PRACTICAL TIPS

REVISED 12 Tips for Including Disability Awareness within Undergraduate Medical Education Curricula

[version 2; peer review: 1 approved, 2 approved with reservations]

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Abstract

Disability is extremely common, and there is a need for high quality medical school curricula on working with persons with disabilities. The goal of disability training is to provide the proper knowledge and skills to address the unique needs of PWD, mitigate health disparities, and help shape more compassionate and informed physicians. This article presents 12 tips to incorporate disability training into undergraduate medical education. These tips emphasize the inclusion of PWD in all stages of the curriculum, interprofessional education, experiential learning, and exposure to a range of disability types. By leveraging these tips, educators will be able to create effective learning opportunities and improve the future healthcare of PWD.

Keywords

Disability awareness, Undergraduate medical education, Americans with Disabilities Act, Interprofessional education

Open Peer Review

Approval Status ? ✓ ?

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2. **Linda S Nield**, West Virginia University School of Medicine, Morgantown, West Virginia, USA
3. **Suzanne Smeltzer**, Villanova University, Pennsylvania, USA

Any reports and responses or comments on the article can be found at the end of the article.

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Author roles: Sinha T: Conceptualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Harada CN**: Writing – Review & Editing; **Brooks WS**: Conceptualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Parish A**: Conceptualization, Project Administration, Writing – Original Draft Preparation, Writing – Review & Editing

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First published: 14 May 2024, **14**:32 https://doi.org/10.12688/mep.20329.1

REVISED **Amendments from Version 1**

The authors have edited this manuscript based upon comments from peer review. Caroline N. Harada who provided essential expertise to the revision process has been added as a co-author to the manuscript. The abstract was rewritten to remove specific data that would otherwise require a citation. The former Tip 2 was elevated to Tip #1 and edited to reflect the importance of incorporating persons with disability into all aspects of the curricular design, implementation, and assessment process. The former Tip 1 (now Tip #2) was retitled and restructured to highlight the importance of using a framework for the design and implementation of any disability awareness curriculum. The authors now describe the use of Kern's six-step model of curricular development. The title of Tip 5 was edited for clarity. Aspects of the narratives of Tips 6, 7, 8, 10, 11, and 12 were edited for clarity based upon recommendations by the reviewers. An additional paragraph was added to Tip 9 to caution educators on the risk of promoting ableism when placing learners into disability simulation activities. Finally, additional specific information was added to Tip 12 to provide practical ways in which longitudinal experiences can be included within clinical clerkships and advanced electives.

Any further responses from the reviewers can be found at the end of the article

Introduction

With an estimated population of approximately 50 million, persons with disabilities (PWD) comprise the largest minority group in the U.S. and contribute significantly to the diversity of U.S. residents (Leppert & Schaeffer, 2023; Okoro *et al.*, 2018). PWD face significant health care disparities due in part to their complex medical needs and barriers faced when accessing medical care. As a result, chronic diseases such as obesity, diabetes, and heart disease are more prevalent within this vulnerable population (CDC, 2024). Physicians note that a variety of barriers limit their ability to provide effective care for these individuals, including knowledge gaps, challenges with communication, and a lack of accessible facilities (McMillan *et al.*, 2016). Approximately half of American medical schools have a disability curriculum, which may be why fewer than half of physicians surveyed in one study reported comfort when providing care for this population (Holder *et al.*, 2009; Seidel & Crowe, 2017). Early and frequent exposure of medical trainees to PWD, their unique health care needs, and barriers to effective care is one strategy to address these health disparities and improve medical care for these individuals.

The following 12 tips are provided for medical educators wishing to incorporate disability awareness into the medical training programs at their own institutions. These tips are based upon the authors' experiences with disability awareness education in both undergraduate medical education (UME) and graduate medical education (GME) (Parish *et al.*, 2024; Sinha *et al.*, 2024). These tips have been developed within the theoretical framework of intergroup contact theory (ICT), which stresses the importance of direct contact between minority and majority groups to break down prejudices and foster collaboration and shared understanding (Pettigrew, 1998; Pettigrew & Tropp, 2006). A key tenet of any disability awareness program is the inclusion of PWD into every phase of the process, from development through implementation and assessment.

