] and in the USA the National Council of State Boards of Nursing[2] and the National League for Nursing (NLN).[3] Through the use of HPS and patient scenarios, clinical situations can be created for students to practise clinical skills and apply theoretical knowledge in a simulated setting. The debriefing session afterwards affords students reflection time on the experience, where gaps in knowledge and areas to improve upon are identified. Hovancsek states that the aim of simulation is "to replicate some or nearly all of the essential aspects of a clinical sce-

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nario so that the situation may be more readily understood and managed when it occurs for real in clinical practice" (p.3).[4] Simulation allows students to practise skills in a safe environment that replicates the reality of the clinical situation. Procedural techniques, decision making and critical thinking skills are demonstrated and challenged. Buykx and colleagues allude to consolidation of theory into practical skills; demonstration of clinical skills in a protected environment; a practical learning opportunity in the face of a growing scarcity of practice placements available; immediate feedback and supporting inter-professional work as advantages to the use of simulation.[5] This process of practice and feedback can help students develop confidence and competence prior to delivering care in real practice settings. Indeed the use of simulation training has been linked with increased confidence levels and self-reported knowledge among nursing and medical students.[6–9]

At present, some higher education institutions (HEI's) experience difficulty in matching the growing numbers of healthcare professional students to the limited number of practice placements available. As a result health care students are exposed to a reduced number of experiential learning opportunities. Miller and Bull explain that, coupled with this challenge, the increasing expectation from service providers means that higher education institutions must mirror the commitment to providing high quality patient care in a safe environment.[10] The NMC Simulation and Practice Learning project[11] findings confirmed that simulation, within the pre-registration nursing curriculum in the United Kingdom (UK), may be used in support of providing direct care in clinical settings. Further recommendations, following publication of the NMC Standards for pre-registration nursing education in 2010, have called for an introduction of clinical skills teaching earlier in undergraduate programmes and an increase in the use of clinical simulation centres to promote interpersonal and practice skills, directly employing simulation learning strategies.[12] Similarly, respondents in another small-scale study with third year undergraduate nursing students indicated that 'simulation sessions should begin at the start of training'.[13] In response to this agenda, health-care education providers have increased the use of simulation-based education in both undergraduate and postgraduate programmes. Whilst it is not intended that simulation will replace student contact with real patients and the clinical environment, it does afford the opportunity to practise skills and gain knowledge prior to practice placements and in conjunction with clinical placements.

HPS was initially used in the adult and children's field of nursing in the authors' institution. The introduction of a new undergraduate curriculum in 2012 provided the opportunity to extend simulation into all fields of nursing; consequently students studying learning disability nursing and mental health nursing were exposed to this new type of teaching for the first time during 2013. Luther Szpak and Kameg[14] explain that mental health and learning disability nursing are specialities that focus on the acquisition of knowledge and the use of communication skills. Often such patients are medically stable but require interventions based on principles of effective therapeutic communication techniques and establishing a therapeutic nurse-patient relationship.[14] Study findings have indicated that nursing students display anxiety, fear and negativity prior to beginning these specialist areas.[14,15] Consequently this could prove a barrier for both learning and building up therapeutic relationships with patients.

A study conducted by Sleeper and Thompson[16] indicated that the use of HPS could provide an alternative strategy for improving the effectiveness of student therapeutic communication techniques, while decreasing student anxiety. This was further supported by the results of a study conducted by Luther Szpak and Kameg[14] which used HPS with mental health nursing students, prior to commencing a practice placement and interacting with patients. The results indicated that an experience with HPS helped decrease the students' level of anxiety and they had an overall positive experience with simulation. Although research in the area of HPS with mental health and learning disability students is limited, the above results, and also a similar study by Kameg and colleagues,[17] support the use of simulation to lower student anxiety and improve self-efficacy in terms of communicating with a patient with learning disability or mental health problems.

