



Snowball Sampling: A Purposeful Method of Sampling in Qualitative Research

Mahin Naderifar,¹ Hamideh Goli,² and Fereshteh Ghaljaie^{3,*}

¹Department of Nursing, Faculty of Nursing and Midwifery, Zabol University of Medical Sciences, Zabol, IR Iran

²Department of Nursing, Faculty of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran

³Community Nursing Research Center, Faculty of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran

*Corresponding author: Fereshteh Ghaljaie, Community Nursing Research Center, Faculty of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran. E-mail: ghaljaie_f@yahoo.com

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Abstract

Background and Objectives: Snowball sampling is applied when samples with the target characteristics are not easily accessible. This research describes snowball sampling as a purposeful method of data collection in qualitative research.

Methods: This paper is a descriptive review of previous research papers. Data were gathered using English keywords, including “review,” “declaration,” “snowball,” and “chain referral,” as well as Persian keywords that are equivalents of the following: “purposeful sampling,” “snowball,” “qualitative research,” and “descriptive review.” The databases included Google Scholar, Scopus, Irandoc, ProQuest, Science Direct, SID, MagIran, Medline, and Cochrane. The search was limited to Persian and English articles written between 2005 and 2013.

Results: The preliminary search yielded 433 articles from PubMed, 88 articles from Scopus, 1 article from SID, and 18 articles from MagIran. Among 125 articles, methodological and non-research articles were omitted. Finally, 11 relevant articles, which met the criteria, were selected for review.

Conclusions: Different methods of snowball sampling can be applied to facilitate scientific research, provide community-based data, and hold health educational programs. Snowball sampling can be effectively used to analyze vulnerable groups or individuals under special care. In fact, it allows researchers to access susceptible populations. Thus, it is suggested to consider snowball sampling strategies while working with the attendees of educational programs or samples of research studies.

Keywords: Purposeful Sampling, Snowball, Qualitative Research, Descriptive Review

1. Background

Qualitative research is an organized method of describing people’s experiences and internal feelings (1). It can be said that qualitative research provides a thorough and deep overview of a phenomenon through data collection and presents a rich description using a flexible method of research. In this method, qualitative information, which is gathered in the form of non-numerical data, is presented (2).

There are different methods to collect the required data, including interviews, observations, focus groups, narratives, notes, reports, and review of archives. The researcher chooses the information with respect to the questions, sensitivity of the subject, research samples, and availability of resources (3). To determine the characteristics of a community, it is possible to gather data by sampling or census reports.

Sampling is the process of choosing a part of the popu-

lation to represent the whole. If the researcher considers a part of the population as a representation of the whole, the analysis will be more comprehensive (4). In many research studies, factors such as lack of human resources, lack of precision, high expenses, inadequate equipment, and population dispersion prevent researchers from studying the entire population. In this case, it is preferable to study only a part of the population (5).

Researchers should plan the sampling process and determine the method of study. Sampling is performed in two general ways: probability and nonprobability. In probability sampling methods, the rules of probability are applied, and as their main feature, each sample has a chance to be selected. In these methods, the researcher’s opinion or community members do not influence the selection of samples. The selected sample is a representative of the population, and the researcher can generalize the findings to the whole population. Probability sampling methods include simple random sampling, systematic sampling,

stratified sampling, and cluster sampling.

On the other hand, nonprobability methods of sampling involve samples that are available to the researcher or are selected by the researcher. In these methods, not everyone has an equal chance of being selected, and it is not clear who will be included in the final sample. Regarding the sampling method, generalization of the findings to the entire population is not clear either, and one cannot calculate the rate of error in the sampling. Different methods of nonprobability sampling include convenience, purposeful, and quota sampling. In quantitative research, probability sampling is normally applied, whereas in qualitative research, nonprobability sampling is selected (1).

The convenience sampling method includes members of the population who are available to the researcher. For instance, a lecturer who distributes questionnaires among students has in fact used this method. Asking questions from passers-by on the street is another example of this method of sampling. This method is also called "accidental sampling" (1). Snowball sampling is a convenience sampling method. This method is applied when it is difficult to access subjects with the target characteristics. In this method, the existing study subjects recruit future subjects among their acquaintances. Sampling continues until data saturation (6).