Tip 1 – Embed persons with disabilities into all phases of the curriculum

Coined during the disability civil rights movement, the slogan "nothing about us without us" refers to the idea that no policy should be decided without involvement of members of the affected group (Chu *et al.*, 2016). Multiple factors contribute to lower quality health care delivery to PWD, which contributes to further health care disparities and poorer health outcomes; these factors would be realistically modifiable with input from PWD (Sharby *et al.*, 2015). PWD must be included in all aspects of disability awareness curricula, including the planning, development (design and content), implementation, and assessment phases. Those who possess lived experiences and voices are most capable of making a longitudinal effect on future medical practice. Failure to engage with PWD can lead to the propagation of ableist ideas and distortion of the most important facets of disability and healthcare. Developing partnerships with local rehabilitation clinics and community centers are great ways to create professional contacts to foster a collaborative approach to disability awareness and recruit PWD to participate as educators.

Tip 2 – Follow Kern's six-step method for curriculum development

As with any curriculum development process, a thoughtfully constructed plan is essential to ensure success. We recommend Kern's six-step model (Thomas *et al.*, 2015). Step 1 is to conduct a general needs assessment for the medical school, and step 2 is to determine the specific needs of the medical students. Since every medical school is unique and medical students enter training from a wide array of backgrounds and experiences, there is no "one-size-fits-all" model for providing disability awareness education. A needs assessment survey and/or set of focus groups involving PWD, students, and other stakeholders can be used to tailor a disability awareness curriculum to meet the unique needs of each medical school. To ensure success, the recommendations of patients with disabilities in the local community should be solicited, to better understand what future physicians need to know. Although there are certainly recommendations that will be consistent from PWD across the globe, there may also be recommendations that are specific to a given community of which educators should be aware. For example, there may be specific cultural or institutional norms that medical students need to learn about for PWD in their community.

Learning objectives, step 3, should aim to address gaps in learner knowledge and align with programmatic learning goals. When identifying educational strategies, step 4, be sure that they align with the overall curricular approach and culture of your medical school to establish continuity of instruction and further contribute to success. For example, if problem-based learning (PBL) is a core curricular element of your medical school, then including patients who have disabilities in one or more PBL cases would be an appropriate strategy. If students

routinely engage in service learning, then partnering with community centers that provide services to PWD would be a great option. After step 5, implementation, a well-executed evaluation plan is pivotal to determine successes and areas of growth and improvement. As noted in Tip 1, be sure to include PWD into each phase of Kern's model.

Tip 3 – Utilize diverse clinicians with experience working with PWD

The Centers for Disease Control and Prevention classifies disability into six types: mobility, cognition, independent living, hearing, vision, and self-care (CDC, 2024). Some medical and health professions, such as physical therapy, occupational therapy, speech-language pathology and physiatry, have specific roles in caring for PWD who have one or more of these disability types. Because of their prevalent roles working with this population, disability awareness is often an accreditation requirement and embedded within their training. For example, Doctor of Physical Therapy (DPT) programs integrate disability awareness, distinctively geared toward mobility-based disability, throughout their curricula (Roush & Sharby, 2011). Therefore, in addition to PWD, it is helpful to integrate healthcare professionals who have experience working with this population into the disability awareness programs. This is particularly important as PWD often require a team-based approach to care that includes a variety of health professions (Reis *et al.*, 2004). Inclusion of clinicians who possess these experiences can help ensure that key considerations and clinical pearls are embedded within the curricula.

