

# From foundations to frontiers: the status and perception of formulation teaching in Canadian English-speaking psychiatry residency programs

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## Summary

**Aim of the study:** Formulation is considered a key competence that should be taught during psychiatry training in residency. The scientific literature indicates shortcomings in teaching this clinical skill such as a lack of standardization and clear guidelines. The main objective of this research was to examine psychiatry residents' perception regarding teaching of formulation in Canadian psychiatry residency programs.

**Subject or material and methods:** All Canadian psychiatry program directors in English programs were emailed a link for the study survey. The survey had a mix of closed and open-ended questions. With the exception of one Program Director, the survey link was distributed by all of the Program Directors. 116/661 (17.5%) of residents completed the survey.

**Results:** Overall, results of this survey indicated that residents did not feel very competent in their formulation skills, although they felt this was an important ability. Residents mostly learn it through individual supervision or through mentoring with a senior resident.

**Discussion:** Residents suggested a more structured approach in teaching formulation, as well as adding a small group format or workshops.

**Conclusions:** This research could provide guidance to educators in developing new curricula in the context of the upcoming transition to the competence-based framework by the Royal College of Physicians and Surgeons of Canada.

## INTRODUCTION

Biopsychosocial formulation is generally accepted as an essential competence to be developed by psychiatrists during their residency training. National organizations proposing guidelines for residency training in psychiatry, such as the Royal College of Physicians and Surgeons

of Canada (RCPSC) and the Accredited Council for Graduate Medical Education (ACGME), have established that formulation is a key ability for residents. According to the RCPSC's objectives of training in psychiatry [1], as a medical expert in psychiatry a resident must "integrate and present a biopsychosocial understanding" and "develop and implement an integrated biopsychosocial treatment plan". Similar expectations are found in the USA, where the ACGME suggests that residents must demonstrate the skill of "formulating an understanding of a patient's biological, psychological, behavioral and sociocultural issues associated with etiology and treatment" [2].

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## DEFINITION AND AIMS

Psychiatric formulation is variably defined, and often the definitions are imprecise. For example, the American Psychiatric Association defines psychiatric formulation as “a prescribed method for the orderly combinations or arrangement of data and treatment recommendations about a psychiatric patient according to some rational principles” [3]. Generally speaking, there are 3 components in a formulation: descriptive, etiological and treatment-prognosis. A formulation should grasp the essence of the case with a theoretical basis, and be sensitive about and specific to the patient [4]. Another definition proposed is “a process of linking together a group of data and information to define a coherent pattern and

it helps to establish diagnosis, provides for explanation and prepares the clinician for therapeutic work and prediction” [5].

Formulation is more than a summary of descriptive information about the patient’s presenting problem leading to a diagnosis. By itself, providing a diagnosis does not complete the process of evaluation [6]. Some authors argue that using only psychiatric diagnosis to guide intervention limits individualized care, while case formulation allows flexibility. The formulation should take into account features of the patient that are not captured by the DSM diagnosis, but should be considered in the treatment plan [7]. Mace & Binyon [8] proposed six readily accepted aims of case formulation (Table 1), although the list may not be all inclusive.

**Table 1.** The aims of psychiatric formulation. Source: Mace & Binyon [8]

To understand and predict how a particular individual responds to being ill.
To understand and predict an individual’s likely responses to treatment.
To summarize psychodynamic factors contributing to current difficulties.
To draw up recommendations for further treatment.
To evaluate the effectiveness of any subsequent psychotherapy.
To guide therapists and supervisors providing psychotherapy.

Case formulation lies at the intersection of etiology and description, theory and practice, and science and art [9]. As Bolton summarizes: “Diagnosis is a label; formulation is a map. It is a map of the extensions and connections of a problem and a map for action” [10].

## FORMULATION – CURRENT STATUS

Several publications on formulation suggest that it remains an under-taught clinical competence in psychiatry residency programs, lacking clear guidelines and standardization [11–13]. McClain et al. [13] identified significant deficits in psychiatry resident formulation skills from 4 institutions using biopsychosocial scores measured by masked trained raters. Their study indicates that residents may be eliciting the necessary information for the development of competent formulations, but lack the ability to synthesize a coherent and succinct formulation [13]. In the same study, residents recognized their weaknesses in biopsychosocial formulations and expressed

their desire for more training in this area, which they viewed as beneficial to patient care [13].