Recognising this, a team of lecturers, in the project reported here, devised patient scenarios to be used with a human patient simulator for undergraduate mental health and learning disability nursing students. This paper reports on an evaluative study that investigated the views of a student group in relation to this teaching pedagogy at a midway point in the module. The study had the following hypotheses:

(1) There are differences between the views of mental health and learning disability students in relation to the introduction of patient scenarios, using the HPS, to the nursing sciences undergraduate curriculum.
(2) There are differences between the views of mental health and learning disability students in relation to the introduction of patient scenarios using HPS into all fields of nursing.
(3) There are differences between mental health and learning disability students' views on perceived stress levels with the introduction of patient scenarios using the HPS.
(4) There are differences between mental health and learning disability students' views on using patient scenarios with HPS and its relevance in linking theory to practice.
(5) There are differences between mental health and learning disability students' views on using patient scenarios with HPS and its perceived effect on con-

fidence levels.

(6) There are differences between mental health and learning disability students' views on using patient scenarios with HPS and its perceived effect on clinical practice.

2 Methods

2.1 Participants

This evaluation of the teaching methodology was conducted in the School of Nursing and Midwifery within a university in the UK, with Year 2 undergraduate nursing students, the total cohort of the mental health and learning disability fields of nursing in this university. These students were participating in a human patient simulation session, as a compulsory element of a Year 2 module. Seventy-five students in total participated in the session (n = 75) of which 29 students were from the learning disability field (n = 29) and 46 from the mental health field (n = 46).

2.2 Measures

Two patient scenarios were used for the session. A 22-item questionnaire, incorporating 19 Likert items, was devised. A five point scale consisting of "uncommitted", "strongly disagree", "disagree", "agree", "strongly agree" was used. There was a comment box at the end of the questionnaire allowing respondents to elaborate, clarify or explain their answers.

The questionnaire was previously used in a pilot study with students from the adult and children's fields. They were asked to comment on its ease of completion and any difficulties encountered with interpreting questions. To ensure face and content validity, the questionnaire was also submitted to members of the school's simulation team who made suggestions for the adequacy and relevance of the questions. Following this process minor amendments were made. The questionnaires were distributed to students at the end of the HPS session. All students (n = 75) completed the questionnaire.

2.3 Ethical considerations

As this study was a midway evaluation of simulation as part of a module within the curriculum, ethical approval was not required, however informed consent was gained from the participating students. All questionnaires were anonymous, maintaining confidentiality for the student respondents.

2.4 Data analysis

The main analysis consisted of comparing the views of mental health and learning disability students in relation to the use of patient scenarios with the HPS. This was carried out for each of the hypotheses and non-parametric testing (Mann-Whitney U Test) was employed for this purpose. Data from the questionnaire were coded and analysed using the Statistical Package for the Social Sciences (SPSS) for Windows version 19.0. Descriptive statistics were used to describe and synthesise the data.

3 Results

The sample comprised ten (10) males (13%) and 65 females (87%). Fifty-six percent (56%) of the sample were aged between 19-27 years; 23% were in the 28-32 year age group and 3% were 40 years and over. Sixty-one percent (61%) were students from the mental health field (n = 46) and 39% were students from the learning disability field (n = 29). A full data set was present with regards to demographics. There was no missing data.

Non parametric hypothesis testing

Hypothesis 1: There are differences between the views of mental health and learning disability students in relation to the introduction of patient scenarios using the HPS to the nursing sciences undergraduate curriculum.

In order to test this hypothesis, the students' answers to the first Likert item: 'The introduction of patient scenarios using the HPS would be essential to the undergraduate nursing sciences course' were compared using a Mann-Whitney U Test.

Table 1 shows that no students from either field (mental health and learning disability) strongly disagreed that the introduction of patient scenarios using HPS was essential to the nursing sciences undergraduate curriculum. With the exception of two respondents from mental health, all of the participants either agreed or strongly agreed with the statement: 'The introduction of patient scenarios using the HPS would be essential to the undergraduate nursing sciences course'.

