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Title

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Permalink

<https://escholarship.org/uc/item/9cm6g2rm>

Journal

Academic Psychiatry, 38(6)

Author

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Publication Date

2014-12-01

DOI

10.1007/s40596-014-0190-z

Peer reviewed



Published in final edited form as:

Acad Psychiatry. 2014 December ; 38(6): 709–715. doi:10.1007/s40596-014-0190-z.

Preparing and presenting effective abstracts and posters in psychiatry

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Abstract

Presenting an abstract and a poster gives scientists from all fields, including psychiatry, an important opportunity to introduce their research to others. Researchers and mental health professionals at all levels of career development can use several media resources to assist them with the technical aspects of preparing an abstract or a poster. This article will focus on major principles associated with preparing and presenting an abstract and a poster at a scientific meeting. A literature search using NIH PubMed was conducted to identify peer and non-peer-reviewed articles that provide methods for effective abstract and poster presentation for the period of 1966 to June 2014. First, we review the purpose and relative importance of abstracts and posters in academic settings. Next, we describe the qualities of an effective abstract and poster and common pitfalls that may occur. Finally, we present a systematic approach to preparing and presenting an abstract and a poster in a scientific setting. Several sources consistently suggest that readability, organization, and succinctness are qualities that make an effective and successful abstract and poster. Mental health professionals in all stages of their career development may benefit from following these guidelines in presenting their scientific work.

Keywords

poster; presentation; academic; psychiatry; career development

INTRODUCTION

Poster presentations convey scientific knowledge through visual representation at academic meetings across a variety of scientific subspecialties (1). They are effective vehicles for introducing new and soon to be published scientific data. The impact of posters on conveying academic knowledge is generally well accepted, with the visual appeal combined with effective author presentation of academic content being among the more influential factors on successful impact (2). Some fields dispute this impact with concerns that data from poster presentations are sometimes too preliminary to survive the rigor of academic peer review (3–5). In addition, some have observed that poster sessions serve limited

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DISCLOSURES

On behalf of all authors, the corresponding author states that there is no conflict of interest.

function, benefiting mostly young investigators and poster chairpersons, compared to other components of an academic program (6). Nevertheless, most agree that poster presentations offer an ideal opportunity to disseminate research findings (7) and can be an important catalyst for manuscript preparation (8). Successful academicians have long known that posters can facilitate promotion in academic positions and can even create new job opportunities. They also help fellows and early career faculty to think critically, to develop a national reputation, and to network and develop collaborations (8). For anyone considering an academic career, these benefits become apparent fairly early in academic tenure when individuals share their scientific results in a nonthreatening and collegial atmosphere.

There are surprisingly few resources available to guide mental health professionals on how to effectively present their research in the form of a poster. This is of great concern given the widespread engagement in research activities in academic psychiatry departments (9). Indeed, among key determinants for longer academic survival full-time researchers are research training and affiliation with a major psychiatric research institution (10), underscoring the critical roles of training and environment in shaping an academic career in psychiatry. Moreover, the feasibility of introducing research training during psychiatry residency training is well established (11). This is an excellent developmental stage to acquire skills in research presentation using multiple platforms. This article aims to provide trainees in psychiatry and other mental health professions across all stages of career development the tools needed to design and effectively present a poster at a scientific meeting. These skills may also apply to other forms of scientific presentation. In fact, some experienced researchers have found that mastering skills in poster presentation can enhance presentation skills more generally. First, we will discuss the merits of an effective poster and common pitfalls associated with an unsuccessful poster.

There are several qualities that make a good poster. Many sources consistently suggest that readability, organization, and succinctness make an effective and successful poster (12-13). Researchers can achieve these qualities if they determine the main message or thesis of the poster and then assemble components to provide supporting evidence and illustration of their message, which can be communicated fairly succinctly to anyone viewing the poster. Indeed, first impressions count (14), and posters that ranked as among the best were reliably identified based on factors such as presentation, message, and star-quality. In contrast, facts, originality, and the science presented in a poster were less reliable indicators of top-ranked posters. All of these factors have been used as guidelines to score posters. Some academic meetings will post high-scoring posters during or after the meeting, or give out prizes for top-ranking posters, yielding even greater exposure to the research that was presented. Table 1 provides advice on how to optimize your poster experience to lead to further opportunities.