Tip 4 – Include Interprofessional Education (IPE) elements

Emphasizing an interprofessional approach when implementing disability awareness curricula is important, because caring for PWD often requires communication and planning as a healthcare team (Iezzoni, 2006; Reis *et al.*, 2004). IPE has been shown as beneficial to learning, skill development, and creating a plan of care (McCave *et al.*, 2019; Visser *et al.*, 2019). It is also important for future physicians to understand the role of other healthcare professionals in treating PWD as it can allow for better patient-client management and referral for those who may have unmet needs. Since many medical schools have associated health professions programs, IPE activities can involve students from physical therapy, occupational therapy, speech-language pathology, nursing, and physician associate programs to name a few. Disability awareness activities provide a robust and practical setting to meet accreditation requirements around IPE.

Tip 5 – Incorporate a broad spectrum of disability types into the curriculum

Disability is neither a single diagnosis nor a single human characteristic. It is a collection of physical or mental impairments that limits life activities, and it can result from myriad illnesses and injuries. Furthermore, people with disabilities are just as diverse as those who do not have a disability. Educational programs that promote disability awareness should strive to be as inclusive as possible and represent the full diversity of this population. One way to do this is to include a breadth of disability types in your instruction and learning experiences:

- Mobility – You could incorporate wheelchair users (manual and powerchair) and have students self-propel themselves in wheelchairs around your educational building.
- Cognition – You could allow students to volunteer at community centers or other sites that provide services to individuals with intellectual and developmental disabilities.
- Vision – You could incorporate a patient with a vision impairment into a PBL or case-based learning session or allow students to volunteer at training sites for service animals.
- Hearing – You could provide a medical sign language class or allow students to practice working with an interpreter to communicate with guests who have hearing impairments.

When adopting Tip 1, be sure to engage a diverse group of PWD in the planning and implementation of the program, ensuring diversity of age, sex, gender, race, ethnicity, disability type, disability etiology (congenital vs. acquired), occupation, etc.

Tip 6 – Include a variety of pedagogies, emphasizing experiential learning

Understanding of disability awareness can be enhanced by using a multitude of pedagogies. While lectures, readings, videos or case studies might inform background information, such as the Americans with Disabilities Act (ADA) and communication etiquette, experiential learning provides hands-on experiences that can provide a unique method for learning. Experiential learning, including direct interaction between students and PWD, should be considered as a focal element of disability curricula. Furthermore, service learning and community outreach activities allow students to see and interact with PWD in non-clinical settings. Bringing PWD onto campus for small group discussions is another way to create valuable learning experiences.

Tip 7 – Ensure access to appropriate equipment and facilities

PWD often utilize assistive and adaptive equipment to help promote independence. As physicians are often the prescribers of equipment, it is imperative to have familiarity with types of equipment and spaces in which equipment is utilized. For example, a commonly prescribed piece of equipment for both short- and long-term mobility impairments is a wheelchair. Having various types of wheelchairs during interactive portions of disability awareness learning activities can allow students to use the equipment, which can spark discussion of costs, proper fit, and parts of wheelchairs that may be needed based on diagnosis. Similarly, gait belts and sliding boards are useful to have students practice how to transfer PWD on and off of an examination table. For language disabilities, communication

devices should be used by students to experience how devices operate. Equipment integrated into the disability awareness curriculum should be diverse and based upon the type of disability being studied to allow for holistic exposure and understanding of the compatible devices that PWD may use.