Table 1: Field and Likert item 1 Cross-tabulation

		The introduction of patient scenarios using the HPS would be essential to the undergraduate nursing sciences course				
		Uncommitted	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
Field	Mental health	1	0	1	14	30
	Learning disability	0	0	0	3	26
Total		1	0	1	17	56

The main values that should be considered in the output are the U and Z values and the significance level, which is Asymp.Sig (2-tailed).[18] In this instance the U value is 501.000 and the Z value is -2.388 with a significance level (p) of $p = .017$. The probability value (p) is less than .05, so the result is significant. Therefore there is a statistically significant difference in the views of the samples of mental health and learning disability students in relation to use of the human patient simulator and patient scenarios and its importance to the undergraduate curriculum. This may be due to the smaller numbers in the learning disability field and small sample size. However, the median values (see Table 2) suggest that they were the same across the two fields (n = 75, median value 6 for both fields).

Table 2: Views on the use of HPS in undergraduate nursing science course

Field	N	Median
Mental health	46	6.00
Learning disability	29	6.00
Total	75	6.00

Hypothesis 2: There are differences between the views of mental health and learning disability students in relation to the introduction of patient scenarios using HPS into all fields of nursing.

In order to test this hypothesis, the students' answers to the fourth Likert item: 'Patient scenarios using the HPS should be made available to all nursing students across ALL fields' were compared using a Mann-Whitney U Test. The test revealed that there was no significant difference in the views of mental health and learning disability students in relation to the introduction of patient scenarios with the HPS into all fields of nursing – their views were the same ($p = .11$, Mann-Whitney U = 588.5, Z = -1.60 (rounded).

Hypothesis 3: There are differences between mental health and learning disability students' views on perceived stress levels with the introduction of patient scenarios using the HPS.

A Mann-Whitney U test was again used to compare the students' answers to Likert items 9 'The introduction of patient scenarios using the HPS would make the undergraduate course too stressful' and 14 'Participating in the patient scenarios has made me more anxious about my future clinical placements'. The scores from these questions were combined into a single score of 'perceived stress', by creating a total score. The findings are illustrated using a clustered bar chart (see Figure 1).

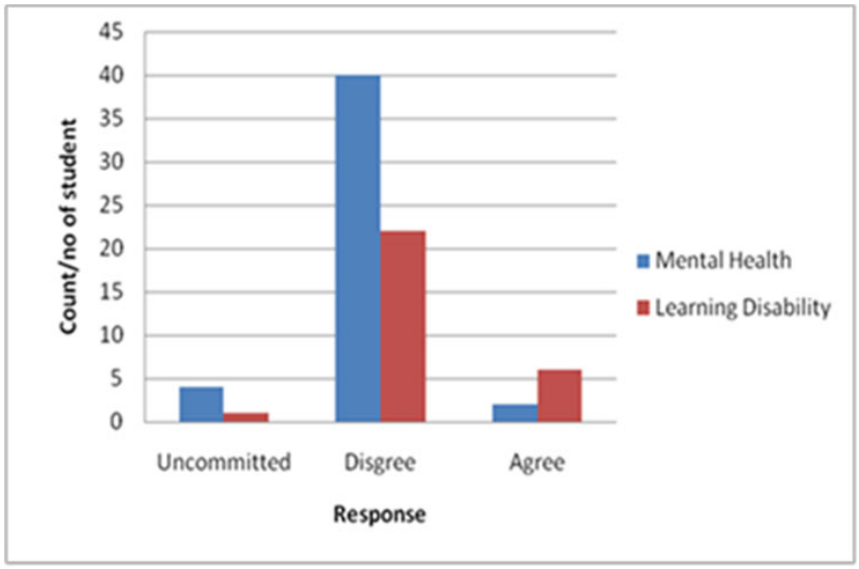

Figure 1: Mental health and learning disability students' views on perceived stress levels with introduction of patient scenarios using HPS

Table 3 highlights the scores for combined items number 9 and 14. Overall these scores demonstrate that the majority of students did not find the introduction of patient scenarios using the HPS too stressful. Note that, in examining the scores, an assumption was made that having a combined score ≤ 4, indicated that the students generally disagreed overall with the statements, that use of patient scenarios with HPS was too stressful or made them more anxious.

