Research article

# Nursing students' interprofessional socialisation and readiness for interprofessional learning: A cross-sectional research study

Katherine McGreal [a], Lisa Beccaria [b,c], Gavin Beccaria [a,c,*]

[a] School of Psychology and Wellbeing, Faculty of Health, Engineering and Sciences, University of Southern Queensland, Toowoomba, Australia
[b] School of Nursing and Midwifery, Faculty of Health, Engineering and Sciences, University of Southern Queensland, Toowoomba, Australia
[c] Institute for Resilient Regions, Centre for Health Research, University of Southern Queensland, Toowoomba, Australia

ABSTRACT

*Background:* Interprofessional education programs in university settings have facilitated the development of student attributes needed to become a team-player, understand roles and responsibilities of other health disciplines, and acquire knowledge to deliver patient-centred care. Although the benefits of interprofessional education are widely acknowledged, there is limited research on interprofessional socialisation within university contexts.
*Objectives:* To examine readiness of undergraduate nursing students for interprofessional learning and interprofessional socialisation.
*Design:* A cross-sectional design was used to examine the correlation between interprofessional learning and socialisation, and group differences between mode of study, year level, and prior healthcare experience.
*Setting:* A large Australian regional university, across two campuses.
*Participants:* A total of 103 undergraduate nursing students across year levels, including 58 enrolled on-campus, and 45 studying externally.
*Method:* Students completed an online survey using the Readiness for Interprofessional Learning Scale and the Interprofessional Socialisation and Valuing Scale. Data analyses included independent *t*-tests, and a one-way between subjects ANOVA.
*Results:* No significant differences in student readiness for interprofessional learning or interprofessional socialisation were found between on-campus and external modes of study and between healthcare experience and no prior healthcare experience. Participants with previous healthcare experience had significantly higher scores for interprofessional socialisation than those with no previous healthcare experience.
*Conclusions:* Readiness for interprofessional learning and interprofessional socialisation and were not impacted by the students' mode of study; however, previous experience in the healthcare industry and duration of study significantly improved interprofessional socialisation skills. As nursing students advance through their study, they may experience interprofessional education opportunities that influence their perceived socialisation skills.

## 1. Introduction

Interprofessional education (IPE) is an innovative strategy that has been successfully implemented into university and healthcare settings to improve communication and teamwork practices (World Health Organization, 2010). IPE takes place when students and health professionals from multiple disciplines learn together, and from each other, to facilitate effective collaborative practices (World Health Organization, 2010). This leads to graduates who can work together with clients, relatives, and society at large to deliver optimal services across all health facilities (World Health Organization, 2010). Within healthcare settings, IPE is associated with enhanced patient outcomes, improved staff morale and a strengthened workforce (Barner and Hromadik, 2020; Mickan, 2005; Wei et al., 2022; World Health Organization, 2010).

It is logical for universities to embed IPE within their educational frameworks. Health students need to cultivate essential characteristics that are required to function within interprofessional workplaces. University IPE programs support the development of positive attitudes

toward interprofessional learning, improve communication skills, and provide students with a greater understanding of other health worker roles and responsibilities (Filies and Frantz, 2021; Lucas et al., 2019). For IPE to be successfully implemented, it is essential to understand how members of the healthcare team interact with each other (Arndt et al., 2009). Khalili et al. (2013) suggest that conventional methods of teaching role-specific information have promoted professional identities within professional silos, inhibiting the cultivation of integrative professional identities. The transformation of student attitudes, beliefs, and behaviours is necessary for facilitating the development of collaborative professional identities (Khalili et al., 2013).

There is currently limited research on interprofessional socialisation within university contexts, although the benefits of IPE are widely acknowledged within the literature. This study aimed to evaluate nursing students' readiness for shared learning and interprofessional socialisation across two university campuses.

## 2. Background

According to Herath et al. (2017), IPE programs within university settings focus on teaching student's values and skills that improve interprofessional capabilities. Training methods include the following: the delivery of lectures and tutorials from multiple health disciplines; problem and case-based scenarios; simulated activities; and work and competency-based approaches (Herath et al., 2017; Maddock et al., 2022). Simulated activities centre on building interpersonal skills and leadership qualities; while community placements focus on collaborative practices and how patients can receive high quality care (Bridges et al., 2011; De La Rosa et al., 2019). The aim of IPE teaching programs is for students to develop the skills needed to become team players, understand the roles and responsibilities of other professionals, and possess the knowledge needed to deliver patient-centred care (Bridges et al., 2011; Oxlad et al., 2021).

