

EDUCATIONAL ADVANCES IN EMERGENCY MEDICINE

Open Access



A novel nurse-inteRN mentorship program to improve nurse-physician communication and teamwork in the emergency department

Amanda Doodlesack^{1*}, Nicole Dubosh¹, Anne Grossestreuer¹, Lorian de Oliveira² and Leslie Bilello¹

Abstract

Background Communication between nurses and physicians is essential to providing patient care in the emergency department. The American College of Graduate Medical Education includes interpersonal and communication skills as one of six core competencies for residents. There is a known correlation between poor communication and negative patient outcomes. Yet, formalized training programs in doctor-nurse communication are lacking and literature reports that physicians may view collaboration as less important than nurses. To address this gap, we developed and implemented a novel, pilot “Nurse-InteRN Mentorship Program”. The program aimed to improve trainees’ communication with nurses and enhance emergency department collaboration. We then evaluated the impact of this program on participant perception of nurse-physician communication, efficacy and overall benefit.

Methods We used Kern’s Six-step approach to develop and implement this program. We then evaluated the program’s impact with a pre-program and post-program 12-question survey to evaluate participation, perceived benefit, and efficacy of the program using a 1–5 Likert scale. Nurse vs. intern responses were compared using Fisher’s exact and Wilcoxon rank sum tests. Pre- and post- intervention responses were paired by respondent and compared using marginal homogeneity tests.

Results 13 interns and 22 nurses participated in the program. All 13 interns and 19 of 22 nurses completed the pre-program survey. 10 of 13 interns and 11 of 22 nurse mentors completed the post-program survey. Nurses showed greater interest in providing feedback on communication skills than interns showed in receiving feedback ($p < 0.001$). Interns rated themselves higher in communication skills with patients than nurses rated them ($p = 0.004$). Perceived benefit among nurses and interns decreased after completion of the program.

Conclusion We were able to successfully implement a one-year nurse-intern mentorship program aiming to promote communication, collaboration and professional development. Our results show differing attitudes between nurses and interns around interns’ communication skills. There was some perceived benefit, but unfortunately this decreased over the course of the program. Further studies are needed to determine how this program impacts communication, teamwork, and patient care. We hope that given the novelty of such a nurse-intern mentorship program, this study may serve as a pilot for future programs.

*Correspondence:
Amanda Doodlesack
adoodles@bidmc.harvard.edu

Full list of author information is available at the end of the article



© The Author(s) 2024. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article’s Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article’s Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

Keywords Communication, Education, Interdisciplinary, Collaboration, Mentorship

Introduction

Providing excellent care in the high acuity emergency department requires trust and communication between nurses and physicians. There is a known correlation between poor communication and negative patient outcomes. In the Joint Commission's 2022 report, miscommunication was the leading factor contributing to sentinel events [1]. Errors arising from miscommunication led to 210,000–440,000 US patient deaths in 2013 and are the second leading root cause of diagnostic errors in the emergency department (ED) [2, 3]. In addition, poor communication has been linked to decreased job satisfaction and burnout, further highlighting its importance in clinical medicine [4, 5].

The American College of Graduate Medical Education (ACGME) includes interpersonal and communication skills as one of six core competencies for residents. Formalized training programs for nurse-physician communication are lacking. A recent review found only four interventional studies that involved the implementation of educational programs to improve nurse-physician communication, most of which were initiated by nurses [6]. Two of these studies showed improved collaboration [7, 8]. Additionally, other investigations reported that physicians viewed collaboration as less important than nurses [9–11].

To address this gap, we created a novel, pilot Nurse-InterN Mentorship program in our ED. The objectives of the program were to improve trainees' communication and enhance collaboration with the ultimate goal of improving patient care. We evaluated the impact of this program on participant perception of communication skills, collaboration and perceived benefit.

Methods

We developed and implemented a novel, pilot year-long multidisciplinary "Nurse-InterN Mentorship Program" at a large urban academic medical center, home to a three-year emergency medicine residency. We used Kern's six-step approach as a conceptual framework for developing, implementing and evaluating our program [12] [Figure 1].