As stated by Polit-O'Hara and Beck, this method, which is also called the "chain method," is efficient and cost-effective to access people who would otherwise be very difficult to find. In this method, the researcher asks the first few samples, who are usually selected via convenience sampling, if they know anyone with similar views or situations to take part in the research. The snowball method not only takes little time but also provides the researcher with the opportunity to communicate better with the samples, as they are acquaintances of the first sample, and the first sample is linked to the researcher (7). This type of networking is particularly useful for finding people who are not willing to reveal their identities (e.g., addicts and criminals) (4).

In another definition, snowball sampling may be less reliant on a reference sample, but it is still suitable to find unattainable populations. For example, when the research is aimed at a group of illegal immigrants or addicts, meeting the first group of samples will probably lead to other samples; thus, the study sample grows like a rolling snowball (5).

Generally, snowball sampling is a gradual process, and time influences the selection of samples. Sampling usually continues until data saturation. On the other hand, convenience sampling is the weakest method of sampling. The risk of bias is low when the population is homogeneous in terms of the target characteristic under question,

whereas in nonhomogeneous populations, this method of sampling has a higher risk of error (1).

In recent decades, qualitative research has become more popular in nursing studies. Despite the growing body of qualitative research in the past few decades, there have been debates about these types of studies due to lack of detailed information on the methods and processes. Most published qualitative papers do not provide enough information about the characteristics of the samples, research, and sampling methods. In qualitative research, sampling is determined by the type of research, while most published literature has not determined the type of research (8).

Consecutive sampling is one method of purposeful sampling in qualitative research. In this method, instead of selecting a fixed sample, every subject who meets the criteria is selected until the required sample size is achieved. This method is classified into three types, one of which is snowball sampling. This type of sampling is a nonprobability method, which involves random selection of subjects. This method is most effective when the members of the population are not easily accessible (e.g., homeless people, illegal immigrants, and addicts). The researcher first identifies a group of people, and after gathering data, he/she asks them to recommend similar cases for the study.

The purpose of qualitative research is to gain a deeper understanding of a phenomenon, rather than to generalizing the findings. Therefore, careful selection of research samples can help us conduct a more thorough evaluation. The purpose of this study was to review the available qualitative research in nursing, which applied the snowball sampling method.

2. Methods

This research is a thorough and descriptive review of the snowball sampling method, based on articles published in national and international journals, as well as dissertations. The articles were selected from Cochrane, ProQuest, Science Direct, SID, MagIran, Medline, Irandoc, Scopus, and Google Scholar databases in both Persian and English languages between 2005 and 2013. Data were gathered using English keywords, including "review," "declaration," "snowball," and "chain referral," as well as Persian keywords that are equivalents of the following: "purposeful sampling," "snowball," "qualitative research," and "descriptive review."

First, all articles related to qualitative research in Iran were gathered. The articles, which contained the aforementioned keywords in the abstract, were included in our preliminary list, while the rest of the articles were discarded. Then, a checklist was used to document all the

required information, including the title, location, time, scope, and method of sampling; this checklist was used for the final evaluation. Two individuals separately searched and gathered the data.

3. Results

In the preliminary search, 423 articles from PubMed, 88 articles from Scopus, 1 article from SID, and 18 articles from MagIran were selected. Dissertations approved between 2005 and 2013 were also reviewed. After limiting the search to articles with full text, the total number of the articles reached 125. In addition, dissertations that were not available to the researchers were eliminated.

The remaining articles were reviewed, and those with a theoretical framework, as well as non-research articles, were omitted. Finally, 11 articles were found eligible for the review and were selected for their relevance to the purpose of this study. The methods and content of these papers were thoroughly reviewed to determine the characteristics of snowball sampling and methods of implementation (Table 1).