IPE readiness is conceptualised as the perceptions and attitudes students hold in relation to their willingness to participate in collaborative learning (Ganotice and Chan, 2022; McFadyen et al., 2005). The literature suggests that health students generally exhibit positive attitudes toward working together in collaborative team environments (Algahtani et al., 2021; Al-Qahtani, 2016; Olenick et al., 2010). However, several factors may influence a student's level of readiness for interprofessional learning; including, health discipline (Judge et al., 2015; Wilhelmsson et al., 2011), gender (Hertweck et al., 2012; Huebner et al., 2021; Wilhelmsson et al., 2011), duration of study (Al-Qahtani, 2016; Axelsson et al., 2019), exposure to IPE and collaborative experiences during undergraduate training (Hood et al., 2014; Oxlad et al., 2021), year level (Filies and Frantz, 2021; King et al., 2012), and previous work history within healthcare settings (Huebner et al., 2021; Judge et al., 2015).

Interprofessional socialisation is defined as a transactional process where health professionals learn how to interact with each other in a collaborative work environment (King et al., 2010). Interprofessional socialisation is assessed by measuring the transformation of a person's attitudes, beliefs, and behaviours toward their own job responsibilities and other healthcare roles, whilst providing team-based care to their clients (Bloomfield et al., 2021; King et al., 2010). The provision of collaborative care is a complex process, which involves multiple professions working together with varying levels of skills and experience (King et al., 2010).

Understanding how professionals work together is pivotal for reducing barriers to implementing effective team-based care (Arndt et al., 2009). Khalili et al. (2013) suggests a three-step process for enhancing health care students' interprofessional socialisation skills: (1) eliminate misunderstandings about professional roles; (2) aid students in learning about other healthcare roles and support their participation in collaborative experiences; and (3) enable students to critically reflect on their own collaborative relationships with other health disciplines.

This can foster the development of professional and interprofessional identities (Khalili et al., 2013).

As concepts of both readiness and socialisation attitudes and skills are important for student learning, this research posed the following questions: 1) Is there a.

statistically significant correlation between readiness for IPE and interprofessional socialisation? 2) Are there differences between students in terms of mode of study and healthcare experience in relation to interprofessional socialisation and readiness for learning readiness for IPE and 3) Does duration of study lead to an increased readiness for interprofessional socialisation and readiness of learning?

## 3. Methods

### 3.1. Aim

The overall aim of this research was to evaluate nursing students' readiness for shared learning and interprofessional socialisation. Specifically, this study examined the associations between interprofessional readiness for learning and interprofessional socialisation, and mode of study, duration of study, and previous healthcare experience.

### 3.2. Design

A cross-sectional design was used to examine the correlation between interprofessional readiness for learning and socialisation, and group differences between mode of study, year level, and prior healthcare experience.

### 3.3. Participants

The participants were health students recruited from a regional Australian university, 103 nursing students completed the survey and were included in the analyses. Eligibility criteria included being 18 years or older and currently enrolled in an undergraduate nursing program at the university at the time of the study.

### 3.4. Survey instrument measures

#### 3.4.1. Student demographic information
The demographic sheet contained information on age, gender, mode of study (for example, on-campus/external), level of education, employment information, citizenship status, and ethnicity.

#### 3.4.2. Readiness for interprofessional learning
The Readiness for Interprofessional Learning Scale (RIPLS) (McFadyen et al., 2005) was used to assess the students' perceptions of their willingness to participate in collaborative learning. The Readiness for Interprofessional Learning Scale is a 19-item tool with a 5-point Likert scale that ranges from the value of 1 'strongly disagree' to the value of 5 'strongly agree'. The full-scale Readiness for Interprofessional Learning Scale demonstrates good internal consistency in the English version and several other languages (Ganotice and Chan, 2018; Ganotice and Chan, 2022; McFadyen et al., 2005). In this study, acceptable internal consistencies were found for three of the four subscales (teamwork & collaboration $\alpha = 0.79$–$0.88$; negative professional identity $\alpha = 0.60$–$0.76$; positive professional identity $\alpha = 0.76$–$0.81$; roles & responsibilities $\alpha = 0.40$–$0.43$).

