

Medical improvisation improves communication skills among healthcare professionals

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Effective communication is essential to sustain a thriving healthcare workforce and ensure patient health and safety (Howell et al., 2020; Kreitzer & Klatt, 2017). The importance of creating environments where members of the healthcare team can voice concerns about patient quality and safety and their own well-being is well documented (Ford et al., 2021); yet, approaches to building healthcare workers' communication skills are understudied and underutilized (Omura et al., 2017). Emerging research on communication training and anecdotal reports indicate that medical improvisation (improv) is a promising strategy to improve communication skills by increasing empathy, intent listening, and adjusting oneself to accommodate to the communication needs and values of the others (Fu, 2019; Mehta et al., 2020; Watson & Fu, 2016). The current study presents the application of a medical improv program, the Alda Medical Experience (AME) communication training workshop, among healthcare workers and the immediate outcomes of such training.

Healthcare interprofessional communication

Healthcare workers are one of the largest labor sectors in the U.S. and one that is most plagued by stress, diminished well-being, and burnout (Denning et al., 2021; Shanafelt et al., 2019). Burnout is generally defined as a

loss of enthusiasm for work, feelings of cynicism, a low sense of accomplishment, emotional exhaustion, and high depersonalization (Groves, 2018; Maslach & Jackson Susan, 1981). Literature suggests there is a rising incidence of stress and burnout among physicians, nurses, and other health care professionals (Afonso et al., 2021; Aiken et al., 2002; Benson et al., 2016; Dyrbye & Shanafelt, 2016; Dyrbye et al., 2017) that is partially attributable to poor interprofessional communication (Vermeir et al., 2018). Burnout is recognized as not only an interpersonal experience but as one that is caused, shaped, and lived through communication (Tracy, 2010).

Interprofessional communication includes communication between different medical teams (e.g., surgeon-anesthesiologist, emergency department physician-cardiologist), different types of healthcare professionals (e.g., nurse-physician, physician-resident), and between health care professionals within the same discipline (Real & Buckner, 2014). Suboptimal interprofessional communication among healthcare workers results in decreased well-being, and also has major adverse downstream impacts on organizational culture and patient safety. For example, miscommunication when handing off a patient from one medical team to another can lead to adverse events (Mitchell et al., 2012). Moreover, existing hierarchies mute voices of

healthcare professionals, especially those who are lower in the hierarchy (i.e., nurses, trainees) making it difficult for some to ‘speak up’ (Kim et al., 2020; Krenz & Burtscher, 2020; Peadon et al., 2020) and making it difficult for others to ‘hear down’ those concerns (Peadon et al., 2020) – both contribute to an unsuitable safety climate and hostile or toxic work environments. The AME medical improv training which was developed at the Alda Center for Communicating Science® is specifically geared towards interprofessional communication among healthcare workers.

Medical improv

Communication centers comprised of diverse interdisciplinary teams have the opportunity to refine, rigorously evaluate, and disseminate communication training. The Alda Center for Communicating Science® is a provost-level cross-disciplinary center originally founded in 2009 within Stony Brook University’s School of Communication and Journalism. All of the Center’s workshops leverage the power of improvisational theater exercises to help scientists and healthcare professionals connect more authentically with audiences through listening and spontaneity. This training in particular focuses on communication between members of healthcare teams without patients, the “backstage” interactions described by Erving Goffman in *The Presentation of Self in Everyday Life* in 1959. This informal “backstage” communication can be crucial to building relationships and influencing collaboration (Ellingson, 2004). Throughout the experiential workshop, opportunities for participants to completely engage in “doing”— to experience ‘flow’ as participants “lose a sense of consciousness about their “selves” as

they meld with the activity” (May et al., 2004) -- are balanced with analytical opportunities to examine norms and personal communication defaults with a focus on applications to teamwork. Exercises invite creativity and flexibility as participants navigate performing their many roles through communication in a context outside of work.

Several reports have demonstrated the positive effects improv training has on confidence in communication and the specific ability to effectively deliver messages to colleagues and patients (Hammer et al., 2011; Mehta et al., 2020; Watson, 2011). However, less is known regarding the efficacy of this type of experiential communication training for multidisciplinary healthcare teams. Existing evaluations have focused on medical students and not on practicing healthcare professionals who need to communicate with each other in high stress and high-stakes environments (Eisenberg et al., 2005; Gao et al., 2019; Woo et al., 2020). Moreover, these evaluations have not assessed changes in specific communication skills- or their immediate consequences. Finally, there is a need to further understand the impact of individual-level outputs on subsequent training outcomes (Preis et al., 2021), and specifically the relationship between engagement or active participation in the training and expected changes in communication skills.