Problems with posters most frequently arise when they are given less importance than oral presentations or published papers (15). Miller et al. (13) outline several important pitfalls associated with unsuccessful or ineffective posters. First, presenters may fail to appreciate the opportunity offered by a poster to convey their findings while interacting with individual viewers. Second, they may neglect to adapt detailed narratives and statistical tables into readable text, bullets, and charts. These missteps render the poster difficult to read and readers have a hard time quickly grasping its key points. Third, by simply posting pages

from a paper, presenters risk having viewers skim their work while standing in a large conference hall. Brief narrative descriptions summarizing one's work can serve to both initiate a conversation with colleagues about the key message being conveyed, which may then lead to more detailed feedback or collaboration. Finally, presenters may forget the range of specialties and training backgrounds to which they are presenting. It is essential to know one's audience for effective and respectful scientific communication. Presenters do not want to leave those visiting their posters with the onerous task of interpreting their findings, particularly if they are complex or difficult to understand. In most contemporary scientific settings, it is helpful to be prepared for an interdisciplinary research audience and communicate a message that has real world application (16). Presenters who pay attention to the do's and the don'ts of poster layout, format, content, and presentation (17), are more likely to be successful in using this medium for scientific communication. We now review the literature for guidance on how to make an effective poster.

METHOD

A literature search using NIH PubMed was conducted to identify peer and non-peer-reviewed articles that provide methods for effective poster presentation for the period of 1966 to December 2013. The following terms were included in the search: "poster" or "presentation" or with "academic," and "meetings," "psychiatry," or "training," followed by "career development." References from identified articles were also reviewed to ensure that all relevant papers were included.

RESULTS

The nuts and bolts of how to make an effective poster are straightforward but may come with several challenges if steps are inadequately considered, missed, or left to complete with insufficient time. Figure 1 provides a flow chart summary of a stepwise approach to preparing a poster. The first step is to identify a topic of interest or scientific question. Topics suitable for a poster may be broad in scope and can report on any stage of a research project. For example, one may choose to report an original study (descriptive, observational, retrospective, or experimental), an evaluation of a method, device, or protocol, or present a case report or case series. Once a scientific question and the corresponding data have been identified, an abstract can be written (see section on how to prepare an abstract below). Abstracts are submitted to professional meetings based on the abstract topic or based on the theme of the academic meeting. Organizations hosting professional meetings will invite scientists to submit an abstract several months before the meeting, with specific guidelines for abstract submission. A committee of peers is tasked by the organization to compile a scientific program for the meeting and critically reviews the abstracts. There is no guarantee that an abstract submitted for a poster presentation is accepted. There are several factors that lead to the acceptance of an abstract: adherence to the submission guidelines (some organizations will plainly state that abstracts will automatically be rejected if they do not adhere to such guidelines), presentation of new and original data (versus previously presented or published data or a review of the literature), excellent scholarship with inclusion of references, innovation, indication of comparisons or control groups and

standardized measures of assessment, and complete studies (versus incomplete studies that promise later results).

How to prepare an abstract

An abstract serves the central purpose of introducing an audience to work that is summarized in a clear and succinct overview. Following three simple steps may aid in preparing a successful abstract that invites an audience to learn more about the research. The first step is to review and understand the requirements for writing the abstract, taking careful consideration of the target audience. Many abstracts follow structure and word limit requirements that are usually posted in a call for papers by a conference planning committee. For example, the structure may include subsections such as a background, methods, results, and conclusion. Thus, the second step while writing the abstract, is to identify the significance and purpose of the study (objectives), explain the approach (methods) and the findings (results), and summarize the implications of the study (conclusions). Third, the abstract should be formatted to ensure that it follows a logical order. Be sure to employ important words or phrases that are key to signaling the research and avoid using abbreviations or acronyms with ambiguous references or phrases that leave a reader hanging. The abstract is the part of the poster that is most frequently read by the audience, and is commonly accessible even to those who cannot view the poster in person through conference proceedings. Some organizations will publish their conference proceedings in their companion journal, enabling an author to count the abstract as a publication.