A Mann-Whitney U Test revealed no significant difference in perceived stress levels of mental health and learning disability students in relation to the introduction of patient scenarios using the HPS ($p = .236$, Mann-Whitney U = 562.500, Z = -1.185).

Table 3: Perceived levels of stress cross tabulation

	Views on perceived levels of stress (combined items 9 and 14)							
	Disagree					Agree		
Summary Score	0	1	2	3	4	5	6	Total
Mental health	4	2	9	9	20	2	0	46
Learning disability	1	1	7	4	10	3	3	29
Total	5	3	16	13	30	5	3	75

Hypothesis 4: There are differences between mental health and learning disability students' views on using patient scenarios with HPS and its relevance in linking theory to practice.

In order to test this hypothesis, the students' answers to the Likert item: 'The introduction of patient scenarios using the HPS would help me to see the relevance of the subjects taught in the theory modules' were compared. Figure 2 illustrates the results in a clustered bar chart.

The Z value is -1.437 and the U is 552.000 while the significance level is $p = .151$, *i.e.* there is no significant difference in the views of mental health and learning disability students using the HPS and its relevance in linking theory with practice. Figure 2 illustrates how both learning disability and mental health students agreed or strongly agreed that the introduction of HPS with patient scenarios was important in helping them link theory to practice.

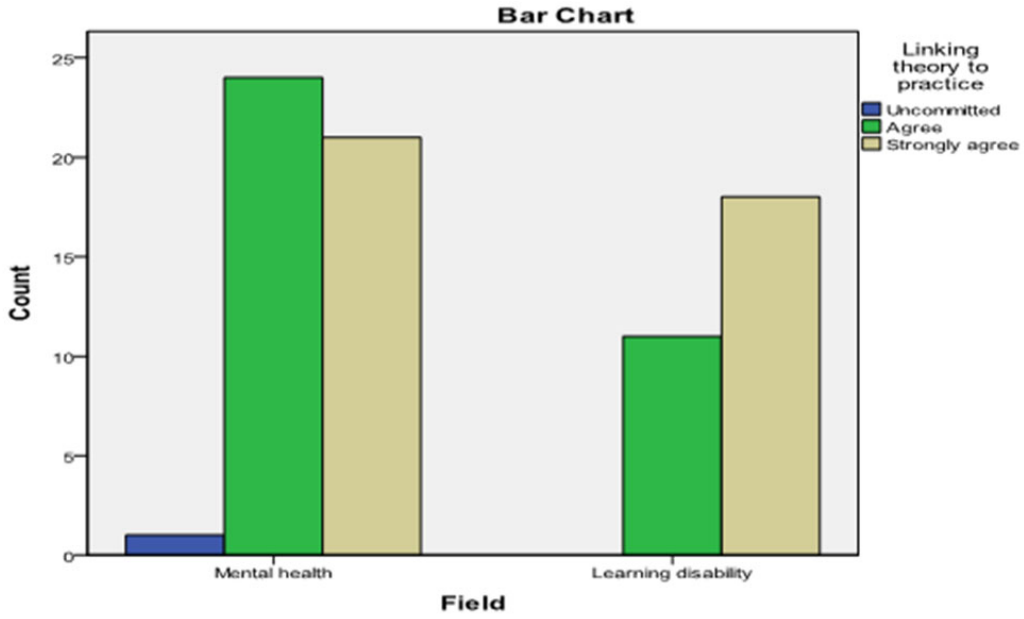

Figure 2: Bar chart illustrating students views on introduction of patient scenarios using the HPS and importance in linking theory to practice

Hypothesis 5: There are differences between mental health and learning disability students' views on using patient scenarios with HPS and its perceived effect on confidence levels.