Aims

Assessment of Communication Center programs are needed to promote good practice and evaluate the effectiveness of training (Leek et al., 2015). The current study aims to expand our evidence-base about the effects of medical improv on

communication skills among healthcare workers. We conducted an immediate outcome evaluation that harnesses the expertise of communication researchers and trainers from the Alda Communication Center and medical researchers (Leek et al., 2015; Treise et al., 2016). We initially assessed the psychometrics of the instrument we developed to measure perceived interpersonal communication skills that captures the learning objectives of the training. We then assessed changes in the measured communication skills among interdisciplinary healthcare professionals following their participation in this one-time medical improv communication training. We hypothesized that communication skills would improve following the training, especially among those who reported being highly engaged in the training.

Materials and Methods

The training

In October 2020, 138 medical staff from the anesthesiology department of a large academic medical center participated in the AME training, a medical improv communication training workshop. The overarching goals of this experiential training are to improve communications skills among interprofessional healthcare teams, enhance team cohesion and safety culture and, subsequently, reduce downstream stress, improve job satisfaction, and improve patient outcomes. Drawing upon the fundamentals of improv combined with principles from adult learning theory, the two-hour training curriculum comprises scaffolded experiential exercises that focus on attunement (i.e. “knowledge of self and others”), affirmation (i.e. “validation of self and others”), and advancement (i.e. “enrichment of self and others”) (Fu, 2019). Exercises included in the

training such as “Yes, and” and “Make your partner look good” leverage the hierarchy of skill-building that exists with different improv exercises (Fu, 2019). The training begins with paired exercises followed by group exercises and, in very select cases, performance-oriented exercises. Each exercise is followed by a debrief about practical application in healthcare (Gao et al., 2019; Hoffmann-Longtin et al., 2018; Kaplan-Liss et al., 2018). The debrief follows the reflective model promoted by Rolfe et al. (2001); it begins with prompts to elicit observations on the experience, then moves to analyzing that experience, and ends with application prompts. All participants were instructed to actively take part in each of the exercises and facilitators ensured the rotation of different pairs, groups, and roles during each of the exercises. Participation in the training was mandatory and free; participants received Continuing Medical Education credits for attendance.

Notably, the training was designed and piloted by a multidisciplinary team of improvisational experts trained in the theater arts, social scientists, and clinician leaders from diverse healthcare professions (i.e., nursing, medicine, healthcare administration, medical research, and medical education). This innovative training required organizational buy-in and support not only from the leadership at the provost-level university center dedicated to communicating science but also from the Dean of the School of Medicine and leadership within the participating clinical department.

Measures

Participants completed a short survey before the training began (T1) and at the end of the training (T2) via links to online surveys or identical

hardcopies. Surveys did not contain individual identifiers. The study was reviewed and exempt by the Institutional Review Board of Stony Brook University on April 17, 2020 (Reference number 1572612-1). A waiver of consent from the university's Institutional Review Board was obtained for this anonymized, minimal risk study. T1 and T2 surveys were completed by 132 participants (96%).

We assessed background characteristics at T1, including sociodemographic questions (e.g., age, gender) and professional questions (e.g., medical credential, career level).

Perceived Interpersonal Communications Skills (hereafter Communication Skills) were measured at T1 and T2 using an eight-item scale developed by members of the Center's multidisciplinary research team. As shown in Table 1, the instrument was created to capture the learning objectives of medical improv communication training and assesses skill levels of active listening and connection to communicate clearly and empathically. Participants were asked to rate their skill level for each item (listed in Table 1) on a scale ranging from 1 = *Not skilled at all* to 5 = *Very skilled*. Overall Communication Skill scale scores were calculated as the mean of the eight items response (range 1-5).

Engagement was assessed at T2 using a Visual Analogue Scale. Participants were asked to indicate "How engaged you were in today's workshop" on a sliding scale from 0= not engaged to 100= fully engaged.

Statistical Analysis

Exploratory Factor Analysis (EFA) was conducted to assess the dimensionality of the Communication Skill scale. In EFA, components with an eigenvalue > 1 are to be considered as

possible factors explaining item variance. Cronbach's alpha for the entire scale and item-to-total correlations for each item were used to assess the internal consistency of the scale with alpha's > 0.7 considered indicators of good reliability. Pearson's correlation was used to measure the association between the pre-and post-communication skills assessments and dependent (paired) sample *t*-tests were used to examine inter-individual changes in each of the Communication Skills items and the overall Communication Skills scale. We conducted moderation analyses to assess the effects of Engagement on changes in Communication Skills. We examined differences in association between T1 and T2 Communication Skills items and the overall Communication Skill scale score for participants who reported low (-1 *SD*), average, and high (+1 *SD*) Engagement. We used PROCESS Macros to estimate and plot moderation effects of Engagements on changes in Communication Skills (Hayes, 2017).