#### 3.4.3. Interprofessional socialisation
The Interprofessional Socialisation and Valuing Scale (ISVS-24; (King et al., 2010) is a 24-item self-report measure that assesses interprofessional socialisation skills and readiness to function within a team environment. Subscale scores are calculated by obtaining the mean item score, which allows for comparisons to be made between subscales with varying numbers of items (King et al., 2010). Higher scores indicate

greater levels of interprofessional socialisation (King et al., 2010). The Interprofessional Socialisation and Valuing Scale demonstrates strong internal consistencies for the overall scale ($\alpha$ =0.90) and all three sub-scales with alpha coefficients ranging from 0.79 to 0.89 (King et al., 2010).

### 3.5. Data collection

Ethics approval (No. H19REA299) was obtained prior to data collection from the university Human Research Ethics Committee. Convenience sampling and a cross-sectional online survey design was used to collect data between May to June 2020. The participants were recruited via email after they were identified from a database of undergraduate students.

### 3.6. Data analysis

Data analyses were performed using IBM SPSS V.20. Effect sizes (Cohen's *d*) for significant *t*-test results were computed using an online statistical calculator from Social Science Statistics (Stangroom, 2020). A priori analysis was conducted using G*Power3 (Faul et al., 2007) to calculate the power of each statistical test used in the study.

Statistical power was determined for all three statistical tests (correlation, independent *t*-test, and ANOVA) using a two-tailed test, a medium effect size, an alpha of 0.05 and a power of 0.80. The minimum required sample needed to detect a significant effect was 82 participants for the correlational test, 130 participants for the *t*-tests, and 159 for the ANOVA. Bootstrapping techniques were also used in analysing the data, an iterative mathematical process for estimating a normal distribution from a sample thereby potentially improving the accuracy of a statistical technique. Field (2013) indicated that bootstrapping is a robust method for further reducing bias. Despite the presence of skewness in the RIPLS and ISVS-24, the *t*-test and analysis of variance (ANOVA) were used because both statistical analyses have been found to be robust when populations are abnormally distributed and large differences in variances are present (Aron et al., 2009). The overall RIPLS and ISVS-24 were used in this study. Although reliability coefficients for subscales of the ISVS-24 are satisfactory, well documented problems exist within the subscales of the RIPLS (Kerry et al., 2018; King et al., 2012; McFadyen et al., 2005).

## 4. Results

### 4.1. Participant characteristics

The total sample population was 103 students, which consisted of 85 % females ($n = 88$) and 15 % males ($n = 15$). The participants ranged in ages from 18 to 54 years ($M = 30.29$; $SD = 10.25$). Approximately 58 % of the respondents were married ($n = 42$) or in a partnership ($n = 18$) and 42 % were single ($n = 36$) or divorced ($n = 7$). In the sample, 58 students were enrolled for on-campus learning and 45 students were studying externally. Proportionally more students were in the first year of nursing study ($n = 48$), followed by second ($n = 34$) and then third year ($n = 21$) students. Fifty-three respondents had previously worked in the health industry, compared to 50 students who had no prior healthcare experience. One hundred participants did not identify as Aboriginal, or Torres Strait Islander and three students identified as being Aboriginal. Approximately 79 % ($n = 81$) respondents were Australian or New Zealand residents and 12 % of the respondents ($n = 22$) were not Australian or New Zealand citizens and/or permanent residents.

### 4.2. Descriptive data and reliability of study measures

The means, standard deviations, and Cronbach alphas for the RIPLS and ISVS-24 are represented in Table 1.

**Table 1**

Means, standard deviations and Cronbach's alpha coefficients for the Readiness For Interprofessional Learning Scale and Interprofessional Socialisation and Valuing Scale.

| Measure | M | SD | $\alpha$ | Range | |
| --- | --- | --- | --- | --- | --- |
| | | | | Possible | Observed |
| RIPLS | 4.15 | 0.82 | 0.85 | 1.00–5.00 | 3.78–4.85 |
| ISVS | 6.20 | 1.38 | 0.99 | 1.67–7.96 | 5.46–7.25 |

*Note.* RIPLS = Readiness for Interprofessional Learning Scale; ISVS = Interprofessional Socialisation and Valuing Scale.

### 4.3. Relationship between readiness for IPE and interprofessional socialisation

To address the first research question, a Pearson product-moment correlation coefficient was computed to assess the relationship between readiness for interprofessional learning and interprofessional socialisation, to determine if there was a statistically significant correlation. There was no correlation found between the two variables ($r = 0.063$, $n = 103$, $p = .524$).