Shortcomings in formulation ability in residency are also likely maintained beyond residency. Eells et al. [14] randomly analyzed selected case formulations from an academic outpatient psychiatry clinic, and found primarily summaries of descriptive information rather than integrated hypotheses about the causes, precipitants and perpetuating factors of patient problems. Also, Abbas et al. [15] found that qualified psychiatrists rarely included case formulations in their outpatient assessment letters. This may indicate that this important clinical skill is rarely translated into every day clinical practice.

## APPROACHES TO SKILLS-BASED FORMULATION TEACHING

Despite the status quo, it has been shown that a variety of different teaching models and methods can indeed improve case formulation skills. Mace & Binyon [8] have outlined 4 levels to aid

in the development of the skill of formulation: recognizing the psychological dimension (difficulties relating to events, reactions and relationships); constructing an illness narrative (story linking past and present); modeling a formulation (structured understanding of causative factors and their interrelatedness); and naming the elements (developing a formulation of the identified dynamics). Eells et al. [16] demonstrated that compared with non-experts, experts generated more forward (or inferential) reasoning in their case formulations, as opposed to backward (or deductive) reasoning. The authors added that to be effective, forward reasoning should be based on a well-developed and rich knowledge foundation, which supports the view that formal didactic teaching likely plays an important role in improving formulation skills [10,17]. Methods of evaluating the quality of formulations have been developed [7,13,18]. They improve our understanding of this core clinical ability and could support educators in designing learning programs.

More specific approaches have also been studied. For example, Abbas et al. [19] showed that when an integrated case formulation approach and a rating scale (the Case Formulation Scale) were used, a group of psychiatrists were able to improve their formulation skills. In the study by McClain et al. [13], investigators concluded that an intervention using resident portfolio entries (as well as masked, trained raters from 4 institutions) improved resident competency in biopsychosocial formulations. Guerrero et al. [20] showed that a single teaching session, focused on the use of mechanistic case diagramming in teaching biopsychosocial-cultural formulation, was helpful in teaching clinical clerks more about this technique. Also, Kendjelic & Eells [21] developed a 2-hour training session in case formulation and compared 20 clinicians who received this training with 23 who did not. Formulations were coded for quality and content. Clinicians in the training group produced formulations that were rated as more elaborate, comprehensive, complex and precise. Overall, these formulations were rated as higher in quality than those produced by the control group.

Anecdotal reports suggest the benefits of structured didactic teaching [9] or the use of commercial movies, where residents have to construct a formulation of the main characters [22]. Specif-

ic interventions with didactic teaching have also been effective in studies using a control group of learners who did not receive educational sessions [13]. In one study, most residents found that portfolio entries were a good tool for demonstrating competency in biopsychosocial formulation [13].

## THE DISCONNECT – RESIDENTS’ PERCEPTIONS

So if there are effective methods of teaching formulation, why are some residents not being taught this important clinical competency? Why is there a disconnect between what can be taught and what is being taught? Here we note a commonly reported concern that we have heard from residents in our program for some time – that they are not being taught this skill. This concern may be anecdotal only, as there is a lack of empirical data on residents’ perspectives in regard to learning case formulation.

To our knowledge, there are no recent data on the status and/or perception of teaching of formulation in psychiatry residency programs in Canada. As the RCPSC is now evolving towards a competency-based medical education (CBME) approach, psychiatry educators across Canada will be challenged in planning new curricula that focus on outcomes and explicit definitions of essential domains of competence. The primary purpose of the current research project was to examine the perceptions of formulation teaching among psychiatry residents in each of the 15 English medical schools in Canada. As current education theory promotes learner-centeredness, where trainees take increasing responsibility for their progress and development, we felt it was important to start with the needs and perceptions of the learners. The results of this study should be useful in assisting educators in developing future curricula in the spirit of CBME.