This hypothesis was tested using the students' answers to Likert items 18 'Completing the patient scenarios using the HPS has given me more confidence' and 19 'Having completed the patient scenarios I now feel more confident about dealing with similar situations I may encounter in clinical practice', to establish if there were differences between the two fields. The combined scores from these questions were treated as a single score of 'perceived confidence' with a score of 4 or less indicating general disagreement and a score of 4 or above indicating general agreement. Figure 3 illustrates the responses for each field as a bar chart.

The Mann Whitney U test showed that the U value is 595.500 and the Z value is -0.795 (-0.80 rounded) with significance level $p = .427$.

This reveals that there is no significant difference in the views of the samples of mental health and learning disability students using the HPS and its perceived effect on confidence levels.

Hypothesis 6: There are differences between mental health and learning disability students' views on using patient scenarios with HPS and its perceived effect on clinical practice.

Three items (Likert items 8 'The introduction of patient scenarios using the HPS will have a positive influence on my ability to perform in clinical practice', 11 'The use of the HPS helped me test my clinical skills' and 13 'The introduction of patient scenarios using the HPS to the undergraduate

nursing programme would contribute greatly to my ability to carry out holistic care') were used to provide a summary score for 'perceived effects on clinical practice' of using patient scenarios with the HPS. Figure 4 illustrates the findings.

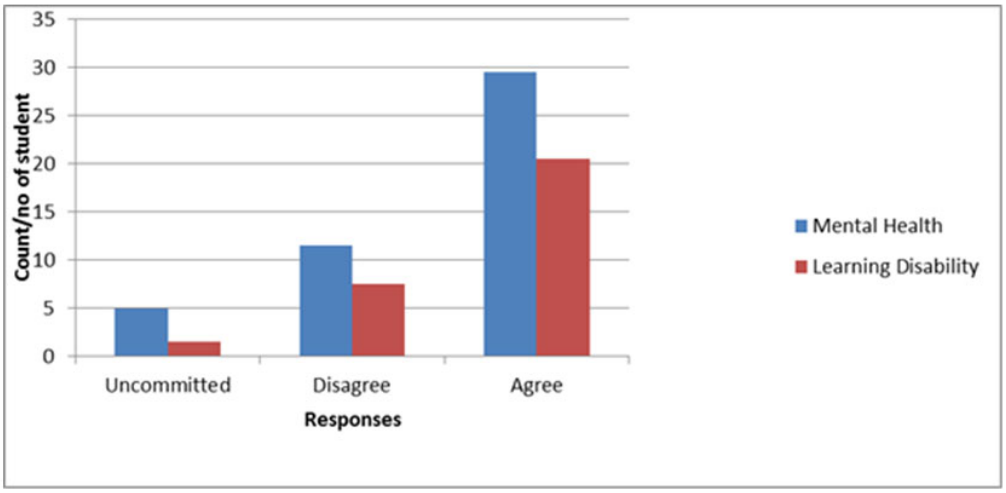

Figure 3: Bar chart illustrating mental health and learning disability students' views on perceived confidence and using patient scenarios with the HPs

