

Residents as Teachers: Benefits of Creating Infographics

Christopher M. Haymaker, PhD | Kirsten A. Porter-Stransky, PhD | Adam Channell, PhD

PRiMER. 2024;8:15.

Published: 2/19/2024 | DOI: 10.22454/PRiMER.2024.403662

Abstract

Introduction: While family medicine (FM) residents are expected to develop teaching skills during their residency, they often develop their approach to teaching informally, with limited explicit instruction in best teaching practices for patients or near peers. Infographics have become an increasingly common tool for teaching because of their ease of use and consistency of message. We explored the impact of an infographic assignment on residents' teaching practices and perceptions of teaching.

Methods: First- and second-year residents were assigned to create infographics on a topic of their choice. We transcribed and analyzed interviews using applied thematic analysis.

Results: Residents indicated that the assignment helped them to integrate medical knowledge, identify pertinent points, and intentionally consider how they present information.

Conclusion: Creating infographics is a useful way to develop residents' teaching skills within the context of patient care. For most residents, explicit discussion of their approach to teaching was a new experience, suggesting that more frequent and explicit reflection on teaching could benefit residents, patients, and FM residency programs.

Introduction

Accreditation Council for Graduate Medical Education (ACGME) requirements emphasize resident teaching as a component of professionalism.¹ Residents usually develop teaching skill² via a "see one, do one, teach one" approach, accompanied by the assumption that teaching capability signifies mastery.²⁻⁴ Many teaching curricula rely on implicit learning from exposure to teaching encounters, without explicit instruction on teaching best practices or discussing teaching within professional identity. Resident learners have few formal opportunities to reflect on teaching.

There is sparse scholarship examining the impact of specific assignments on teaching identity, particularly in programs without a formal "resident as teacher" curriculum. We developed an infographic assignment for residents. Infographics have become an important, evidence-based modality for delivering information.⁵ Infographics condense content and use visual-spatial organizers to facilitate learning. Developing an infographic requires active engagement, similar to other forms of experiential learning and reflection.⁶ Medical learners and teaching faculty can utilize infographics to review complex information, making them useful just-

in-time teaching tools for busy clinical environments.⁷ Our qualitative study used semistructured interviews to explore the impact of this innovative infographic assignment on residents' teaching practices and their thinking about teaching.

Methods

Participants and Procedures

First- and second-year family medicine residents had 2 weeks to complete an infographic assignment about a topic of their choosing. Residents received in-person instruction at the beginning of the rotation in how to construct an infographic.⁸ Some residents sought coaching depending on whether they hoped to use their infographic with patients or peers. Author C.H. conducted, recorded, and transcribed the 14 interviews. One resident participated in the interview both first and second year, resulting in seven year-1 interviews and seven year-2 interviews. Seven of the residents identified as female, five as male. At the end of their behavioral health rotation, residents participated in a recorded interview about their project and ideas about teaching.^{8,9} Residents received formative feedback about their infographic from C.H. after their interview.

Transcripts were developed from Microsoft Teams (Microsoft Corp, Redmond, WA) closed captioning and verified by reviewing draft transcripts while rewatching videos.

This study was deemed exempt by the institutional review board at Western Michigan University Homer Stryker M.D. School of Medicine.

Analysis

We analyzed deidentified transcripts using applied thematic analysis.¹⁰ We discussed preliminary codes. Similar codes were combined into themes. After five interviews, coders suggested additional questions for subsequent interviews to elaborate on emerging themes. Saturation¹¹ emerged after 14 interviews. All transcripts were read by all authors and coded iteratively by two faculty (K.A.P.S. and A.C.) without connection to the residency program. All authors met regularly and came to consensus on the final themes. Strategies for validating the findings included investigator triangulation, reflexivity, and having a diverse study team including a clinical psychologist, medical science educator, and general science educator.

Results

Thematic analysis of transcripts resulted in five themes, providing insight into residents' infographic process and its impact on perceptions of teaching. Example quotations are shown in Table 1.

Theme 1: Infographic Research to Solidify Medical Knowledge

To make the infographic, residents needed to find relevant medical literature on their topic. Finding and reading such material benefited the resident as a teacher and learner. The research process helped them affirm their knowledge of the subject and evaluate the quality of the data that inform practice.

Theme 2: Streamlining Information for the Target Audience

Multiple residents experienced the difficulty of identifying the key points and eliminating unnecessary detail. Residents described the importance of distilling medical information into an essential message.