### 4.4. Readiness for interprofessional learning and socialisation, and the influence of study mode and healthcare experience

To address the research questions related to whether there were differences between students in terms study mode, and prior healthcare experience, and students' readiness for interprofessional learning and socialisation, several *t*-tests were performed.

Firstly, an independent-samples *t*-test was conducted to compare readiness for interprofessional learning in participants studying nursing internally and students learning externally. There was no significant difference in the scores for on-campus ($M = 4.25$, $SD = 0.75$) and external modes of study ($M = 4.01$, $SD = 0.88$); $t(101) = 1.55$, $p = .125$.

Secondly, an independent-samples *t*-test was used to compare nursing students' interprofessional socialisation skills in on-campus and external modes of study. There was no significant difference in the scores for participants studying on-campus ($M = 6.02$, $SD = 1.41$) and respondents studying externally ($M = 6.42$, $SD = 1.32$); $t(101) = -1.46$, $p = .148$. These results indicate that there is no difference between on-campus and external modes of study regarding a readiness for interprofessional learning and socialisation skills.

Thirdly, an independent-samples *t*-test was conducted to compare readiness for interprofessional learning in students with previous healthcare experience and students with no previous healthcare experience. There was no significant difference in the scores for students with prior healthcare experience ($M = 4.10$, $SD = 0.88$) and students with no healthcare experience ($M = 4.18$, $SD = 0.76$); $t(101) = -0.49$, $p = .623$.

Fourthly, an independent-samples *t*-test was conducted to compare interprofessional socialisation in students with previous healthcare experience and students with no previous healthcare experience. Participants with previous healthcare experience had significantly higher scores for interprofessional socialisation ($M = 6.57$, $SD = 1.12$) than those with no previous healthcare experience ($M = 5.85$, $SD = 1.51$), $t(96) = 2.75$, $p = .007$. These results represented a medium effect size, $d = 0.53$.

### 4.5. The influence of year level on readiness for interprofessional learning and socialisation

The final research question was aimed at determining whether a student's year of study, increased readiness for interprofessional learning and socialisation. Firstly, A one-way between subjects ANOVA was conducted to compare the effect of year level on readiness for interprofessional learning in first year, second year, and third year conditions. There were no significant effects for year level on readiness

learning at the $p < .5$ level for the three conditions [F(2,100) = 2.60, $p$ = .133]. The means, standard deviations and significance for year level conditions are represented in Table 2.

Next, a one-way between subjects ANOVA was also performed to compare the effect of year level on interprofessional socialisation skills in first year, second year, and third year conditions. There was a significant effect of year level on interprofessional socialisation at the $p < .5$ level for the three conditions [$F(2, 100) = 3.12$, $p = .049$, $\eta p^2 = 0.059$]. Post-hoc analyses using Tukey's HSD (Honest Significance Difference) test indicated that the mean score for year one was significantly lower than year three. However, year two did not significantly differ from year one and year three. Table 3 presents the means, standard deviations and significance for year level conditions relating to interprofessional socialisation.

## 5. Discussion

This research examined undergraduate nursing students' readiness for interprofessional learning and interprofessional socialisation. In this study, results indicated a non-significant relationship between readiness for interprofessional learning and the following variables: mode of study, year level, and prior healthcare experience. Non-significant relationships were also found for interprofessional socialisation and mode of study. Significant differences were noted between interprofessional socialisation and year level and interprofessional socialisation and prior healthcare experience.

With respect to the fact that no significant correlation was found between readiness for interprofessional learning and interprofessional socialisation, this may be due to the measures themselves, which are typically used longitudinally using pre and post interventions. Although the scales measure willingness to engage in IPE at a point in time, a longitudinal study may have better explained the relationship between both measures. Students tend to learn progressively over time and after socialisation experiences, such as clinical placements.

To the author's knowledge no academic scholarship has measured the relationship between interprofessional readiness and interprofessional socialisation. It was expected that an association would exist between the two scales and one scale could predict positive outcomes in the other scale. The Readiness for Interprofessional Learning Scale has been used extensively within IPE literature; however, multiple studies confirm low internal consistencies (0.43 and below) for the roles and responsibilities subscale (King et al., 2012; McFadyen et al., 2005). Several researchers have recommended further refinement of the scale (Kerry et al., 2018; Oates and Davidson, 2015). It would be worthwhile to perform a confirmatory factor analysis on the scale. This would allow further testing of the structure and relationship between underlying latent factors (Field, 2013).