The first aim of this study was to determine which methods Canadian psychiatry residents used to learn the skill of formulation. More specifically, the study aimed at clarifying whether there were any particular methods the residents believed to be most effective, and which teaching settings they found to be most helpful. The second aim was to determine if residents believed that this skill is important. Residents

were also asked if they are aware of the RCP-SC's training objectives regarding formulation.

## METHOD

Since focus groups were logistically challenging, a survey method was chosen for this study. No similar survey of residents' perception of formulation teaching was available in the literature, therefore assistance was requested from the Medical Education Scholarship Centre (MESC) at X University. A survey was then developed for the purposes of this project. MESC also provided assistance with interpreting data. The purpose of the survey was to focus on the domains of perception on formulation teaching as listed in Table 2 [8], and the survey consisted of 10 items devel-

oped based on these domains. The first two items focused on the participants' current level of training and level of education when first introduced to the concept of the biopsychosocial formulation. Other items asked participants how they were learning the skill of formulation and which strategies they found most helpful in developing the skill. The final item was an open-ended question that asked participants to elaborate on any ideas they had in how the development of the skill of formulation might be better presented to them during their training. This last item contained narrative comments. All other items were analyzed with respect to response count and response percent. For the full series of 10 items and associated responses, please see Table 3. Since this was a pilot project, the survey was not officially validated prior to dissemination.

**Table 2.** Domains of perception on formulation. Source: Mace & Binyon [8]

Importance of formulation
Stage of medical training when first exposed to formulation
Resources used to learn formulation
Strategies used to learn formulation
Teachers involved
Current level of residency
Self-rated proficiency at formulation
Proficiency of teachers in formulation
Presence of mentors in formulation
Awareness of the training objectives from the RCSPC
Ideas on how formulation could be better taught

**Table 3.** Survey questions

Question	Possible responses
1. What is your current level of training?	PGY1, PGY2, PGY 3, PGY4, PGY5
2. When were you introduced to the concept of the biopsychosocial formulation?	Pre-clerkship, clerkship, PGY1, PGY2, PGY 3, PGY4, PGY5
3. How are you learning to accomplish this skill? (Please check all that apply)	Didactic lectures, textbooks, journal articles, video/multimedia, individual supervision, hearing peers formulate, hearing supervisors formulate, small group, workshop, other
4. Which strategies have you found to be most helpful in developing this skill?	Didactic lectures, textbooks, journal articles, video/multimedia, individual supervision, hearing peers formulate, hearing supervisors formulate, small group, workshop, other
5. Who has been involved in helping you to develop this skill? (Select all that apply)	Resident junior to you, resident senior to you, psychiatrist, psychologists
6. Have you had a mentor or teacher who has been particularly helpful in your learning how to prepare a formulation?	Yes or no

7. How important do you believe the ability to formulate an understanding of the patient with psychiatric illness to be?	Very important, somewhat important, neutral, not very important, not at all important
8. How would you describe your present level of confidence in formulating an understanding of the patient?	Very confident, somewhat confident, neutral, not very confident, not at all confident
9. Are you aware of the RCPSC's objectives of training in psychiatry regarding biopsychosocial understanding?	Yes or no
10. Please elaborate on any thought or ideas you may have regarding how development of the skill of formulation might be better presented?	

Ethics approval was obtained through the local health research ethics authority. Email contact was made with the program director of each Canadian psychiatry residency training program. A description of the project and a link to the survey were included. The email requested that each resident consider responding to the survey. A second reminder was sent 4 months after the original email.

## RESULTS

The survey was distributed to all program directors in English programs in Canada. One director did not send the survey out to the resident group. Of the remaining programs, 116/661 res-

idents responded (response rate 17.5%). While there was a fairly even spread across residency years, most respondents were in PGY2 (23.7%). The majority of residents reported that they were first introduced to the concept of psychiatric formulation in the clerkship year (40.9%).

See Table 4 for the responses to how residents were learning the skill of formulation. The most commonly selected response was individual supervision (80%), followed by hearing peers formulate (73.9%), didactic lectures (61.7%) and hearing supervisors formulate (61.7%), and finally, video/multimedia (2.6%). When given these same choices, residents ranked individual supervision as the most helpful method of learning about formulation, followed by hearing supervisors formulate and hearing peers formulate.