Theme 3: Infographic Aesthetics for Teaching

Some residents commented that they spent time finding or creating informative, clear figures for their infographics. They understood that a good infographic should be visually appealing to support the educational

content. Related to Theme 2, creating bullet points instead of large blocks of text contributes to the aesthetics and educational value of the infographic.

Theme 4: Residents as Patient Teachers

Most residents recognized that teaching patients is an integral part of family medicine. Most identified their primary teaching audience as patients. Only a few residents commented on teaching medical students and other residents. Few residents expressed interest or comfort in teaching their infographic to faculty, consistent with the traditional hierarchy of medicine and their own insecurities.

Theme 5: Novice Teaching Philosophies

Consistent with their stage of training, most residents did not have well developed teaching philosophies. For example, in response to the question, “Do you have a teaching philosophy?”, a resident responded, “I’m not really sure.” A few residents explained their approach to teaching.

Discussion

Residents noted benefit from developing infographics. Consistent with the above themes, residents indicated that the assignment helped them integrate knowledge, set priorities, practice conciseness, and tailor information for an audience. Many found value in creating an aesthetic that helped integrate their teaching points. Most saw a role for teaching with patients. Few had considered their teaching practices formally.

Conclusions drawn from this scholarship should be considered within the limitations of qualitative work generally. We interviewed a sample of family medicine residents who delivered feedback from their unique perspectives. While in-depth, qualitative reactions may be valuable in evaluation of curriculum, they fall under Kirkpatrick level 1 evidence.

Residents are early in their teaching journey. They have neither thought much about nor had significant formal training in teaching. Communication skills and patient care strategies are rarely framed in terms of teaching, even though relationship building, communication, and motivation are central to patient care and teaching. Without explicit prompts and examples, residents and other learners may fail to translate these concepts into a cohesive philosophy for teaching outside of their pragmatic skills for patient care. Curricular interventions such as this infographic assignment can promote these skills and prompt intentional conversations.

Residency is a developmental process; tasks should have a developmental progression.^{12,13} Residents would benefit from more explicit instruction about teaching throughout residency. Given the reliance on resident physicians to teach, curricula focused on teaching practices could enhance teaching and learning.⁴ This study demonstrates that infographic development can be useful for family medicine residents to grow their teaching skills.

Tables and Figures

Table 1. Themes and Sample Quotations

Theme	Example quotations
1: Infographic research to solidify medical knowledge	<p><i>“The benefit is it helps me come up with different ways of finding information that I can teach to students or residents in the future...There’s a world out there that can teach you stuff more than Up-to-Date...It helps me learn as well. Helps me absorb the material, so I’m able to incorporate into my daily life in the outpatient setting.” (11.1)</i></p> <p><i>“It was good for me to look through some of the research and...verifying things that I just had believed and had grown to, you know, to actually make sure there was data to support that which I knew..., but also to see where the data is not as strong as I would like to believe...” (3.2)</i></p>
2: Streamlining information for the target audience	<p><i>“It’s harder than it looks for sure. That was...something that I...learn[ed], ‘cause you just see like one like small sheet with like a couple of words on there. And I’m like...that doesn’t seem that bad but really like if you’re reading articles and trying to research on the project, it was very hard to like keep it concise... there’s a lot of like important things that I wanted to add and it’s hard to just pinpoint like one thing.” (12.2)</i></p>
3: Infographic aesthetics for teaching	<p><i>“I did spend time on the beautification of it. But it’s something I enjoy... It’s connected to my teaching, I would say yeah, in that I I want something that that pops... Not a million words where, you know, people are gonna be like this is too much... I want it to be able to be appealing and informative at the same time.” (11.2)</i></p>
4: Residents as patient teachers	<p><i>“Teaching is something we do every day. It’s reinforcing behaviors, reinforcing treatment plans with patients.” (11.2)</i></p> <p><i>“I love teaching patients...I can break it down to the point where if a patient is having trouble with these big medical words and I can break it down to simple, the smile on their face is tremendous...” (9.1)</i></p> <p><i>“I think like other residents probably already have, like their own technique on like what they’re doing for clinic and seeing their patients. I don’t know if this would really apply to them. But this is like I think for someone that... hasn’t done it before, or even just coming into third year [of medical school].” (1.2)</i></p>
5: Novice teaching philosophies	<p><i>“...you just have to meet people where they are...and where their level of knowledge is. For some people I find I have to use a lot of metaphors and keep it very simple.” (13.2)</i></p>

Corresponding Author

Christopher M. Haymaker, PhD

Western Michigan Homer Stryker School of Medicine, 1000 Oakland Drive, Kalamazoo, MI 49008.