Results

Slightly more than half of the participants identified as female, and the largest age group was 25-34 years of age. Over half of the participants were physicians and nearly one-fourth were advanced practice nurses. Participants reported high levels of Engagement in the training. Close to half of respondents ($n=53$, 46.1%) reported being highly engaged in the workshop (91-100); mean level of Engagement was 77.42 ± 27.21 .

EFA indicated that the Communication Skills scale was unidimensional-- it had a single factor that explained the variance in participants' responses to the eight items (Factor 1 eigen value > 4.5 ; Factor 2 eigen value < 0.95 at both T1

and T2). The single factor explained 57% and 61% of the variance in responses in T1 and T2 respectively. As shown in Table 1, at both time points, all items loaded strongly on the single factor. Each of the items were highly correlated with the overall scale score and the scale showed excellent internal consistency at both time points (Cronbach's alpha = 0.89 and 0.91 respectively).

As shown in Table 2, paired sample *t*-tests indicate that while on average, there was an improvement in the overall Communication Skills (as indicated by the significantly higher mean in T2 compared to T1), some specific skills were more susceptible to change than others. Participants rated themselves at T1 as the least proficient in introspective communication skills (item 8), listening (item 7) and non-verbal communication (items 2), and these skills were most affected by the training (Cohen's *d* 0.36-0.44). In contrast, participants rated themselves at T1 as most proficient in communication skills that involve intrapersonal interaction, remaining on task and adjusting to others and showed significant but modest change (items 3,5,6) or no change (item 1). Participants reported being mostly proficient at beginning a conversation with an open mind (item 4) at T1, a skill that improved further at T2, and was ranked the highest by most participants.

Moderation analyses indicated that there was an interaction between T1 Communication Skills and Engagement in predicting T2 Communication Skills. As shown in Figure 1, improvement in Communication Skills between T1 and T2 was observed among the 89 participants who reported average or above levels of Engagement ($t(88) = -4.05, p < 0.001$). In contrast, the 22

participants that reported lower Engagement ($-1 SD$) did not report a change in Communication Skills between T1 and T2 ($t(21) = -1.01, p = 0.28$). The same interaction pattern was observed in five out of the eight specific Communication Skills that were assessed (Table 2).

Discussion

The current evaluation, which focuses on the immediate outcomes of a one-time medical improv communication training workshop for multidisciplinary healthcare teams, suggests that interpersonal communication skills can be reliably measured and that this type of experiential training improves communication skills. Moreover, our hypothesis regarding the importance of engagement in the training was confirmed – the degree of improvement in communication skills was greater among those who were more engaged than those who were less engaged. At the individual-level, participants rated their pre-training communication skills at different levels, and not surprisingly, the skills that participants were least proficient in- such as introspection in relation to others and listening to the meaning and value of other- showed the greatest improvement post-training (as indicated by Cohen's *d*). While it is possible that some of the observed change in certain items is attributable to ceiling effects (i.e., participants were proficient prior to the training and there was minimal room for further improvement), our findings about the change in the specific skill 'beginning a conversation with an open mind' suggests otherwise since participants rated themselves as being highly open-minded pre-training yet they reported improvement in this area following the training nonetheless.

Similar to clinical skills, the success of improv training partially lies in the active participation and engagement of trainees because this is an experiential method (Preis et al., 2021). Our moderation analysis indicates that high levels of engagement led to more favorable outcomes compared to those that had low levels of engagement. The worst post-training communication skills were reported by those who reported low proficiency before the training and were not engaged during the training; in this same group, those who were engaged reported their post-training skills improved nearly to the levels of participants who were highly proficient pre-training.

The study's reliance on self-assessment, using an instrument that was not previously validated, make it possible that the completion of the communication skills scale before the workshop led to self-reflection, resulting in higher scores in the post-training assessment (Alzahrani et al., 2019). Independent assessments of communication are needed to confirm our findings and assess the intermediate and long-term impacts of the training. It would also be important to assess the effects of medical improv on different types of healthcare communication scenarios such as patient-provider communication, inter- vs. intra-professional, and role negotiations (Woo et al., 2020). Since we found that the immediate positive effects of the training are maximized by participants' engagement, future work focusing on ways to increase engagement in the training is worthwhile. In addition, research is needed to estimate effects of the training on organizational culture, including patient safety, and identifying the tipping point (i.e. threshold) in terms of the proportion of trained

healthcare professionals in the workforce needed to produce systemic change.