**Table 4.** How residents are learning the skill of formulation

Method of learning	Percentage of responders with exposure to method	Rank <sup>a</sup>
Individual supervision	80	1
Hearing peers formulate	73.9	3
Didactic lectures	61.7	4
Hearing supervisors formulate	61.7	2
Small groups	50.4	8
Textbooks	49.6	5
Journal articles	34.8	6
Participating in a workshop	8.7	9
Other	6.1	10
Use of video multimedia	2.6	7

a. 1 – most helpful, 10 – least helpful.

The role of supervision, modeling and mentoring was felt to be important. An overwhelming majority (93.7%) of residents said that a psychiatrist had been involved in helping them devel-

op the skill of formulation. A half (50.5%) of residents said that it was a senior resident but even more (62.2%) indicated that they had a mentor or teacher who was particularly helpful in their

learning. Other professionals (social workers, psychologists, nurses) were sometimes involved in teaching formulation to residents.

While residents believed that formulation was important (68.1% suggested it was very important), only 11.4% were very confident in their present level of skill in formulating. Most (46.5%) were only "somewhat confident". The majority did not know about the formal objectives regarding biopsychosocial understanding of patients. Fifty seven percent of residents were not aware of RCPSC's objectives of training outlined above.

The final question invited the residents to elaborate on any thoughts or ideas they had on how the skill of formulation could be taught better. This question yielded important qualitative data, which deserve further examination. Forty one individual comments were received. Not all of these qualitative data will be reported here, but some important themes emerged from the open-ended questioning. Few comments were positive in nature. One learner spoke of diverse methods of formulation teaching which catered to a diversity of learning styles. Several others spoke of positive learning experiences with individual supervisors who employed specific approaches, for example choosing a central theme from the patient's presentation and formulating around that theme.

The most prominent theme was that residents found small group teaching (e.g. workshops) the most useful way to learn the skill of formulation. It was in this setting that residents felt "safe" formulating. The use of cases was also felt to be very important in the workshop setting. The next most common theme was that residents needed to hear supervisors formulate patients. While some preferred listening to an "expert" formulate a case, others were satisfied listening to any staff psychiatrist or even a senior resident formulate a patient. One comment suggested that a regular formulation workshop (with examples provided by staff) be held at the annual Canadian Psychiatric Association meeting.

The next most common themes were the need for structured formal teaching with a systematic approach and more practice in clinical rotations. Interestingly, residents felt that it was important that the staff psychiatrist expects them to formulate in the various clinical settings. Otherwise, there would be no onus on them to provide for-

mulations in these settings and they would lose out on valuable practice.

Residents felt that exposure to formulation teaching should occur early in residency and that it needed to be repeated at a regular frequency. One resident felt that there should be less focus on psychodynamic "jargon" and one commented that "formulation templates" need to be introduced earlier on in training.

## DISCUSSION

This study demonstrates that although Canadian psychiatry residents consider case formulation important, they do not feel very competent in the clinical ability. The development of formulation skills in the surveyed residents appears to rely mostly on individual supervision. Although this method is highly valued by learners, it does not guarantee that all residents will receive sufficient exposure to such supervision during their residency. Some clinician educators might feel less comfortable with their formulation skills, and therefore less likely to encourage practice in their trainees. Formulation has been described as having a longstanding status as "part of the clinical lore passed on" [23] to trainees during one-to-one supervision and in case conferences, but recent literature suggests the benefits of more structured approaches to teaching. McClain et al. [13] showed the positive impact of implementing an intervention in a residency program that involved grand rounds discussion and meeting with faculty and residents to discuss the importance of formulation.