269-349-2641, ext. 439. Fax: 269-488-8978.

Chris.haymaker@med.wmich.edu

Author Affiliations

Christopher M. Haymaker, PhD - Western Michigan Homer Stryker MD School of Medicine, Kalamazoo, MI

Kirsten A. Porter-Stransky, PhD - University of South Carolina School of Medicine Greenville, Greenville, SC |

Western Michigan Homer Stryker MD School of Medicine, Kalamazoo, MI

Adam Channell, PhD - Western Michigan Homer Stryker MD School of Medicine, Kalamazoo, MI

References

1. Accreditation Council for Graduate Medical Education. Common program requirements. Published 2022. Accessed April 18, 2022. <https://www.acgme.org/What-We-Do/Accreditation/Common-Program-Requirements>
2. McKeon BA, Ricciotti HA, Sandora TJ, et al. A consensus guideline to support resident-as-teacher programs and enhance the culture of teaching and learning. *J Grad Med Educ*. 2019;11(3):313-318. doi:10.4300/JGME-D-18-00612.1
3. Rodriguez-Paz JM, Kennedy M, Salas E, et al. Beyond “see one, do one, teach one”: toward a different training paradigm. *Postgrad Med J*. 2009;85(1003):244-249. doi:10.1136/qshc.2007.023903
4. Ramani S, Mann K, Taylor D, Thampy H. Residents as teachers: Near peer learning in clinical work

- settings: AMEE Guide No. 106. *Med Teach*. 2016;38(7):642-655. doi:10.3109/0142159X.2016.1147540
5. Hernandez-Sanchez S, Moreno-Perez V, Garcia-Campos J, Marco-Lledó J, Navarrete-Muñoz EM, Lozano-Quijada C. Twelve tips to make successful medical infographics. *Med Teach*. 2021;43(12):1353-1359. doi:10.1080/0142159X.2020.1855323
 6. Stephens MB, Bowen JL, McGinley EL, Rainey P. Organizing chaos: iterative professional identity formation through the lens of mask making. *PRiMER Peer-Rev Rep Med Educ Res*. 2020;4:10. doi:10.22454/PRiMER.2020.705788
 7. Orner D, Fornari A, Marks S, Kreider T. Impact of using infographics as a novel Just-in-Time-Teaching (JiTT) tool to develop Residents as Teachers. *MedEdPublish*. 2021;9(1):289. doi:10.15694/mep.2020.000289.1
 8. Haymaker CM. Sample Infographic Assignment Instructions. STFM Resource Library. Published 2023. Accessed June 5, 2023. <https://resourcelibrary.stfm.org/viewdocument/sample-infographic-assignment-instr?CommunityKey=2751b51d-483f-45e2-81de-4faced0a290a&tab=librarydocuments>
 9. Haymaker C, Porter-Stransky K, Channell A. Semi-structured interview questions to explore residents teaching identity as influenced by an assignment to create an infographic. STFM Resource Library. Published 2023. Accessed June 5, 2023. <https://resourcelibrary.stfm.org/viewdocument/semi-structured-interview-questions?CommunityKey=2751b51d-483f-45e2-81de-4faced0a290a&tab=librarydocuments>
 10. Guest G, MacQueen KM, Namey EE. *Applied Thematic Analysis*. SAGE Publications; 2012. doi:10.4135/9781483384436
 11. Cobern WW. *When Interviewing: How Many Is Enough?* The Malinson Institute for Science Education; 2018.
 12. Saucier A, Gillies RA, Kriegel DL, et al. Exploring family medicine residents' experiences teaching medical students. *PRiMER Peer-Rev Rep Med Educ Res*. 2021;5:41. doi:10.22454/PRiMER.2021.196761
 13. Ridgway A, Roe C, Cumberworth J. See one, do one, teach none: towards formal teacher training in undergraduate medicine. *Med Teach*. 2015;37(10):974. doi:10.3109/0142159X.2015.1045854

Copyright © 2024 by the Society of Teachers of Family Medicine