We performed a literature review and discovered few publications on nurse-mentorship programs. Prior communication initiatives include interdisciplinary simulation and clinical rounds, communication curriculum and shadowing programs, all of which were perceived as beneficial [6]. We did not find reports of a mentorship program involving nurse mentors and intern mentees and no program has been described in emergency medicine. We also conducted a targeted needs assessment in

our ED through discussions with nursing and residency leadership, residents and nurses. Initial feedback from all parties was that this program could be feasible and beneficial.

Participants in the program included all 13 emergency medicine interns and 22 nurse mentors. Participation was required of interns and voluntary among nurses and was only open to full-time nurses to guarantee enough overlap working together with their intern mentees. Interns were the target subjects as developing interprofessional communication skills early was thought to be an effective way of improving communication long-term. The pilot program spanned one academic year, July 2020 to June 2021. We introduced the program during orientation and assigned mentor-mentee pairings. All 13 interns were assigned one or two nurse mentors based on the number of nurses who volunteered to participate. Pairs were expected to meet at least quarterly in person or virtually. Nurses were expected to provide feedback on communication and teamwork skills. Beyond regularly scheduled meetings, pairs were expected to communicate via text, phone, or method of their choice. We also held several group social events at local restaurants. The ultimate objectives of the program were to improve intern communication and teamwork skills, enhance departmental collaboration and ultimately improve patient care.

To assess the program, we developed a 12-question survey to evaluate participation, perceived benefit, and efficacy of the program based on best practices in educational research. Items included demographic information, interns' performance in communication and teamwork, and perceived benefit of the program using a 1–5 Likert scale [Appendix] [13]. The survey was field tested by several education faculty and modified based on feedback. Institutional Review Board exemption was obtained. We administered the survey using Qualtrics, an online data collection platform, and distributed it via email including an anonymous link. The initial survey was administered at the beginning of the academic year prior to program participation. The follow-up survey asked the same questions at the end of the year after program completion.

Descriptive statistics were used to characterize the study population. Continuous data were reported as medians with interquartile ranges (IQR)s and categorical data was reported as counts with frequencies. Between-group comparisons were made using Fisher's exact test for categorical or dichotomous data and Wilcoxon rank sum test for continuous data. In order to test the impact of the intervention, responses were paired by respondent and median scores were compared using marginal

