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Convenience and Purposive Sampling Techniques: Are they the Same?

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ABSTRACT
This study reviewed the differences and similarities between convenience and purposive sampling techniques. The review has shown that convenience and purposive sampling techniques are not the same, although they share some similarities. Both are nonprobability sampling techniques (grossly subjective sampling techniques), limited in external validity, and saddled with sampling biases. But while purposive sampling selects sample members from well-defined criteria based on researcher's expertise and knowledge, convenience sampling chooses its sample members based on proximity to the researcher. Further, convenience sampling can be used in both qualitative and quantitative study, but purposive sampling is typically used qualitative study. Based on the findings of the study, it is recommended that both convenience and purposive sampling techniques should not be recommended for research due to their high probability of sampling errors and lack of representation of the population; when the target population is small and easily accessible, convenience sampling should be employed for sample selection; and purposive sampling technique should be used when the study focusses on special and sensitive skills, behaviour, attributes, or personalities.
Keywords: Convenience, population, purposive, sample, sampling

INTRODUCTION

Research is the systematic search for knowledge which involves the collection of data, organisation and analysis of the collected data, interpretation of the analysis, and conclusion therefrom. It is a creative search to increase a body of knowledge to provide solution to problems of man and his environment. It is a systematic inquiry to describe, explain, predict, and control the observed phenomenon (Babbie, 2002). Research is a process of steps used to collect and analyse information to increase our understanding of a topic or issue: It consists of three steps - pose a question, collect data to answer the question, and present an answer to the question (Creswell, 2009).

Researches are conducted to handle new problem areas that have not been explored before, or to expand knowledge on current issues through a process of data collection, analysis and interpretation for the purpose of describing, explaining, or validating existing findings, or to understand the impact of specific changes on existing procedures. Thus, every research is carried out on some population. The population of a study consists of all humans, animals, insects, birds, or objects that share common characteristics that a researcher wants to study (Obilor, 2018). In research, a population does not always refer to human beings; it could be anything other than humans, such as objects, events, organizations, countries, species, and many more which have common characteristics that a study is carried out on.

A study population can be very broad or quite narrow. For instance, a researcher may wish to make inferences about the entire secondary school students in Nigeria (broad), or he may wish to study secondary school students in Port Harcourt Metropolis (narrow). When the population is very large and it

is very difficult, or too expensive, or time-consuming to access the entire population, a representative portion of the population called a sample is used.

Sample

A sample is the specific group that a researcher collects data from. The sample of a study consists of a representative part of all humans, animals, insects, birds, or objects that form the population of the study – it is a subset of the population of the study (Obilor, 2018). A sample is simply a subset of the population. The sample must be representative of the population from which it was drawn and it must have good size to warrant statistical analysis. The main purposes of a sample are to increase accessibility to the population, reduce cost, and save time to allow researchers conduct studies on subjects from the population so that the results of their study can be used to derive conclusions that will apply to the entire population. For good quality studies, researchers rely on samples and sampling techniques.

Sampling

Sampling is the act, process, or technique of selecting a suitable sample, or a representative part of a population for the purpose of determining parameters or characteristics of the whole population. Sampling is the statistical process of selecting a subset of a population of interest for purposes of making observations and statistical inferences about that population (Etikan, Musa & Alkassim, 2016). The sampling process comprises of several stages which are defining the target population; choosing the unit of analysis (persons, group, organization, country, objects, or any other entity of interest to the researcher upon which statistical inferences would be drawn); choosing a sampling frame (the accessible population); and finally, selecting a sample from the sampling frame using a well-defined sampling technique. Sampling techniques can be grouped into two broad categories: probability (random) sampling and nonprobability sampling techniques.