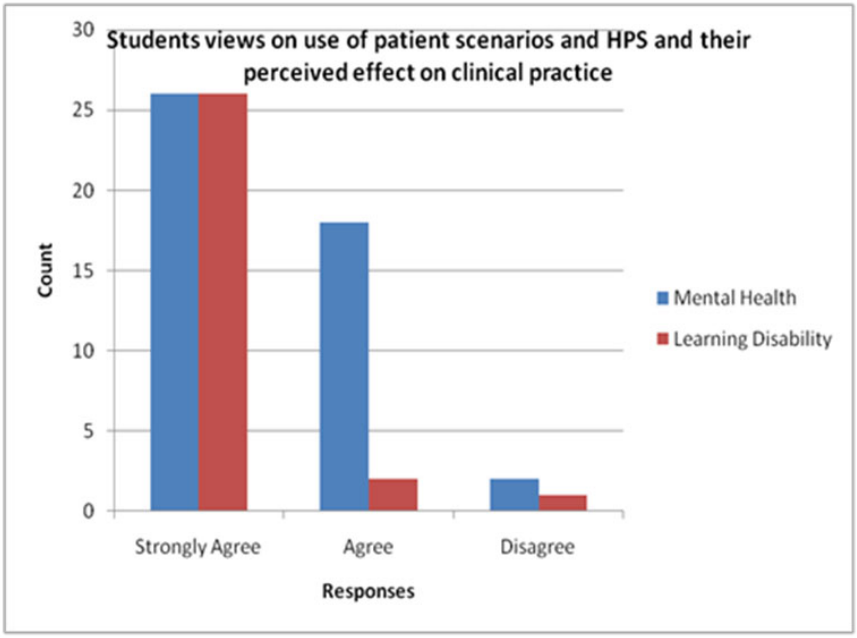

Figure 4: Illustrating the views of mental health and learning disability students in relation to using patient scenarios and the HPS and its perceived effects on clinical practice

In general, students who obtained a summary score of 11 or more were deemed as strongly agreeing with the statements overall. Those scoring 7-10 were deemed to agree with the statements and those scoring 6 or less, appeared to disagree (see Table 4).

The results of the Mann Whitney U test for these three statements are presented in Table 5. The test revealed that there is significant difference in the views of the sample only for Likert item 13 'The introduction of patient scenarios using the HPS to the undergraduate nursing programme would contribute greatly to my ability to carry out holistic care' (p = .032).

Table 4: Perceived effects on clinical practice cross-tabulation

	Views on effects on clinical practice (combined items 8, 11 and 13)								
	Disagree		Agree				Strongly Agree		
Summary Score	4	6	7	8	9	10	11	12	Total
Mental health	1	1	1	1	7	9	8	18	46
Learning disability	0	1	1	0	0	1	10	16	29
Total	1	2	2	1	7	10	18	34	75

Table 5: Test statistics*

	Ability to perform clinical practice	Test clinical skills	Ability to carry out holistic care
Mann-Whitney U	533.000	546.500	493.500
Wilcoxon W	1614.000	1627.500	1574.500
Z	-1.844	-1.799	-2.147
Asymp. Sig. (2-tailed)	.065	.072	.032

* Grouping Variable: Field

However there is no significant difference in their views for the other two items 8 and 11 in relation to using the HPS and its perceived effect on clinical practice. Table 4 shows that the field students are registered with is associated with the strength of their views on the effect of using HPS in clinical practice for the 'Agree' responses while there is no difference between the two fields for the 'Strongly Agree' category.

4 Discussion

Non-parametric testing found a statistically significant difference in the views of mental health and learning disability students in relation to use of patient scenarios and the HPS and its importance to the undergraduate curriculum. This may be due to the smaller numbers in the learning disability field and small sample size. There were no differences in the views of mental health and learning disability students' views on the introduction of patient scenarios using the HPS into all fields of nursing. Both student groups either agreed or strongly agreed that all fields would benefit from this teaching pedagogy. This supports the results from a study by Howard and colleagues[19] who advocate the integration of high fidelity human simulation experiences throughout the curriculum and within varied fields. Gough and colleagues[20] also recognise that inter-professional simulation-based education (IPSE) is a beneficial teaching strategy for all professions at undergraduate level.