Tip 8 – Introduce students to the Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a civil rights law that was enacted in 1990 to prohibit discrimination against individuals with disabilities, ensuring that this population has the same rights and opportunities as those without disabilities. Title III of the ADA sets the minimum standards for accessibility of public and privately-owned facilities, directs businesses to make reasonable accommodations when serving people with disabilities, and requires appropriate measures be taken to effectively communicate with individuals who have speech, hearing and vision impairments. Introducing medical students to the basic tenets of the ADA is an essential component of any disability awareness curriculum as it forms the foundation for government-mandated accommodation and accessibility considerations. This should begin as early as new student orientation when medical students are made aware of disability support services for students and processes for obtaining disability-related accommodations. As topics around disability in healthcare and considerations for patients who have specific types of disability are introduced in the formal curriculum, additional details regarding the ADA's role in protecting the rights of PWD can be incorporated through short videos or reading assignments. Other approaches that employ more active methods of instruction include one-on-one and small group conversations about accessibility with individuals who have disabilities and placing students into a variety of ADA compliant and non-compliant facilities. Longitudinal curricular elements such as clinical skills and learning communities offer opportunities for a threaded approach to education around the ADA. Our approach to teaching about the ADA includes both lecture-based content and experiential learning with early and longitudinal exposures.

Tip 9 – Simulate first-hand experiences by placing learners "into the shoes" of PWD

It is important to note that although experiential learning may allow a student to simulate what it is like to have a disability, it is not the same as living with a disability. For our approach, PWD help to create and lead experiential learning activities. This allows medical students to have a more meaningful learning opportunity versus inducing a sympathy-based response for individuals who live with disabilities. For our curriculum, physical therapy students teach medical students how to self-propel a wheelchair. Medical students then self-propel wheelchairs through their educational building alongside individuals who use wheelchairs for mobility. The wheelchair users guide students to experience the ADA-compliant and non-compliant aspects of buildings, sidewalks, and parking during this process. The wheelchair users then have an open dialogue with students to discuss the long-term effects of using a wheelchair for mobility, share their experiences, and answer questions. These meaningful learning contexts can improve student engagement, understanding, and retention of the material all while promoting deeper awareness of the emotional, social, and physical aspects of living with a disability (Laurillard, 2012). Immersing students in these situations helps break down stereotypes, while building a sense of responsibility to improve the lack of inclusivity, the "non-disability-friendly" spaces, and increase patience in their future clinical practice.

Educators should be aware that disability simulation can also have the unintended consequence of promoting ableism and discrimination against PWD. This can happen because in simulation students experience *becoming* disabled, thus overemphasizing trauma of the experience, which can promote pity, negative stereotypes, and underemphasize the social inequalities experienced by PWD over time (Silverman, 2015). Nonetheless, we feel that through thoughtful coaching and debriefing with PWD these unintended consequences can be avoided.

Tip 10 – Create opportunities for open dialog between learners and PWD

Creating opportunities for open dialogue between students and PWD who serve as the facilitators of learning experiences is crucial to fostering a more effective learning environment. These interactions help dispel misconceptions, bridge gaps between learners and facilitators, and foster more encouraging and accepting clinical practice. PWD are underrepresented as educators, but they may reflect images in the mirror for many students and help guide learners in understanding everyday challenges and triumphs for PWD (Anderson *et al.*, 1998). Open channels of communication in the learning environment help build collaborative relationships where facilitators and learners can discuss shared perspective and various views surrounding them as well as uncomfortable but necessary dilemmas (Ta *et al.*, 2023). Whether in the form of a panel discussion or experiential learning activity in pre-clerkship training, a simulated patient encounter, or an authentic clinical experience during the third- and fourth-years, there are ample opportunities within the four-year medical curriculum to incorporate these discussions and effectively utilize PWD as educators. Including a minimum of one learning activity in the pre-clerkship phase and several authentic clinical encounters in the third- and fourth-years is recommended. Through open discussions, everyone's unique abilities and perspectives are acknowledged and integrated to better enhance learning.