Once a well-prepared abstract is accepted, it can be used as the outline for the poster content. Before laying out the components of a poster, this is a good time to carefully read any instructions that may have been sent by meeting organizers regarding the poster presentation. Specifically, they will commonly send instructions about the size requirements of the poster and the date, time, and location presenters have been assigned to present their posters. It is important to review the size dimensions prior to constructing the poster, as it can be tedious to adjust the size once all of the content has been laid out. A poster may not be permitted for presentation or will stand out at the meeting in an undesirable way if it is not the right size. Presenters should aim to invite positive rather than negative attention to their work, so reviewing the criteria for poster display is a critical initial step.

As noted above, most abstracts follow a specific organizational format, which includes elements such as an introduction or background, methods, results, discussion and conclusion. These elements can then be broken down into separate sections of the poster. Figure 2 provides a sample template of a poster. Typically, the abstract will be the first element, and gives the audience a chance to review the cursory summary of your work. The abstract may be placed directly under the banner or title of the poster, which, in some instances is considered the most important part of the poster because it is the most eye-catching. Some meetings may require that the title in the banner and poster be a specific size and font so that it is easily readable to the audience from a typical distance of three feet (12). The title of the poster generally corresponds to the title of the abstract submitted and should be relatively short but informative about the nature of the study. Directly under the title are author names followed by institutional affiliations. Contributions to the work presented in

the poster will vary from one individual to another, but this is an excellent opportunity to acknowledge the hard work of the entire research team. It is helpful to review with colleagues and mentors who to include as a co-author on the poster and in what order. In some instances, organizations will place identifiers on the banner of the poster to signal the audience if a poster has won an award or if the presenter is a new investigator or a mentor. It is also helpful if presenters do not typically carry a business card or handouts of the poster, to have contact information listed in the corner of the banner to invite people for future contact. The abstract that follows under the banner is typically written exactly as was submitted unless results have significantly changed after interim analyses. These changes or updates are more common than not, and can lead to discrepancies between abstracts submitted and those published in proceedings handbooks and the actual poster presentations. In fact, one study found that up to 76% of abstracts in a proceedings handbooks were discrepant from their corresponding poster presentations, suggesting that attending the poster was the best way to get the most up to date information about the research of interest (18). Certainly, the abstract should be consistent with the data being presented in the poster because the abstract and the banner will likely be the most frequently read portions of the poster. It will summarize the objectives of the study, the methodological approach employed, the results, and the major conclusions drawn from the results. These are then elaborated in subsequent elements of the poster.

The introduction section follows generally below the abstract, and provides a background context and purpose for conducting the study being presented. It is helpful here to expand on the importance of the study and why it might be particularly relevant to the audience. Then, the research question is proposed, followed by hypotheses about the outcome of the study. These predictions may be informed by prior literature that should be referenced, or may be based on predictions of work that has been previously presented. When presenting this section of the poster, it is helpful to get the background of the audience to facilitate their engagement with the poster presentation.

The next element summarizes the methods of the poster. Here, bulleted text is often preferred to provide succinct, clear statements about how the study was conducted. The information should be sufficient for another researcher to be able to replicate the presenter's approach (12), but since space is limited, this may be an area that is expanded on during a discussion with the audience, or in response to specific questions that are posed to the presenter. The methods should demonstrate a valid approach to answering the scientific question, providing sufficient information about the sample (from which population it was derived, selection criteria, group assignment), the materials or interventions used, and the statistical approach to analyzing primary and secondary outcome measures. It is easy to get bogged down in this section and provide too much detail that may not be within the scope of a poster presentation. One may be particularly vulnerable to losing the interest of his audience while presenting this component of the poster. The presenter should decide what is the most important aspect of the methods that need to be communicated and reassure herself that she will be able to provide additional detail to anyone requesting it while she presents her poster.

The results section is another component of the poster that will likely receive relatively more attention than other sections. Attendees at poster sessions are very interested in understanding how presenters answered their scientific questions and how the groups that were studied compared to one another on the major outcome measures. Graphical presentation of data is often necessary and helps to illustrate data in ways words cannot. It is important to make sure that any tables and figures used are clear and self-explanatory, with appropriate use of error bars to define variance around results and legends to define variables.

In the discussion section of the poster, presenters should take time to reflect on the significance of their findings in the context of the current study, as well as in the context of the broader field. It is useful to review the literature on related studies and offer some insights about how the study compares to those already published. It is very likely that the results presented will either support the extant literature on the topic or contradict them, warranting an explanation for differences in findings. Presenters should offer limitations of their current study and suggestions for future directions to address the scientific question proposed. This section requires some inferential thinking and may spark fruitful discussions at the poster session. Presenters often will derive more ideas from their audience about the interpretation of the results so it is important for presenters to be attuned to that. A concluding statement should relate the initial research question and predictions to the study results, tying the poster together.