There were no differences in the views of mental health and learning disability students on the introduction of patient scenarios with the HPS and perceived stress levels. Both fields' groups of students regarded this teaching strategy as not too stressful, and not increasing their anxiety. There are varying views in the literature pertaining to perceived stress levels and anxiety associated with simulation experiences. Lasater[21] revealed that an emergent theme in the literature was that simulation was stressful, although low risk. Jarzemsky and Mc Grath[22] and Partin and colleagues[23] suggest that simulation exercises decrease anxiety, whilst Bremner and colleagues[24] found no significant difference in anxiety levels after the simulation experience. McCaughey and Traynor also reported how participants in a similar study expressed the view that participating in such simulations made them more anxious 'but in a good way'.[13]

In the study reported here the questionnaire was completed after students had participated in the simulation exercise, therefore students' anxiety levels may have been lower, with a sense of relief having completed the exercise. If the questionnaire was completed prior to undertaking the exercise, anxiety levels may have been higher.

There were no differences between learning disability and mental health students in relation to the introduction of patient scenarios using the HPS and its impact on linking theory to practice and its perceived effect on confidence levels. This affirms the positive effect which participation in simulated learning has on a year 2 nursing student's learning, and the student's perception of the simulation's clinical effectiveness. The data from this study also extends findings by Hope and colleagues[25] who established that simulation supported the integration of theory and practice, whilst Morgan[26] found that 96% (n = 89) of nursing students undertaking high fidelity simulation, confirmed that they used the achieved skills whilst on clinical placement. The findings reported here, in relation to perceived confidence levels using patient scenarios and the HPS were encouraging, and the same findings were also reflected in McCaughey and Traynor's study[13] in that simulation was deemed by 93% (n = 86) of respondents to increase their overall confidence and assurance in their clinical judgment.

Hypothesis six was the only area, besides hypothesis one, whereby the field of nursing influenced the students' views to some extent. Three Likert items made up the 'perceived effects of HPS on clinical practice' summary score and for two of them there was no significant difference between the two sample groups. The third statement regarding the HPS contributing to the students' ability to carry out holistic care

revealed significant difference between the two groups (p = .032).

A cross-tabulation between the field of study and the perceived effect of HPS on clinical practice revealed that both groups 'strongly agreed' to the same extent with the three statements (n = 26 for both fields); however far fewer learning disability students (n = 2) opted for the 'agree' category compared to those from the mental health group (n = 18).

Overall the results provide encouraging evidence to support the use of simulation with mental health and learning disability students. Results of the study are comparable with previous studies on this teaching strategy, further enhancing the validity of the findings. The anomaly of the positive impact of simulated learning and the perceived anxiety associated with the experience necessitates the requirement for skilled, informed facilitators and effective debriefing, during and following the patient scenarios. However, as McCaughey and Traynor[13] highlight, the debriefing and reflection post-simulation should not only foster student progress, it should also challenge and alleviate shortcomings.

Study limitations

This study was conducted in a single institution using a convenience sample. The findings therefore may only be interpreted within that context. The sample size is small (n = 75) therefore the results should be interpreted with caution and the findings should not be generalised to all nursing education students from this one study. Further quantitative studies should be employed with larger samples, perhaps with learning disability and mental health students from other institutions. Adopting a mixed methods model through the use of interviews or focus groups would also provide valuable insights into the students' experiences. Future research with students from different years and different institutions would allow a more robust exploration of the phenomena under investigation. Combining scores and creating a composite variable would in itself merit further research, as this may not be deemed a reliable method of data analysis.

5 Conclusion and implications for practice

This was the first time that mental health and learning disability students participated in a simulated exercise using patient scenarios and the HPS in this particular institution. The results provide encouraging evidence to support the use of simulation within these fields of nursing. The students' readiness to learn and willingness to reflect on the experience can contribute positively to bridging the theory practice gap. Kolb[27] aptly summarises that experimenting with different skills can help improve one's competency and help to conceptualise abstract ideas, which is what this simulation exercise provided. Cioffi[28] highlights that there is currently a lack of research to address the challenges of implementing simulations which meet the educational needs of nursing students as effectively as actual practicum experiences afford. Therefore, further research is required that focuses on the development and implementation of mental health and learning disability simulations as alternatives to tests with real patients and to complement practicum experiences.

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Conflicts of Interest Disclosure

The authors declare that there is no conflict of interest.

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