Tip 11 – Embed reflective elements into the activities

Adding reflective elements, such as small group debriefs and reflection essays, into a disability curriculum can enhance an already dynamic and inclusive learning environment for learners and facilitators alike. For learners, research has shown that when students combine their learning with reflection, they are able to effectively understand and analyze problems that they could not otherwise (Eyler & Giles, 1999). When students are encouraged to recognize their strengths and weaknesses and assess their learning through self-reflection, they are more likely to adopt those processes going forward (Silverman & Cassaza, 2000). For facilitators, reflection provides structure to their

teaching and encourages them to take responsibility for themselves. By understanding what is effective and what could be improved upon, reflection helps educators create more inclusive curricula with greater relevance and direction for their learners (Daudelin, 1996). Reflective elements can easily be incorporated as part of experiential learning sessions (Tip 6) and open dialogue sessions (Tip 10). Ideally, reflection as a formal or informal learning element should accompany each component of a disability awareness curricular thread. Overall, incorporating reflectiveelements in a disability-based curriculum can enhance the experience for learners and stress continuity while also contributing to the professional growth of PWD as educators, creating a more refined ecosystem.

Tip 12 – Create longitudinal experiences

Currently, only half of U.S. medical schools have a disability awareness program (Seidel & Crowe, 2017). For those that do, most incorporate training within the pre-clinical years but fail to provide experiences in the clinical phase of training, which limits opportunities for application in clinical practice. Both the lack of education and continuity adds to the negative bias and discomfort that many medical students and physicians feel when treating PWD; this only results in worse healthcare and medical attention for PWD (Sharby *et al.*, 2015). The ineffective nature of continued medical education contributes to the discrepancy between evidence/experience-based knowledge and fair practice (Marinopoulos *et al.*, 2007). Thus, it is vital that schools not only incorporate disability training early in medical training but thread these experiences longitudinally throughout training.

During the core clinical clerkships, ensure that students have the ability to interact with patients of *all* disability types. Internal medicine, pediatrics, and neurology clerkships, in particular, should offer ample opportunities for students to participate in the care of PWD from each of the six categories defined by the Centers for Disease Control and Prevention (CDC, 2024). Asynchronous learning modules and simulated patient encounters can be used as supplements when students are unable to work with a specific type of disability. For example, embedding a patient who has a hearing or vision deficit or who uses a wheelchair into a simulation activity that already takes place within a clerkship is an effective way to add depth to a simulation without adding curricular time. Students should also participate in the development of management plans alongside physical or occupational therapists during their acting internships to strengthen their understanding of the complexities of caring for this patient population. Advanced electives in the care of PWD during the fourth year of medical school can provide further opportunities for students to deepen their skills prior to residency training.

Conclusion

The goal of these 12 tips is to provide medical educators with the necessary tools to promote students' awareness of unique considerations when providing care for PWD and foster a platform for PWD to function as key participants in the learning environment. It is crucial that medical schools prepare the next generation of physicians to provide effective healthcare for this population through diverse teaching and learning methods, interprofessional collaboration, and a focus on reflection and continuity. By embracing these tips, the teaching and learning process can become enriching for all stakeholders and cultivate trainees who will be compassionate and confident providers within their future roles.

Ethics and consent

Ethical approval and Consent were not required.

Data availability

No data are associated with this article.

Notes on contributors

Tanvee Sinha is a third-year medical student at the Marnix E. Heersink School of Medicine, University of Alabama at Birmingham. She is also pursuing a Master of Public Health degree. She plans to pursue a residency and career in Physical Medicine and Rehabilitation.

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Open Peer Review

Current Peer Review Status: ? ✓ ?

Version 2

Reviewer Report 18 November 2024

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✓ **Linda S Nield**
West Virginia University School of Medicine, Morgantown, West Virginia, USA

Thank you for the opportunity to review the revised work of Sinha and colleagues. Their twelve tips are comprehensive and clear and will help enhance medical education on this topic. The one minor edit I recommend is to add “(PWD)” to the end of the first sentence of the Abstract to explain this abbreviation which is subsequently used again in the Abstract.

Approval status is "Approved" with the one suggested minor edit as mentioned in my review.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: medical education; MD admissions

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 24 October 2024

https://doi.org/10.21956/mep.22106.r39201

? **Suzanne Smeltzer**
Villanova University, Pennsylvania, USA

While the manuscript addresses an important topic, that is, the need to address disability in medical education, there are some issues that bear authors’ attention:

1. The estimate of prevalence of disability is low. In 2024, the CDC reported 70 million people

in USA to have a disability.