Conclusion

Medical improv is a feasible and promising approach to teaching communication skills in healthcare and has tremendous potential to decrease burnout and improve patient safety (Mitchell et al., 2012; Tracy, 2010). Training interdisciplinary healthcare teams to communicate effectively requires a culture shift to counteract deeply imbedded hierarchical communication norms (Foronda et al., 2016; Gillespie et al., 2010; Hopkins et al., 2018). Medical improv offers a way to catalyze that paradigm shift and enable healthcare workers to reflect on the ways they communicate and practice ways to connect, listen and be heard (Fu, 2019; Mehta et al., 2020; Watson & Fu, 2016). This type of experiential training is poised to engage interdisciplinary healthcare team members, making them more aware of their own communication skills and of other's communication needs efficiently and effectively. Communication centers are well positioned to propel professional development of students scientists and healthcare workers (LaGrone & Mills, 2020). For communication centers interested in working in the healthcare field, developing collaborative partnerships with leaders in academic medical centers is an effective strategy to advance this work. For healthcare leaders, partnering with communication centers offers the opportunity to create environments where communicating clearly and respectfully ameliorates occupational stress and burnout for practicing healthcare professionals and promotes an organizational culture of patient safety (Ford et al., 2021). Ultimately,

systematic change and culture shifts will not only support the next generation of healthcare professionals but can also provide safe, effective and compassionate health care.

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Table 1. Perceived interpersonal communication skill assessment

	Pre-training (T1)		Post-training (T2)	
	Factor loading	Item-to-total correlation	Factor loading	Item-to-total correlation
Please rate how skilled you are at[†]:				
1. Remaining present and on task despite communication mistakes	.63	.54	.70	.62
2. Using effective nonverbal communication to aide collaboration	.75	.66	.80	.72
3. Leading by following another person's cues to make appropriate adjustments to your own communication	.81	.74	.85	.79
4. Beginning a conversation with an open mind	.79	.71	.77	.69
5. Creating strategies for collaboration in a challenging interaction	.77	.68	.78	.70
6. Selecting appropriate language to move a conversation forward	.75	.65	.78	.70
7. Listening for underlying values that drive another person's anger	.73	.64	.75	.67
8. Identifying facets of yourself that can help you relate to others	.78	.69	.80	.73
	Cronbach's alpha = 0.89		Cronbach's alpha = 0.91	
	Explained variance = 57%		Explained variance = 61%	

[†]Responses were reported on a scale ranging from 1= Not skilled at all to 5= Very skilled.

Table 2. Changes in perceived interpersonal communication skills following AME training

	T1 <i>M±SD</i>	T2 <i>M±SD</i>	<i>r</i>	<i>t</i>	<i>d</i>	Interaction [†] <i>β</i>
Overall communication skills (total score)	3.64±0.58	3.86±0.60	.42***	-2.69***	0.37	-0.01*
1. Remaining present and on task despite communication mistakes	3.78±0.78	3.80±0.85	.32***	0.19	0.03	0.00
2. Using effective nonverbal communication to aide collaboration	3.56±0.84	3.86±0.82	.32***	-3.39***	0.36	-0.01*
3. Leading by following another person's cues to make appropriate adjustments to your own communication	3.70±0.79	3.89±0.76	.34***	-2.30***	0.25	-0.01*
4. Beginning a conversation with an open mind	3.75±0.75	3.95±0.78	.39***	-2.62***	0.26	-0.01
5. Creating strategies for collaboration in a challenging interaction	3.60±0.76	3.82±0.69	.27***	-2.85***	0.30	-0.01*
6. Selecting appropriate language to move a conversation forward	3.61±0.77	3.86±0.73	.25***	-3.01***	0.33	-0.01*
7. Listening for underlying values that drive another person's anger	3.55±0.73	3.83±0.80	.22***	-3.19***	0.37	-0.01
8. Identifying facets of yourself that can help you relate to others	3.52±0.70	3.84±0.77	.36***	-4.22***	0.44	-0.01*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[†] Interaction between T1 communication item and Engagement in predicting T2 communication item.

Figure 1. Changes in perceived interpersonal communication skills based on engagement levels