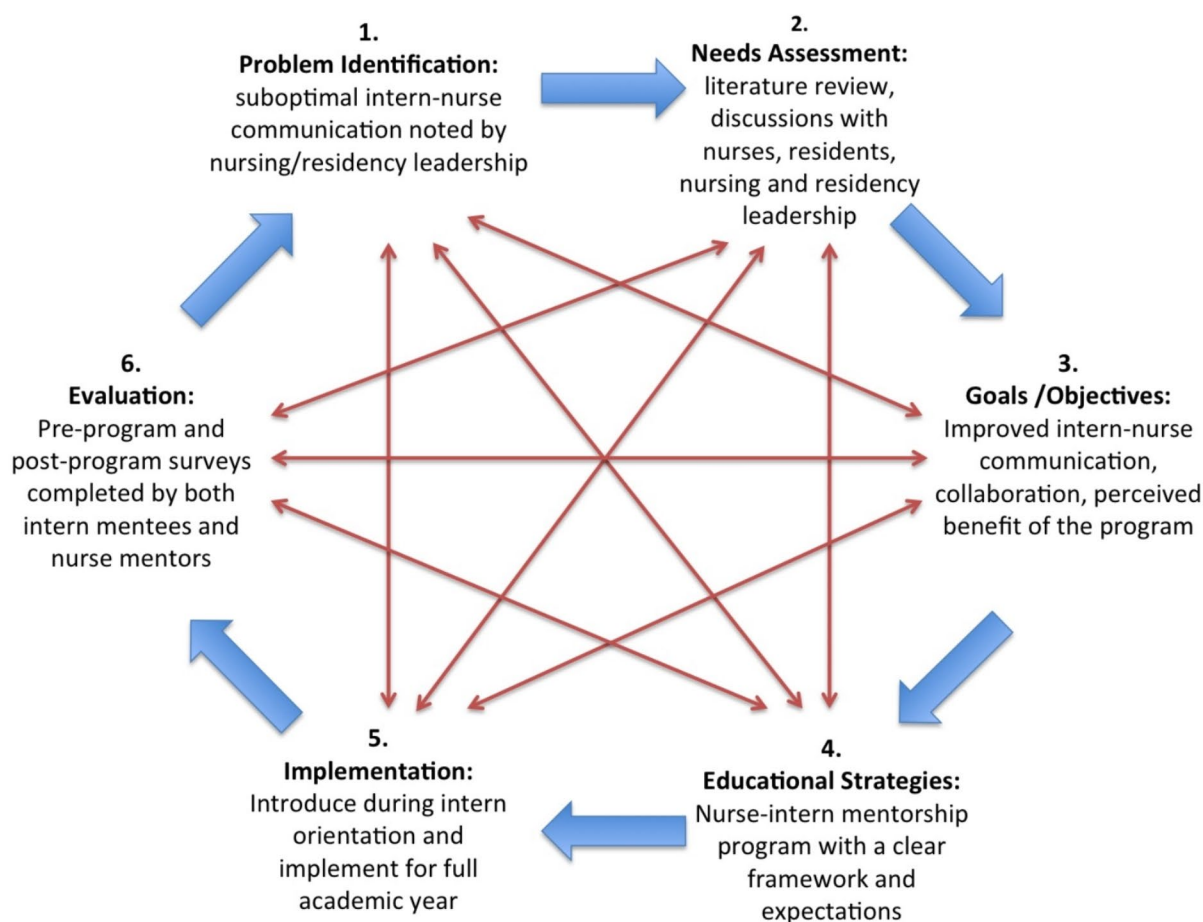


Fig. 1 Kern's six step approach as applied to our novel nurse-intern mentorship program

homogeneity tests. These analyses were stratified by intern vs. nurse. Analyses were performed using Stata 17.

Results

All 13 interns and 19 of 22 nurses (86%) completed the pre-program survey. Both groups preferred a combination of text/email/phone to communicate and preferred communication between nurses and physicians as a topic of interest. Most nurses (63%) listed feedback on performance of communications skills as a topic of most interest compared to zero interns ($p < 0.001$). When asked "How comfortable are you interacting with nurses/interns?," more nurses than interns indicated a higher comfort level. When asked "How strong are interns' communication skills with patients?," interns rated themselves higher than nurses did ($p = 0.004$). Lastly, when asked "How often are you able to teach/share knowledge with nurses/interns?," nurses reported they are able to teach/share knowledge more often than interns ($p = 0.003$). Full results are shown in Table 1.

Eleven of 22 nurse mentors and 10 of 13 interns completed the follow-up survey. Post-program, there was a statistically significant decrease in nurses' and interns' ratings on its benefit (nurses $p = 0.016$, interns $p = 0.035$), with a larger decrease in perceived benefit among interns compared to nurses. There was no significant improvement in ratings of interns' communication and teamwork abilities.

Discussion

We successfully developed and implemented a novel, one-year pilot "Nurse-InteRN Mentorship Program." Interestingly, nurses anticipated the program to be more beneficial pre-program and found it to be more beneficial post-program compared to interns. This is consistent with previous studies showing that nurses place higher value on physician-nurse collaboration compared to physicians [6, 14]. It is also important to note the statistically significant increased number of nurses compared to interns who selected "feedback on intern communication" as a topic of interest. Reasons for this discordance

Table 1 Pre-program and Post-program Survey responses from nurse mentors and intern mentees**Part 1. Comparison of Nurses vs Interns Pre-Program Survey Responses**