Probability Sampling Technique

Probability sampling is a technique in which every unit in the population has a chance (non-zero probability) of being selected in the sample, and this chance can be accurately determined. Sample statistics thus produced, such as sample mean or standard deviation, are unbiased estimates of population parameters, as long as the sampled units are weighted according to their probability of selection. All probability sampling techniques have two attributes in common: (1) every unit in the population has a known non-zero probability of being sampled, and (2) the sampling procedure involves random selection at some point. The different types of probability sampling techniques are discussed below:

(i) Simple Random Sampling

Simple random sampling is a probability sampling technique that ensures that every individual, event, object, or thing in the population has equal chance of being selected for the study (Nzeneri, 2010). It is an unbiased surveying technique that generates a sample that ensures for generalisations about the population. How is the simple random sampling done? The first step is to have a defined population (say a population of 150,000 final year students of Rivers State University). Next, specify a sample size using the Taro Yamane's Sample Size Formula or the Fluid Survey Sample Size Calculator and at 5% level of significance. Let the sample size be 384 students. The third step is to write down the names of every member of the population and put them in a bag. Then draw 384 names randomly from the bag. The result is an unbiased sample that is a genuine representative of the population. This is simple random sampling.

(ii) Stratified Random Sampling

Stratified random sampling is another probability sampling method that involves the division of a population into smaller groups called strata (singular is stratum) and simple random sampling applied in each stratum. The members of each stratum have similar attributes and/or characteristics such as sex, age, education, occupation, location, economic status, political leaning, religion, ethnicity or race, colour, language, profession, etc. This is done to minimise sample selection bias and ensure that certain segments of the population are not overrepresented or underrepresented in the selected sample.

(iii) Systematic Random Sampling

This is also a probability sampling method in which members from a large population are selected according to a random starting point, and a fixed periodic interval. Systematic sampling is similar to simple random sampling, but it is usually slightly easier to conduct. Every member of the population is listed with a number, but instead of randomly generating numbers, individuals are chosen at regular intervals. This interval, called the sampling interval, is calculated by dividing the population size into the desired sample size. Systematic random sampling is a modified simple random sampling involving the selection of sample members from a population list in a systematic order (Ofo, 1999). How is the systematic sampling done? First define and list (assigning numbers to) the population, say 150000 final year students of Rivers State University. Second, choose a sample size, say 150 students. Next calculate the sampling interval, in this case 1000 (obtained by dividing 150000 by 150). Finally, select the first unit randomly and subsequent units are selected at fixed intervals of 1000.

(iv) Cluster Sampling (Area Sampling)

In cluster sampling, a probability sampling method, the population is divided into smaller intact groups called clusters with similar characteristics and simple random sampling carried out in these clusters. According to Nzeneri (2010), in cluster sampling, the population is considered in terms of geographical groupings: rural and urban; upland and riverine; and schools and lesson halls. Other groupings include markets, hospitals, communities, states, and zones. It is important that each cluster is a small-scale representation of the population, and clusters should be mutually exclusive and collectively exhaustive. The main motivation in cluster sampling is cost reduction while increasing sampling efficiency. The major difference between cluster sampling and stratified sampling is that in stratified sampling, random sample is drawn from each of the strata, whereas in cluster sampling only the selected clusters are sampled.

(v) Multistage Sampling

This is a probability sampling technique which can be said to be repeated cluster sampling. It is a sampling programme in which sampling is carried out in stages using smaller and yet smaller sampling units at each stage. How is the multistage sampling done? First, define the population. Next, obtain a large sample, then from this first sample obtain a second sample (smaller from the first), go on to the third sample which is smaller than the second, and so on until the required sample size is gotten.

If it is practically possible, you might include every individual from each sampled cluster. If the clusters themselves are large, you can also sample individuals from within each cluster using one of the techniques above. This is called multistage sampling. This method is good for dealing with large and dispersed populations, but there is more risk of error in the sample, as there could be substantial differences between clusters. It is difficult to guarantee that the sampled clusters are really representative of the whole population.