2. Document refers to “medical” care; reviewer would suggest use of “health” care as it is more encompassing and does include medical care.

3. Authors state that “Approximately half of American medical schools have a disability curriculum”, but say nothing about the quality of those curricula. It seems important to do so as not all curricula are the same.

4. Tip 1: would change “these factors would be realistically modifiable” to “most of these factors”.

5. Some elaboration of how the steps of Kern’s approach (mentioned at end of Tip 2) would be accomplished would be helpful addition to Tip 1.

6. Tip 3 makes no mention of the largest workforce in health care (nursing workforce); so it should be mentioned when other healthcare professions are mentioned. Nursing IS mentioned in Tip 4 (once, but discussion is cursory).

7. Tip 6 does not mention family members/caregivers who might be the best informants, especially of individuals with significant IDD or cognitive impairment; so they should be mentioned as possible informants.

8. Tip 8 should mention that many resources…videos, etc….can be accessed for education of students. Inclusion of mention of some examples of these resources would likely be helpful.

9. Tip 9: Should emphasize that the ADA has legal implications; otherwise, too many health care professionals think of ADA requirements as “nice to know” rather than a legal mandate.

10. While the caution about disability simulation experiences was an extremely important addition, another possible negative consequence of these experiences is that “learners” often approach them as a game or a joke. Instead of concluding that having a disability is worse than death (which is the view of too many HCPs), some come away from the experience with the view that it is “not a big deal”. So great caution in using such simulations should be emphasized and PWD must be involved in these simulations. Otherwise, they should be avoided.

11. Tip 12 does not address OB/maternal care and it must do so as women with disability face ableism to a high degree because HCPs fail to consider them appropriate parents (includes males with disability, too). So it must be mentioned as an area of the curriculum and practice where disability is addressed.

12. An issue not addressed in the 12 tips is what content about disability should be addressed and what competencies should be the goal of medical education. I would recommend that the authors review the Core Competencies developed by the Alliance for Disability in Health Care Education, Inc. (ADHCE). The competencies were developed by an interprofessional, multidisciplinary group of healthcare professionals and individuals with disability. The competencies have been reviewed and endorsed by disability and disability advocacy

groups, and major professional organizations, including those from medicine. The National Council on Disability (2022) also endorsed the competencies for use in the education of health care professionals across disciplines. The content of what is or should be taught is missing from the manuscript.

13. A point worth considering for inclusion is that faculty (and many physicians currently in practice) may have received little if any education about the topic in their own education and training. Thus, they, too, will need to receive help in identifying 1) why this important, and 2) how having a disability affects one's ability to receive health care. Further, HCP faculty often believe that they are already teaching adequately about disability (if they are reaching about disabling conditions, which is not the same as teaching about disability), so will be reluctant to add or take on another topic. This needs to be considered in the process and the importance of addressing disability emphasized.

Is the topic of the practical tips discussed accurately in the context of the current literature
Yes

Are all factual statements correct and adequately supported by citations?
Partly

Are arguments sufficiently supported by evidence from the published literature and/or the authors' practice?
Partly

If evidence from practice is presented, are all the underlying source data available to ensure full reproducibility?
Yes

Are the conclusions drawn balanced and justified on the basis of the presented arguments?
Partly

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Version 1

Reviewer Report 19 June 2024

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?