	Nurses		Interns		p-value
		IQR or Frequency (95% CI)		IQR or Frequency (95% CI)	
Number of program participants	22	-	13	-	-
Number who completed survey	19	86% (65–97%)	13	100% (75–100%)	0.164
Median age (years)	28	25, 33	29	27, 31	0.549
Female gender	17	89% (67–99%)	4	31% (9–61%)	0.002
Number of years working as a nurse/ MD					0.002
0–4	9	47% (24–71%)	13	100% (75–100%)	
5–9	9	47% (24–71%)	0	0% (0–25%)	
10–19	1	5% (0–26%)	0	0% (0–25%)	
20+	0	0% (0–18%)	0	0% (0–25%)	
How beneficial will the program be? (median score)	4	4, 5	4	3, 4	0.102
How often would you want to meet?					0.185
<3 times per year	2	11% (1–33)	1	8% (0–36%)	
quarterly	9	47% (24–71)	11	85% (55–98%)	
monthly	5	26% (9–51%)	1	8% (0–36%)	
More than once per month	3	16% (3–40%)	0	0% (0–25%)	
How would you prefer to communicate?					0.832
Email	1	5% (0–26%)	0	0% (0–25%)	
Text	7	37% (16–62%)	4	31% (9–61%)	
Phone	0	0% (0–18%)	0	0% (0–25%)	
Combination of text/email/phone	11	58% (33–80%)	9	69% (39–91%)	
What topics are you most interested in discussing?					
Communication between MDs and RNs	19	100% (82–100%)	11	85% (55–98%)	0.157
Communication with patients	13	68% (43–87%)	9	69% (39–91%)	> 0.999
Clinical knowledge	8	42% (20–67%)	3	23% (5–54%)	0.450
Clinical/procedural skills	13	68% (43–87%)	5	38% (14–68%)	0.149
Life/interests/wellness	12	63% (38–84%)	10	77% (46–95%)	0.467
Feedback on communication performance	12	63% (38–84%)	0	0% (0–25%)	< 0.001

Table 1 (continued)

How comfortable are you interacting with nurses/interns?					0.139
Very uncomfortable	0	0% (0–18%)	0	0% (0–25%)	
Slightly Uncomfortable	0	0% (0–18%)	1	8% (0–36%)	
Neither uncomfortable nor comfortable	3	16% (0–18%)	1	8% (0–36%)	
Somewhat comfortable	6	32% (13–57%)	8	62% (32–86%)	
Very comfortable	10	53% (29–76%)	3	23% (5–54%)	
How strong do you feel interns' ability to work as a team with nursing is?					0.158
Very weak	0	0% (0–18%)	0	0% (0–25%)	
Weak	0	0% (0–18%)	1	8% (0–36%)	
Neither strong nor weak	10	53% (29–76%)	4	31% (9–61%)	
Strong	8	42% (20–67%)	6	46% (19–75%)	
Very strong	0	0% (0–18%)	2	15% (2–45%)	
No response	1		0		
How strong are interns' communication skills with patients?					0.004
Very weak	0	0% (0–18%)	0	0% (0–25%)	
Weak	0	0% (0–18%)	0	0% (0–25%)	
Neither strong nor weak	12	63% (38–84%)	2	15% (2–45%)	
Strong	7	37% (16–62%)	7	54% (25–81%)	
Very strong	0	0% (0–18%)	4	31% (9–61%)	
How often are you able to teach/share knowledge with nurses/interns?					0.003
Never	0	0% (0–18%)	1	8% (0–36%)	
Rarely (a few times per year)	2	11% (1–33%)	4	31% (9–61%)	
Sometimes (about once per month)	4	21% (6–46%)	6	46% (19–75%)	
Often (about once per week)	13	68% (43–87%)	1	8% (0–36%)	
All the time (about every shift)	0	0% (0–18%)	1	8% (0–36%)	

Part 2. Pre-program vs post-program survey results**Nurses**

	Pre-program(<i>n</i> = 11)	Post-program(<i>n</i> = 11)	<i>p</i> -value	Subjects with only one assessment (<i>n</i> = 9)
Median score for how beneficial this program will be	5 (4, 5)	4 (3, 4)	0.016	4 (3, 5)

Table 1 (continued)