The results suggest that there was no difference in student readiness for interprofessional learning between both modes of study. A statistically significant difference between mode of study and interprofessional socialisation was also examined. The results indicate that there was no difference in student interprofessional socialisation between on-campus and external modes of study.

Previous research specifically examining mode of study using the

**Table 2**
Year level mean scores, standard deviations, and significance for the Readiness for Interprofessional Learning Scale.

| Year level | *M* | *SD* | Sig. |
| --- | --- | --- | --- |
| First year | 4.32 | 0.68 | – |
| Second year | 4.03 | 0.95 | – |
| Third year | 3.95 | 0.82 | – |
| Total | 4.15 | 0.82 | 0.133 (NS) |

*Note.* M = mean; SD = standard deviation; Sig. = Significance at the 0.05 level; S = significant; NS = not significant.

**Table 3**
Year level mean scores, standard deviations, and Significance for the Interprofessional Socialisation and Valuing Scale.

| Year level | *M* | *SD* | Year level comparison | Sig. |
| --- | --- | --- | --- | --- |
| First year | 5.88 | 1.50 | 1–2 | 0.303 (NS) |
| | | | 1–3 | 0.047 (S) |
| Second year | 6.32 | 1.30 | 2–1 | 0.303 (NS) |
| | | | 2–3 | 0.536 (NS) |
| Third year | 6.72 | 1.00 | 3–1 | 0.047 (S) |
| | | | 3–2 | 0.536 (NS) |
| Total | 6.20 | 1.38 | – | 0.049 (S) |

*Note.* M = mean; SD = standard deviation; Sig. = Significance at the 0.05 level; S = significant; NS = not significant.

Readiness for Interprofessional Learning Scale and Interprofessional Socialisation and Valuing Scale could not be found; however, other IPE research has revealed positive student outcomes using both online and on-campus methods of learning (Riesen et al., 2012; Solomon et al., 2010). Djukic et al. (2015) compared online learning and blended-learning interventions. The authors found no significant differences in IPE outcomes between both groups, except for medical students' attitudes relating to team worth (Djukic et al., 2015).

As authors in this current study, we found that no difference between year level and/or prior healthcare experience in relation to student readiness for interprofessional learning. Axelsson et al. (2019) also found no difference in readiness for shared learning between Swedish nursing students with prior healthcare experience and those without any healthcare experience. The outcomes in the current study are contradictory to previous research that found that readiness for IPE was significantly affected by previous work history within healthcare settings (Hood et al., 2014; Huebner et al., 2021; Judge et al., 2015) and duration of study (Al-Qahtani, 2016; Axelsson et al., 2019). Several studies examined interprofessional learning with undergraduate students from multiple health disciplines (Al-Qahtani, 2016; Hood et al., 2014; Judge et al., 2015). A wider sample of students may explain the differences between the results from this current study and other studies.

Students with prior healthcare experience exhibited greater levels of interprofessional socialisation, demonstrating a medium-sized effect. Additionally, year level had an effect on interprofessional socialisation skills. Specifically, the results suggest a significant difference between first and third-year nursing students. Third year students display higher levels of interprofessional socialisation than first year nursing students. It is important to note that a non-significant effect was observed between interprofessional socialisation and students in their second year of nursing studies.

To the authors knowledge, there is no prior research that specifically examines the differences in interprofessional socialisation in terms of duration of study and/or previous healthcare experience. The research demonstrates that IPE simulations (Wietholter et al., 2017), clinical placements (O'Brien et al., 2013; Stubbs et al., 2017), and IPE workshops (Stubbs et al., 2017) are effective approaches that improve interprofessional socialisation skills among students in university settings. Given that professional identity is enhanced as students interact with educational facilities and professional workplaces (Arndt et al., 2009), students with healthcare experience and/or advanced educational knowledge may have had more opportunities to develop professional and interprofessional identities and socialisation skills.

Nursing students in their third year of study have completed more clinical placements in comparison to first year students. Although there was not a significant difference between 1st and 2nd year, the mean was higher for 2nd year students. This indicates that as nursing students advance through their study, they may experience interprofessional education opportunities that influence their perceived socialisation skills. Longitudinal research would need to be performed to verify this assertion. These results provide a greater understanding into two factors (study duration and previous healthcare experience) that enhance the

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