Linda S Nield
West Virginia University School of Medicine, Morgantown, West Virginia, USA

Thank you for the opportunity to review the "12 Tips for Including Disability Awareness within UGME Curricula." The topic is important and an area that must be enhanced in medical school curricula. The authors provide a valuable approach to increasing the topic throughout the curriculum; however, each individual tip could be abbreviated and more focused on one issue; with the provision of at least one concrete example of a learning event included in each tip. Suggested edits to this work are as follows:

Abstract: The first two sentences include information which requires citations. Typically, citations must not be included in an abstract as the abstract must be able to stand alone. Perhaps re-wording is needed here so citations are not required.
Tip 1: There are multiple tips included in this one tip. Perhaps this first tip should be limited to the concept of "identifying gaps."
Tip 2: No recommended edits
Tip 3: No recommended edits
Tip 4: No recommended edits
Tip 5: Comment-This tip is quite similar to Tip 2, regarding the need to include persons with disabilities in the process of creating and embedding learning events throughout the curriculum.
Tip 6: The first sentence is somewhat awkward, therefore, can it be reworded?
Tip 7: Can the authors provide an example of how equipment could be included in an actual learning event? As is written now ("Having access to various types of wheelchairs during interactive...") it is unclear exactly how to include the equipment in teaching.
Tip 8: Can authors provide more guidance and be more specific about where, when and how often the ADA should be incorporated into the curriculum?
Tip 9: Main reason for the "partly" rating. The authors must consider adding information about any potential negatives to "placing learners into the shoes" of persons with disabilities, such as discussed in the work of Dr. Arielle Michal Silverman. See citation from 2015. (Ref -1)
Tip 10: Authors should provide more detail about where, when and how often to include these open dialogues in the curriculum, and in what format.
Tip 11: please see critique of Tip 10.
Tip 12: please see critique of Tip 10. The last sentence about residency programs should be deleted, as these tips are for UGME only.

References

1. Silverman A: The Perils of Playing Blind: Problems with Blindness Simulation and a Better Way to Teach about Blindness. *Journal of Blindness Innovation and Research*. 2015; **5** (2). Publisher Full Text

Is the topic of the practical tips discussed accurately in the context of the current literature
Yes

Are all factual statements correct and adequately supported by citations?

Partly

Are arguments sufficiently supported by evidence from the published literature and/or the authors' practice?
Partly

If evidence from practice is presented, are all the underlying source data available to ensure full reproducibility?
Partly

Are the conclusions drawn balanced and justified on the basis of the presented arguments?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: medical education; MD admissions

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 04 Sep 2024

Will Brooks

Thank you for the helpful review of our manuscript. Below is a point-by-point description of revisions based upon your feedback.

Abstract:

Reviewer Comment: The first two sentences include information which requires citations. Typically, citations must not be included in an abstract as the abstract must be able to stand alone.

Response: Perhaps re-wording is needed here so citations are not required. These sentences were re-worded.

Reviewer Comment: Tip 1: There are multiple tips included in this one tip. Perhaps this first tip should be limited to the concept of "identifying gaps."

Response: We have edited the former Tip 1 (now Tip 2 in the revised manuscript) as "Follow Kern's six-step method for curriculum development". While this remains a multi-part process, the overall tip is now condensed into one coherent and well-described process.

Reviewer Comment: Tip 2: No recommended edits Tip 3: No recommended edits Tip 4: No recommended edits

Reviewer Comment: Tip 5: Comment-This tip is quite similar to Tip 2, regarding the need to include persons with disabilities in the process of creating and embedding learning events throughout the curriculum.

Response: This tip was edited to clarify the emphasis on the need to include a broad diversity of disability types in curricula.

Reviewer Comment: Tip 6: The first sentence is somewhat awkward, therefore, can it be reworded?

Response: The first sentence was rewritten and integrated to make the paragraph sound more concise.

Reviewer Comment: Tip 7: Can the authors provide an example of how equipment could be included in an actual learning event?

Response: As is written now ("Having access to various types of wheelchairs during interactive...") it is unclear exactly how to include the equipment in teaching. More information was added to demonstrate how equipment can be used versus just having access to it.

Reviewer Comment: Tip 8: Can authors provide more guidance and be more specific about where, when and how often the ADA should be incorporated into the curriculum?