How comfortable are you interacting with nurses/interns?			0.189	
Very uncomfortable	0 (0%)	0 (0%)		0 (0%)
Slightly comfortable	0 (0%)	0 (0%)		0 (0%)
Neither uncomfortable nor comfortable	2 (18%)	1 (9%)		1 (11%)
Somewhat comfortable	2 (18%)	5 (45%)		4 (44%)
Very comfortable	7 (64%)	5 (45%)		4 (44%)
How strong do you feel interns' ability to work as a team with nursing is?			0.368	
Very weak	0 (0%)	0 (0%)		0 (0%)*
Weak	0 (0%)	0 (0%)		0 (0%)
Neither strong nor weak	5 (45%)	4 (36%)		5 (55%)
Strong	6 (55%)	5 (45%)		3 (33%)
Very strong	0 (0%)	2 (18%)		0 (0%)
How strong are interns' communication skills with patients?			0.262	
Very weak	0 (0%)	0 (0%)		0 (0%)*
Weak	0 (0%)	1 (9%)		0 (0%)
Neither strong nor weak	8 (73%)	4 (36%)		4 (44%)
Strong	3 (27%)	5 (45%)		4 (44%)
Very strong	0 (0%)	1 (9%)		0 (0%)
How often are you able to teach/share knowledge with nurses/interns?			0.392	
Never	0 (0%)	0 (0%)		0 (0%)
Rarely (a few times per year)	1 (9%)	0 (0%)		1 (11%)
Sometimes (about once per month)	2 (18%)	5 (45%)		2 (22%)
Often (about once per week)	8 (73%)	5 (45%)		6 (67%)
All the time (about every shift)	0 (0%)	1 (9%)		0 (0%)
Interns	Pre (n = 10)	Post (n = 10)	p-value	Subjects with one assessment (n = 3)
Median score for how beneficial this program will be	4 (3, 5)	2.5 (2, 3)	0.035	3 (3, 4)
How comfortable are you interacting with nurses/interns?			0.801	
Very uncomfortable	0 (0%)	0 (0%)		0 (0%)
Slightly comfortable	1 (10%)	1 (10%)		0 (0%)
Neither uncomfortable nor comfortable	1 (20%)	1 (20%)		0 (0%)
Somewhat comfortable	6 (60%)	4 (40%)		2 (67%)
Very comfortable	2 (20%)	4 (40%)		1 (33%)
How strong do you feel interns' ability to work as a team with nursing is?			0.414	
Very weak	0 (0%)	0 (0%)		0 (0%)
Weak	1 (10%)	0 (0%)		0 (0%)
Neither strong nor weak	4 (40%)	1 (10%)		0 (0%)
Strong	4 (40%)	7 (70%)		2 (67%)
Very strong	1 (10%)	2 (20%)		1 (33%)
How strong are interns' communication skills with patients			0.819	
Very weak	0 (0%)	0 (0%)		0 (0%)
Weak	0 (0%)	0 (0%)		0 (0%)
Neither strong nor weak	1 (10%)	2 (20%)		1 (33%)
Strong	7 (70%)	6 (60%)		0 (0%)
Very strong	2 (20%)	2 (20%)		2 (67%)

Table 1 (continued)

How often are you able to teach/share knowledge with nurses/interns?		0.231	
Never	1 (10%)	0 (0%)	0 (0%)
Rarely (a few times per year)	3 (30%)	0 (0%)	1 (33%)
Sometimes (about once per month)	4 (40%)	7 (70%)	2 (67%)
Often (about once per week)	1 (10%)	3 (30%)	0 (0%)
All the time (about every shift)	1 (10%)	0 (00%)	0 (0%)

*1 subject (11%) with missing data

are unclear. Power dynamics, preassigned designation of mentor/mentee and prior experience may play a role. Different models of education may also account for this. Nurse training often emphasizes a narrative style of communication to relay information to physicians throughout the course of patient care to facilitate shared decision-making. Physician training emphasizes organized, succinct communication and focuses on development of technical skills, diagnosis and treatment [9, 15, 16]. Further investigation is warranted to explore this and other differing perspectives. Unfortunately, both groups found the program to be less beneficial after completion than anticipated. This may be due to inadequate structure, unclear expectations, nursing turnover, or increased burnout amidst the pandemic leading to decreased engagement [17]. Lastly, this pilot program was designed to be flexible, with participants meeting via varying platforms and frequencies. This does introduce several confounding factors that may have impacted results.

