Wake Forest University
School of Medicine

Atrium Health Wake Forest Baptist Comprehensive Cancer Center
Qualitative and Patient Reported Outcomes (Q-PRO) Shared Resource

Saturation in Qualitative Research

What is saturation?

Saturation refers to the point at which sufficient data have been collected to draw conclusions, and additional data collection will yield little to no additions.[1] It is widely considered to be an important indicator of quality in qualitative research.[2,3,4,5]

The concept of saturation originally comes from grounded theory research, where it emphasizes the adequacy of data to support the development and credibility of theory.[6]

Saturation is also used more generally in qualitative research to determine the appropriate sample size for a project, and to add rigor to the analysis. For non-grounded theory research using a thematic analysis approach, saturation is defined in one of several ways:

- Data Saturation: The point at which new data repeat what was expressed in previous data.[5]
- Thematic Saturation: The point at which further data collection and analysis identify no new themes in the data.[7]
- Code Saturation: The point at which no new relevant codes or ideas are found in the data and the codebook has stabilized.[8]
- Meaning Saturation: The point at which we fully understand the issues identified in the data and no further insights or nuances are found.[8]

What are the limitations of saturation?

The point at which saturation is achieved depends on the heterogeneity of the sample, the quality of your data and your data collection processes (e.g. having trained interviewers who fully explored all topics with participants), the design of your data collection tool, as well as your approach to coding (e.g. inductive vs. deductive).

For example, a project with highly structured interview guide and a deductive coding approach, in which codes are derived directly from the interview questions, is likely to achieve saturation within a few interviews, while a project using a loosely structured interview guide and an inductive coding approach may not achieve saturation until closer to n=20 interviews.

Importantly, achieving saturation within a few interviews or focus groups does not denote the quality of the project, and a project that does not achieve saturation until more data collection events are completed is not lower in quality. The important thing is that saturation is achieved at some point within the dataset, indicating confidence in the ability to draw conclusions from the sample.

How and when do I address saturation in my qualitative project?

(1) Study Design: Consider saturation when you are estimating the sample size for your qualitative project, and mention saturation in the methods section of your grant proposal as a rigor step (see suggested grant language at the bottom of this page).
   - A recent systematic review found that saturation is typically achieved between 9-17 interviews and 4-8 focus groups.[9] Even so, many journals and reviewers still show a preference for studies with sample sizes of n=20 or more and may be critical of studies will smaller sample sizes, so keep this in mind when determining your sample size. Additionally, if you plan to stratify your sample in order to look at differences between subgroups of participants, you should aim to reach saturation of data within each group.

(2) Data Collection and Analysis: If you are able to analyze your data as it is collected, you can use saturation as a basis for determining when to end data collection. You can also assess saturation once you have completed data collection as a step to add rigor to your analysis.
   - If Q-PRO is involved in data analysis for your project (regardless of whether we are involved in data collection or not) we will assess and report back to you on saturation as part of our analytic methods. We are not able to accommodate concurrent data collection and analysis, so we will report back to you about saturation once initial data collection is complete.
   - Q-PRO can also mentor you about determining saturation, so that you can determine saturation while your data collection is ongoing, or after data collection is complete.

(3) Dissemination: Authors frequently write that they “sampled to saturation,” or “achieved thematic saturation,” in their manuscripts, with little additional detail. A best practice is to include a description of your approach to determining saturation, for transparency. It is not necessary to report the exact point at which saturation was achieved, however you may do this if you choose.

Suggested Grant Language:

Interviews	Qualitative interviews will be conducted with an estimated X participants, consistent with previous research that has found than n=9-17 interviews are sufficient to obtain saturation (e.g. subsequent interviews do not generate new findings) (Hennik & Kaiser, 2022[9]). Additional interviews will be conducted as necessary until saturation is reached.
Focus Groups	X focus groups will be conducted, consistent with previous research that has found that n=4-8 focus groups are sufficient to obtain saturation (e.g. subsequent focus groups do not generate new findings) (Hennik & Kaiser, 2022[9]). Additional focus groups will be conducted as necessary until saturation is reached.

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[3] Francis JJ, Johnston M, Robertson C, et al. What is an adequate sample size? Operationalising data saturation for theory-based interview studies. *Psychol Health*. 2010;25(10):1229-1245.
[4] Morse JM. "Data Were Saturated . . . ." *Qualitative Health Research*. 2015;25(5):587-588.
[5] Saunders B, Sim J, Kingstone T, Baker S, Waterfield J, Bartlam B, Burroughs H, Jinks C. Saturation in qualitative research: exploring its conceptualization and operationalization. Qual Quant. 2018; 52:1893-1907.
[6] Glaser BG & Strauss AL. (1967). The Discovery of Grounded Theory. Strategies for Qualitative Research. Chicago: Aldine.
[7] Green J & Thorogood N. (2004) Qualitative methods for health research (2nd ed., pp. 198-202). London: Sage Publications
[8] Hennik MM, Kaiser BN, Marconi VC. Code Saturation Versus Meaning Saturation: How Many Interviews Are Enough?. *Qual Health Res*. 2017;27(4):591-608.
[9] Hennik M, Kaiser BN. Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Soc Sci Med*. 2022;292:114523.