4. Discussion and Conclusions

One main challenge of qualitative research is selecting the samples, determining the sufficient sample size, and explaining the sampling procedure. Although many qualitative research experts believe that data saturation is a subjective phenomenon, there is also the view that more observations and interviews do not affect the interpretation of the results.

Review of the literature showed that a few research studies have accurately explained the snowball sampling method. In most of them, the main method of sampling was sufficient, and they have not presented clear explanations about its implementation. On the other hand, in some studies, the snowball sampling method did not suffice and was only used to complete the data. It should be mentioned that the snowball sampling method is fully explained in only one study, which has fully clarified its different aspects.

Different variations of snowball sampling can be applied in the development of community-based information, dissemination efforts related to health education programs, and research studies. These methods can be effectively used to choose samples from fragile populations or people under specialized care. Adaptation of the snowball sampling method helps researchers gain access to the target population.

Adaptations of snowball sampling strategies should be considered when recruiting participants for educational

programs or research studies. In snowball sampling, the fragile population is selected in a social context and in a multi-stage process. After gaining access to the preliminary samples, the samples begin to introduce other people to take part in the research. This process will continue in a semi-automatic and chain-like manner until data saturation (9).

Nurses have different responsibilities, including clinical care, education, and research. In many cases, it is difficult to identify or contact care-seekers. Human immunodeficiency virus (HIV) positive patients, abused women, drug addicts, sex workers, and people with homosexual or asexual tendencies are examples of these fragile populations (10). The snowball sampling method has been derived from different concepts of social marketing. However, people who are involved in research studies and have educational opportunities should always consider individual rights and privacy.

Snowball sampling is a method of gathering information to access specific groups of people. The advantages and limitations of this research method should be evaluated to select the best strategy. A researcher aiming to perform health interventions should consider people's privacy concerns (both for preliminary samples and samples in the target community). Additionally, anonymity and confidentiality of the data should be guaranteed by the researcher (11).

The limitations of this study, which are mostly related to its design (review study), include lack of homogeneity in the measurement methods and lack of explanation about the exact sampling method in most papers. Researchers interested in qualitative research are recommended to choose a method of sampling that is not only more accurate but also saves time and money.

Supplementary Material

Supplementary material(s) is available [here](#) [To read supplementary materials, please refer to the journal website and open PDF/HTML].

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Table 1. General Data Gathered from the Selected Articles on the Snowball Sampling Method

Reference	Title	Data Collection Method	Findings
Walsh et al. (12)	Attitudes and subjective norms: Determinants of parents' intentions to reduce childhood fever with medications	Three methods: newspaper advertisement, face-to-face interview, and snowball sampling	The snowball method was implemented by a network of researchers and respondents. All the attendees were given a package containing an introduction letter, information overview sheet, questionnaire, and return envelope. After completing the forms, the information was collected.
Charkazi et al. (13)	Explaining smoking among students at Golestan University of Medical Sciences based on BASNEF model	Snowball sampling (The researcher identified some smoking students, and after explaining the purpose of the study and obtaining oral consent, they were asked to introduce some other smoker students to recruit a larger sample.)	Abstract norms and enabling factors are among the most important factors in smoking. Therefore, these points should be considered for preventing and organizing recovery programs.
Heshmati Nabavi et al. (14)	Barrier to forming and implementing academic service partnership in nursing: A qualitative study	Purposeful sampling, snowball sampling, and interview (First, purposeful sampling was applied, and then more samples were identified using the snowball method. This process continued until data saturation.)	The identified themes were "organizational divergence," "invisible wall," and "overemphasis on theoretical knowledge." The most important barriers impeding cooperation between educational and clinical institutes are ambiguities in the organizational structure of institutes, responsibilities of employees of each institute in relation to others, overemphasis on theoretical knowledge, and ignoring of practical knowledge and clinical performance of nurses. Development of academic service partnership can be facilitated by defining a formal organizational relationship between academic and service institutes, clarifying roles and responsibilities of each institute regarding clinical education, defining clinical practice roles for nursing faculty members, and emphasizing the importance of nursing clinical practice.
Swallow et al. (15)	Pan-Britain, mixed-methods study of multidisciplinary teams teaching parents to manage children's long-term kidney conditions at home: Study protocol	Purposeful sampling was applied considering the child's age, diagnosis, ethnicity, and need for clinical care. Snowball sampling was implemented to identify staff members who were involved in the care of the child.	It is essential to educate the parents on long-term care for children at home. It is also essential to understand that parents of children with chronic renal diseases need to receive specialized education.
Sasson et al. (16)	A qualitative study to identify barriers to local implementation of pre-hospital termination of resuscitation protocols	First, a focus group was determined, and then using snowball sampling, more samples entered the study. Emergency room doctors, paramedics, emergency room authorities, and nurses were also invited.	A method Focus group was used instead of a response package to have a better understanding of how emergency systems manage resuscitation protocols and which practical factors impede the implementation of resuscitation protocols.
Zaghloul and Alsokair (17)	Constructing a nurse appraisal form: A Delphi technique study	Delphi technique and snowball sampling method	A standardized nurse appraisal form was designed and implemented in the hospitals of the eastern states of Saudi Arabia, which are covered by health organizations. The nurses' ideas about the appraisal form were used to determine different aspects of a nurse's performance. In each hospital, the first head nurse was introduced to other head nurses to participate in the study. This process continued until enough head nurses and supervisors were recruited.