There are several limitations to this study. First, this was a single center pilot study conducted over one year with a small sample size of 13 interns and 22 nurses. Some interns had two mentors rather than one. This may have affected perceived impact of the program. Additionally, while the pre-program survey response rate was high, several participants, mostly nurses, were lost to follow-up. Most nurses were female, whereas interns included four female and nine males meaning gender discordance in several mentor/mentee pairs. This may have had an impact due to personal relationships, affection or conflict. A major limiting factor was the Covid-19 pandemic. This led to decreased opportunities for in-person meetings, nursing turnover, and difficulty for nurses and interns to get to know each other longitudinally, as well as a decreased post-program survey response rate due to turnover. Lastly, there are many confounding factors over the course of intern year that may also impact interns' communication and collaboration skills making it difficult to determine how much impact is attributable to the intervention itself.

To improve upon this program for future years, we plan to increase structure with clear expectations of nurse-intern pairs. Survey feedback indicates quarterly meetings are most desired and feasible. We will have each pair

meet quarterly and send reminder emails with outlined discussion topics for these meetings. We will make clear that feedback will be given to all involved parties in order to improve communication and help overcome the difference in attitudes we found. Lastly, given nurse turnover was a considerable limitation to our pilot program, we will select nurse mentors with longstanding history at the hospital at lower risk for leaving and implement a protocol to pair interns with a new mentor if their mentor leaves.

Conclusion

We were able to successfully implement a one-year nurse-intern mentorship program to promote mentorship, professional development and collaboration. Results showed a decrease in perceived benefit among nurses and interns after completion of the program. While this is unfortunate, results did show an interesting difference in attitudes around communication between nurses and interns and evidence that nurses are interested in providing feedback on communication to interns. This indicates that improving this intervention for future implementation may have benefit for enhancing the physician-nurse relationship. We plan for systematic improvement to the program based on initial feedback. Further studies are needed to determine how such a program impacts communication and teamwork skills or if there is any impact on patient care. We hope that given the novelty of such a nurse-intern mentorship program, this study may serve as a pilot for future programs.

Appendix: pre- and post-program survey questions

1. Age.
2. Gender.
3. How many years of prior experience do you have working as an RN (nurses)? –OR– in a clinical setting (EMT, scribe, CAN, etc.)? ***do not include nursing/medical school** (interns).
- 0.
- 1.
- 2.
- 3+.

4. (interns only) If you worked in a clinical role previously, what did you do for work?
5. How beneficial do you think a nurse/intern mentorship program will be to improving teamwork, communication, and camaraderie and knowledge in the emergency department?

Not at all beneficial.
Slightly beneficial.
Moderately beneficial.
Very beneficial.
Extremely beneficial.

6. How often would you be interested in meeting with your mentor/mentee during the 2020–2021 academic year?

a. fewer than 3 times.
b. quarterly.
c. monthly.
d. more than once per month.

7. How would you like to communicate primarily with your nurse mentor/intern mentee outside of meeting in person (or via zoom)?

a. email.
b. text.
c. phone.
d. combination of all of the above.

8. What topics would you like to discuss with your nurse mentor/intern mentee? (select all that apply)

a. communication between MDs and RNs.
b. feedback on performance.
c. clinical knowledge.
d. clinical skills/procedural skills.
e. life/interests/wellness.

9. How comfortable do you feel interacting with nurses/interns?

1. very uncomfortable.
2. slightly uncomfortable.
3. neither uncomfortable nor comfortable.
4. somewhat comfortable.
5. very comfortable.

10. How strong do you feel your ability to work as a team with nurses/interns is?

1. very weak.
2. weak.

3. neither strong nor weak.
4. strong.
5. very strong.

11. How strong do you feel interns' communication skills with patients are?

1. very weak.
2. weak.
3. neither strong nor weak.
4. strong.
5. very strong.

12. How often are you able to teach/share knowledge with nurses/interns?

1. never.
2. rarely (a few times a year).
3. sometimes (about once per month).
4. often (about once per week).
5. all the time (about every shift).

Acknowledgements

Not applicable.

Author contributions

AD as first author assisted with development of the mentorship program, designed the survey, collected and analyzed the data, and took point on the writing of the manuscript. ND was involved with the needs assessment, guided the development of the mentorship program, guided the survey design and edited the paper. AG performed all statistical analyses. LO was involved with the needs assessment, assisted with development of the mentorship program, was responsible for recruitment of nurse mentors and communication with nursing throughout the project. LB as senior author was involved with the needs assessment, guided the development of the mentorship project, assisted with survey design and edited the manuscript. All authors reviewed the manuscript.