Psychiatry residents surveyed in this study appear to be calling for a more systematic and diversified approach to teaching case formulation. Besides individual supervision, they seem to value and appreciate small group learning and workshops. At the same time, residents value teaching that is anchored in clinical work, such as with rotation supervisors who expect them to practice case formulation. The latter has important implications for educators who are planning new curricula based on CBME. In the new competency-based framework proposed by the RCPSC [24] competencies will not only have to be demonstrated and observed in the workplace, but educators will have to develop formative

and summative assessment tools (e.g. encounter cards, portfolios, multi-source feedback). To our knowledge, there is currently no common assessment tool for psychiatry residents that explicitly defines milestones along the development of the competence of case formulation. The development and validation of such an instrument seems necessary for several reasons. First of all, it would provide guidance on how best to assist trainees to improve their formulation skills. For trainees, it would help in getting structured feedback on their performance, and would provide clear indications on how to reach the next milestone. A common validated tool would also allow residency programs to identify strengths and weaknesses in their curricula.

The fact that didactic teaching came only third as a method through which residents acquire formulation skills might partially explain why residents do not feel very competent. The presence of inferential reasoning which characterizes a good level of expertise in formulation requires a solid knowledge base [16]. Psychiatric formulation is an example of how a learner evolves through the six levels of thinking in Bloom's taxonomy pyramid (remembering, understanding, applying, analyzing, evaluating and creating) [25]. This evolution should be evident as the psychiatric resident moves through a 4 – (or 5-)year training program. Psychiatric educators should consider incorporating specific didactic lectures on formulation in the curriculum, in parallel with clinical interviews where the residents practice the skill of formulation. As the RCPSC defines it, a competence is a "broad series of outcomes or abilities that integrate knowledge, skills and behaviors in practice for a specific context" [24].

There is a close relationship between interviewing skills and formulation, meaning improving competence in one area invariably facilitates improvement in the other [26]. Residency programs should therefore pay attention to the experiential aspect in learners, particularly in relationship to patients during live interviews. It is generally accepted that to achieve a deep understanding of a patient, a clinician must have sufficient empathy and be able to identify and resist potential negative counter-transference responses harming a therapeutic alliance. Teaching of formulation skills could be enriched if it involved live interviews with patients and opportunities to dis-

cuss transference, resistance and counter-transference issues. Besides interview skills, using video material could be beneficial in evoking emotional responses in trainees and in developing competency in using counter-transference [26]. It is therefore surprising that only 2.6% of residents in this survey mentioned using video/multimedia as a method to improve formulation ability.

## LIMITATIONS

This study has notable limitations. First of all, there was a low response rate of 17.5%. While it is not uncommon for an external survey to have such a low response rate, it does limit the generalizability of our findings to the population of psychiatric residents at large. It is possible that sending out multiple email reminders to complete the survey (perhaps at one month and four months) could have improved the response rate. It is also possible that an incentive (e.g. eligibility for a draw for a gift card) could have improved it. Also, although this study examined residents' perception in learning about formulation, it does not inform on the actual content and teaching approaches in different residency programs in Canada. As a consequence, it is not possible from the data to identify strengths and weaknesses of specific residency programs in Canada. A study looking at actual curriculum content and teaching practices in relationship to residents' assessment of their formulation skills would be ideal to inform development of future training programs.

Psychiatry residents who responded to this survey were possibly biased in certain aspects. Those who responded may consider formulation more important than those who did not respond. They might also be the ones who felt less competent with their formulation and were more dissatisfied and critical of training programs.

Also, the brevity of the survey (10 items) means that the depth and breadth of information gained was somewhat limited. The lack of survey validation was also a limitation. Also, the data were not teased out to show the differences in perspectives across training years. Therefore, these findings should not be perceived as uniform across training years as there may have been subtle differences within each training year cohort. Finally, the survey was not conducted with psychiatry resi-

dents from Francophone universities. With educators trained in France or other French-speaking countries, it is possible that residents from those programs regard formulation differently.

## CONCLUSIONS

Formulation is an important skill for psychiatrists that should be taught in residency programs. The scientific literature supports various frameworks to teach this competency. But despite this evidence base, there is a paucity in the amount and diversity of structured teaching that residents actually receive. This study demonstrated that Canadian residents may not feel very competent in their ability to formulate, but they do have useful insights into how to improve the teaching experience. With the upcoming transition to CBME in psychiatry, educators should design and develop new curricula with these resident needs and perceptions in mind.

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