Response: Further information has been included in this Tip regarding how the ADA could be incorporated in the curriculum. We have recommended early exposure to coincide with school or course orientation, when information for students who have disabilities is made available and then longitudinal education as part of clinical skills or learning communities programs.

Reviewer Comment: Tip 9: Main reason for the "partly" rating. The authors must consider adding information about any potential negatives to "placing learners into the shoes" of persons with disabilities, such as discussed in the work of Dr. Arielle Michal Silverman. See citation from 2015. (Ref -1)

Response: Thanks for this helpful suggestion. This information has been added.

Reviewer Comment: Tip 10: Authors should provide more detail about where, when and how often to include these open dialogues in the curriculum, and in what format.

Response: Thank you. While there is no prescription for necessary timing of open dialogue, we have provided a list of options for successful incorporation during the pre-clinical and clinical years of training. We have recommended at least 1 activity in the preclinical phase and several authentic clinical encounters in the third- and fourth-years.

Reviewer Comment: Tip 11: please see critique of Tip 10.

Response: We have added the following to Tip 11: “Reflective elements can easily be incorporated as part of experiential learning sessions (Tip 9) and open dialogue sessions (Tip 10). Ideally, reflection as a formal or informal learning element should accompany each component of a disability awareness curricular thread.

Reviewer Comment: Tip 12: please see critique of Tip 10. The last sentence about residency programs should be deleted, as these tips are for UGME only.

Response: We have edited Tip 12 to include more specific recommendations around clerkships, acting internships, and advanced clinical electives. We have also removed the last sentence about residency programs as suggested.

Competing Interests: No competing interests were disclosed.

Reviewer Report 13 June 2024

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Ami L DeWaters
Penn State College of Medicine, Hershey, Pennsylvania, USA

This 12 tips article summarizes recommendations for building curricula within undergraduate medical education on the topic of disability awareness.

While this is undoubtedly an extremely important topic, and the authors are to be commended for tackling it, the tips are currently too general to provide insight into the unique considerations for disability content.

In particular, tips 1, 6, 11, and 12, are tips that would apply to any curricular innovation, and is not specific to disability. Therefore, I would recommend either replacing these with more specific and relevant tips to disability curricula, or condensing them into one tip, such as "follow Kern's method for curriculum development."

In addition, and most importantly, one of the most important aspects of developing curriculum on caring for patients with disabilities is not listed as a tip; it is essential that persons with disabilities be included in the design of the curriculum. In my opinion, this must be included as a tip in any perspective piece about building curricula on disability awareness.

Is the topic of the practical tips discussed accurately in the context of the current literature
Partly

Are all factual statements correct and adequately supported by citations?
Yes

Are arguments sufficiently supported by evidence from the published literature and/or the authors' practice?
Partly

If evidence from practice is presented, are all the underlying source data available to ensure full reproducibility?
Yes

Are the conclusions drawn balanced and justified on the basis of the presented arguments?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Curriculum development, health systems science, systems-based practice, disability education

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 04 Sep 2024

Will Brooks

Thank you for the helpful review of our manuscript.

We have re-titled the former Tip 1 (now Tip 2 in the revised manuscript) as "Follow Kern's six-step method for curriculum development" and reworked this section to include each of the six phases described in his book. We do not feel that Tips 6 (Include a variety of pedagogies, emphasizing experiential learning), 11 (Embed reflective elements), and 12 (Create longitudinal experiences) fit precisely within Kern's model, yet are important in the context of disability awareness promotion.

Therefore, we have elected to keep those as separate and unique tips to highlight their importance. The title and focus of the former Tip 2 is "Embed PWD into all phases of the curriculum".

We agree wholeheartedly with the reviewer that persons with disabilities MUST be included in the planning, design, implementation, and evaluation of a disability awareness curriculum. We have elevated this to Tip 1 in the revised manuscript and replaced the abbreviation "PWD" from the title with "persons with disabilities" to accentuate this tip and highlight its importance.

Competing Interests: No competing interests were disclosed.