Below the discussion and conclusions is a place to include references for any key literature that is related to the study. The format of the references should be consistent with the text. Including references is an important gesture that adds to the validity of the work presented and acknowledges how the research may be related to the larger field. It is quite possible that an author who has been cited in the poster will come to view the poster, at which point it will be important to have knowledge both of the work being presented as well as that of the author who was cited. If a presenter should strike such luck as to meet an author he has cited, he should take advantage of the opportunity to learn more about her work and the impact it has on the presenter's study.

Finally, many organizations are now requiring presenters to report on their poster all relevant funding sources for their study and disclosure of any potential conflicts of interests. This has become an essential component for most posters presented at psychiatric meetings and will certainly be required if the work is eventually published. The integrity of the research presented depends on disclosures of any potential distorting influences where they may exist, and the audience may then judge and determine the impact of bias on the information being presented. Investigators should not view this requirement as punitive or avoid engaging in research involving interventions or devices sponsored by industry. This is just a part of being a scientist in era of open disclosure.

Once the elements have been developed and assembled, the poster is ready to be constructed. After reworking initial drafts, presenters should seek feedback from their mentors. Presenters will likely have several months between the time the poster's abstract is accepted to the actual date of presentation. Researchers should not procrastinate and leave

their preparation until the last minute (19). Mentors will appreciate the advanced notice and the ability to provide meaningful feedback well before the meeting. Presenters should remember that their mentors will also likely have to prepare for presenting at the same meeting. Moreover, if it is a presenter's first time presenting, she should engage her research team to provide her with some constructive preliminary feedback and to simulate the poster experience so that she is ready to address any questions that might be posed to her about her work. Another set of eyes is always useful to check for any typos, stylistic, or grammatical errors that presenters may not be aware of in their preparation. It is sometimes also helpful to get feedback from individuals who are not in the same field to get a sense of how the research might be evaluated by someone in a less related area. Upon finalizing a poster, presenters may choose a variety of different ways to print or display their poster, and there are a variety of online resources for poster presentations. Indeed, resources across institutions are highly variable, with some institutions having in-house facilities and staff to help with poster printing, and others requiring the use of printing vendors, such as FedEx Office Print & Ship Services or The UPS Store, which may have branches available local to where the academic meeting is held. In recent years, the scientific community has made tremendous strides in poster production (15, 20-21), which eventually may lead to more technologically advanced formats, eliminating the need for paper altogether.

The next step in the process is the poster presentation. Some meetings offer an opportunity for early viewing of posters including on electronic platforms during the weeks leading to the meeting, and may request that the poster be placed on its designated board the morning of the presentation. Presenters should strive to be on time for the poster session, and try to remain at the poster as much as possible to be available to answer any questions by those viewing the poster. It is helpful to have a 2 minute summary of the poster, when if requested, the presenter can walk people through the various components in a relatively efficient manner. Presenters should be open to interruption and feedback during this presentation because among other reasons, it may improve the study, especially if it is being considered for publication. A two-minute summary of the poster becomes easier to present as the session carries on because presenters become adept in gauging their audience, revising their presentation approach, and getting to the heart of their message efficiently. This iterative process in a relaxed, nonthreatening environment (22) makes a poster presentation unique and very enjoyable for both presenters and their audience. Institutions and research laboratories commonly like to display the posters after the academic meeting, so it is helpful to check with advisors to see if a poster should be transported back from the conference (Text Box 1).

After the poster session, it is helpful for presenters to record some of the feedback they received from the people they met. This will enrich their discussion with their mentors and colleagues after the meeting to debrief on the experience and plan for next steps related to the study or for future projects (Table 2). As mentioned earlier, there are several skeptics who believe that poster presentations carry limited weight in scientific process, or criticize posters for not being memorable events in scientific meetings (23). Among the most rewarding aspects of presenting a poster is the ability to utilize that medium to facilitate publication of research. If this is seen as the final step to the poster process, it can be a fruitful way to becoming a prolific author. This is commonly the case because in academics,

one is often attending several meetings a year, and while manuscripts often do not have deadlines associated with them, abstracts for meetings do. Thus, there is no better way to take advantage of that stimulus to produce and analyze data than to simply move that work from poster to publication. It is also true that posters provide a helpful template for the initial draft of a manuscript. This fact combined with the feedback presenters receive at their posters can help them write and submit a manuscript that has already anticipated concerns that would be raised by reviewers. For these reasons, the last step for presenting a poster should be preparing it for publication.