Funding

No funding was received in support of this project.

Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethical approval and consent to participate

This project was granted an exemption through the Beth Israel Deaconess Medical Center Institutional Review Board, protocol #: 2020P000608. Participation was completely anonymous and voluntary among all participants.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

¹Dept. of Emergency Medicine, Harvard Medical School, Beth Israel Deaconess Medical Center Harvard Affiliated Emergency Medicine Residency, One Deaconess Road, W/CC2, Boston, MA 02215, USA

²Lahey Medical Center, Burlington, MA, USA

Received: 7 March 2024 / Accepted: 28 September 2024

Published online: 23 October 2024

References

1. The Joint Commission. Sentinel Event Data 2022 Annual Review The Joint Commission [Internet]. 2023. [https://www.jointcommission.org/-/media/tjc/documents/resources/patient-safety-topics/sentinel-event/03162023_sentinel-event_annual-review_final-\(002\).pdf](https://www.jointcommission.org/-/media/tjc/documents/resources/patient-safety-topics/sentinel-event/03162023_sentinel-event_annual-review_final-(002).pdf)
2. Ellison D. Communication skills. *Nurs Clin North Am*. 2015;50(1):45–57.
3. Newman-Toker DE. Diagnostic Errors in the Emergency Department. 2022.
4. O'Daniel M, Rosenstein AH. Professional Communication and Team Collaboration [Internet]. Hughes RG, editor. PubMed. Rockville (MD): Agency for Healthcare Research and Quality (US); 2008. <https://pubmed.ncbi.nlm.nih.gov/21328739>
5. Seago JA. Professional Communication [Internet]. Hughes RG, editor. PubMed. Rockville (MD): Agency for Healthcare Research and Quality (US); 2008. <https://www.ncbi.nlm.nih.gov/books/NBK2679>
6. Tang CJ, Chan SW, Zhou WT, Liaw SY. Collaboration between hospital physicians and nurses: an integrated literature review. *Int Nurs Rev*. 2013;60(3):291–302.
7. Burns K. Nurse-physician rounds: a collaborative approach to improving communication, efficiencies, and perception of care. *Medsurg Nurs*. 2011;20(4):194–9.
8. McCaffrey RG, Hayes R, Stuart W, Cassell A, Farrell C, Miller-Reyes C, et al. A program to improve communication and collaboration between nurses and medical residents. *J Contin Educ Nurs*. 2010;41(4):172–8.
9. Hughes B, Fitzpatrick JJ. Nurse-physician collaboration in an acute care community hospital. *J Interprof Care*. 2010;24(6):625–32.
10. Garber JS, Madigan EA, Click ER, Fitzpatrick JJ. Attitudes towards collaboration and servant leadership among nurses, physicians and residents. *J Interprof Care*. 2009;23(4):331–40.
11. Rosenstein AH. Nurse-Physician relationships: impact on nurse satisfaction and Retention. *Am J Nurs*. 2002;102(6):26–34.
12. Thomas PA, Kern DE, Hughes MT, Tackett S, Chen BY. Curriculum development for medical education: a six-step approach. Baltimore: Johns Hopkins University; 2022.
13. Artino AR, La Rochelle JS, Dezee KJ, Gehlbach H. Developing questionnaires for educational research: AMEE Guide 87. *Med Teach*. 2014;36(6):463–74.
14. Thomson S. Nurse-physician collaboration: a comparison of the attitudes of nurses and physicians in the medical-surgical patient care setting. *Medsurg Nurs*. 2007;16(2):87–91.
15. Tan TC, Zhou H, Kelly M. Nurse-physician communication - an integrated review. *J Clin Nurs*. 2017;26(23–24):3974–89.
16. Sirota T. Nurse/physician relationships. *Nursing*. 2007;37(1):52–6.
17. Petrino R, Riesgo LGC, Yilmaz B. Burnout in emergency medicine professionals after 2 years of the COVID-19 pandemic: a threat to the healthcare system? *Eur J Emerg Med*. 2022;29(4):279–84.

Publisher's note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.