Zareipour et al. (18)	Effective factors on smoking based on BASNEF model in male students in Tehran Medical Sciences University in 2009	Snowball sampling method (The researcher met a smoking person, and after attaining oral consent, he was asked to complete a questionnaire. Then, he was asked to invite other smoker friends to take part in the study. The researcher recruited the samples and collected the questionnaires.)	Based on this model, the importance of normative, enabling, and observational factors in smoking behaviors was determined, and the need for authorities' attention was highlighted. Improvement of social and life skills, including resistance against peer pressure (saying "no"), and of the sense of responsibility and self-confidence in the youth can be effective. The youth smoke out of fear of humiliation and shame. However, through building confidence, they can influence their peers.
Lagu et al. (19)	Content of weblogs written by health professionals	Modified snowball sampling method	The domain and content of medical weblogs were reviewed to determine how much the writer of these posts had revealed facts about the patient, breached the doctor-patient confidentiality, or outlined the shortcomings of care for the patient. The researchers defined medical weblogs as web pages, which have medical content and are written by healthcare professionals. Weblogs are a developing part of the medical profession's public face. In these weblogs, doctors and nurses can share their opinions. However, they can also jeopardize their career by revealing confidential information in their content.
Schreiber and MacDonald (20)	Keeping vigil over the profession: A grounded theory of the context of nurse anesthesia practice	Purposeful and snowball sampling methods	Management of registered anesthesia nurses in different cultural-political backgrounds of patient care was studied. The grounded theory was used to observe the performance of registered and certified anesthetic nurses. The grounded theory was used to find procedures in different social backgrounds. The grounded theory was used since the researchers were interested to show the process using which the nurses performed their role.
Mishima et al. (21)	Assistance in family health from the perspective of users	Snowball sampling method (chain sampling) according to the location of the original interviewed group that met the inclusion criteria	Family health services were evaluated from the perspective of clients in San Paolo and Riviera Porto, Brazil, in a wide range of primary healthcare services and specialized care services at different levels.
Cataldo and Malone (22)	False promises: The tobacco industry, "low-tar" cigarettes, and older smokers	Snowball sampling	The role of tobacco industries in marketing and damage from tobacco addiction were assessed among old smokers and infants. The researcher sought to find documents from the tobacco industry, which was unsuccessful.
Sadler et al. (9)	Recruiting hard-to-reach United States population sub-groups via adaptations of snowball sampling strategy	Snowball sampling to recruit subgroups that were not easily accessible	Variations of the snowball sampling strategy can be applied in the development of community-based information, health education programs, and research studies. This strategy is effective in enlisting the involvement of members from vulnerable populations. These strategies find individuals, who have the desired characteristics, and use that person's social networks to recruit similar subjects in a multi-stage process. This semi-automatic process continues until enough samples have been recruited.