CONCLUSION

In this review, the purpose and importance of poster presentations were described and the qualities and pitfalls of this medium were summarized. Current opinion based on a review of the literature is that posters offer an opportunity to clearly and succinctly communicate research findings to colleagues, mentors, and potential future collaborators. The presentation of a poster offers mental health professionals a chance to network with peers and receive important feedback on their work in a nonthreatening environment. Eventually, this can lead to recognition, establishment of expertise, and possibly career advancement. A poster can serve as an effective stimulus for the publication of scientific work, and if prepared and presented systematically, can be highly rewarding throughout an academic career.

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Text Box 1: Implications for Mentors

- Mentors should encourage their students to present their scholarly work in the form of a poster at an academic meeting.
- Well-mentored poster presentations can help trainees learn to connect with their audience, to direct and hold their audience's attention, and to enhance understanding and memory of their work with a clear take away message.
- Trainees learn much from observing how their mentors network during an academic meeting.
- Mentors should support their trainees by attending their posters and providing feedback to other trainees who are presenting at academic meetings.
- Debriefing with trainees after a poster presentation can stimulate plans for next steps for the academic work, including publication.



Figure 1.
Steps to preparing and presenting a poster

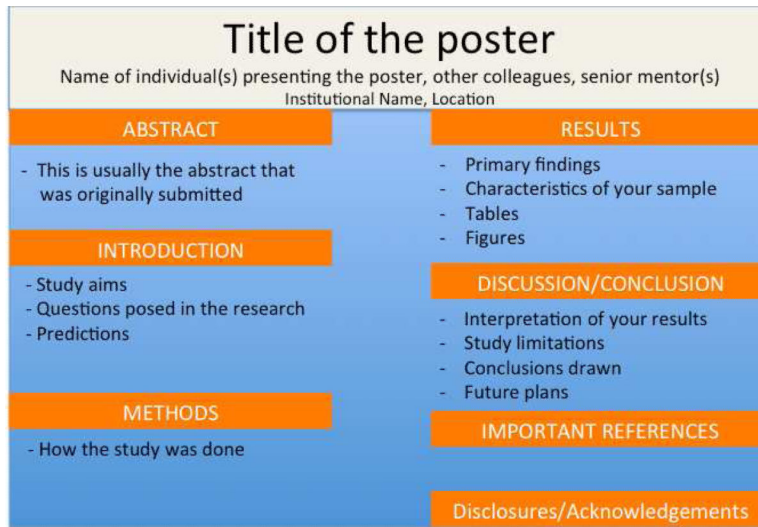


Figure 2.
General layout of a poster

Table 1

How to make your poster experience rewarding [adapted from *The Academic Medicine Handbook*.(24)]

1. Get an early start so you have enough time to receive feedback from your mentors prior to your poster presentation – they can catch typos and improve your poster. They can also help you anticipate questions.
2. Present posters at meetings that will enable you to share your work with colleagues and leaders in your field. This will allow you to get relevant feedback on your work as you prepare it for publication.
3. Take the feedback you receive on your poster seriously to address any flaws in your design or approach, or to recognize the importance of your work to the field. This feedback may help you anticipate questions reviewers might have about your work as you try to publish it.
4. Network with individuals in your field and related fields at the poster session specifically, and at the meeting in general. If you want people to see your poster, return the courtesy to them.
5. Convert your poster into the first draft of a manuscript soon after your presentation.

Table 2

Questions to pose to a mentor or colleague [adapted from *The academic medicine handbook*.(24)]:

1. Can we identify data that I can present in a poster?
2. Which academic meetings are ideally suited for me to present my research? Who is my primary audience?
3. What kinds of questions will people ask me while I present my poster? What if I do not have the answer?
4. Who should I include on the author list on the poster and in what order?
5. Are there specific posters I should see when I am not presenting my own poster?
6. How can I make the work I present in a poster publishable?