Nonprobability Sampling Technique

The nonprobability sampling techniques use the researcher's preference regarding sample selection. This sampling method derives primarily from the researcher's ability to access the sample of the study. Nonprobability sampling techniques are sampling techniques in which some units of the population have zero chance of selection or where the probability of selection cannot be accurately determined. Typically, units are selected based on certain non-random criteria. Because selection is non-random, nonprobability sampling does not allow the estimation of sampling errors. This type of method is easier and cheaper to access, but it has a big risk of sampling bias. That means the inferences made about the population are weaker than with probability samples, and conclusions may be a lot limited. Therefore, information from a nonprobability sample cannot be generalized to the entire population. Nonprobability sampling techniques are discussed below:

(i) Quota Sampling

Quota sampling is a non-probability sampling technique that ensures that a representative proportion, of individuals, objects, or things as the entire population with respect to known characteristics or traits, is selected as sample. The characteristics or traits may be sex, age, income, occupation, profession, religion, or political affiliation. How is quota sampling done? First, the population is segmented into mutually

exclusive sub-groups with identified characteristics or traits. Next, samples are selected proportionally from the population based on the population of each sub-group. Imagine that a sample of 120 persons is to be selected from a population 600 persons comprising of 240 Christians, 280 Muslims, and 80 ECKists. Using the quota sampling technique, we shall have sample of 48 Christians, 56 Muslims, and 16 ECKists. The quotas for the various religions are obtain thus: Christians = (240 divided by 600) multiplied by 120; Muslims = (280 divided by 600) multiplied by 120; and ECKists = (80 divided by 600) multiplied by 120.

(ii) Snowball Sampling

Snowball sampling is a non-probability sampling technique where existing study subjects recruit future subjects from among their colleagues, friends, or acquaintances. It is a technique whereby the researcher identifies and selects available respondents who meet the criteria for inclusion in his study. After data has been collected from the respondents, the researcher asks for referrals of other individuals from the already selected respondents, who would also meet the criteria and represent the population of concern. As the sample grows with time, the sample is said to grow like a rolling snowball (thus the name of the sampling technique).

If the population is hard to access, snowball sampling can be used to recruit participants via other participants. The number of people you have access to "snowballs" as you get in contact with more people through them.

Example: Snowball sampling: You are researching experiences of homelessness in your city. Since there is no list of all homeless people in the city, probability sampling isn't possible. You meet one person who agrees to participate in the research, and she puts you in contact with other homeless people that she knows in the area.

(iii) Purposive Sampling

Purposive sampling is a non-probability sampling technique where the researcher selects only those subjects that satisfy the objectives of the study based on the researcher's conviction. It is a sampling technique where the researcher relies on his discretion to choose participants from the study population. Thus, the entire sampling process depends on the researcher's judgment and knowledge of the context. Purposive sampling is also known as subjective or judgement sampling. It is often used in qualitative research, where the researcher wants to gain detailed knowledge about a specific phenomenon rather than make statistical inferences, or where the population is very small and specific. An effective purposive sample must have clear criteria and rationale for inclusion. If done right, purposive sampling helps the researcher filter out irrelevant responses that do not fit into the context of the study. It also lowers the margin of error in data collection because the data sources are a close fit to the research context. However, purposive sampling leads to the exclusion of several important subgroups from the sample, which leads to sampling bias and lopsided research outcomes.

Although, purposive sampling is not an effective sampling technique for collecting data from a large population, it has a number of advantages in research. Purposive sampling is a cost-effective sample selection technique as the researcher depends solely on his expertise to select sample members that best suit the study thereby eliminating all irrelevant members of the population that would have formed part of the sample. This saves much time that would have been spent on selection involving every member of the population. And because the researcher collects information from the best-fit participants, the margin of sampling error is lowered, leading to results that are very relevant to the research context.

However, due to the nonprobability nature of purposive sampling, the technique is saddled with a number of drawbacks. Purposive sampling is a source of invalid statistical inferences; it is subject to researcher manipulations and sampling biases and errors; purposive sampling excludes population members who genuinely would have been part of the study. Finally, when a large population is involved, purposive sampling is not an effective data collection technique.

(iv) Convenience Sampling

Convenience sampling, also called grab, accidental or opportunity sampling, is a technique in which a sample is drawn from that part of the population that is close to hand, readily available, or convenient. Convenience sampling is a non-probability sampling technique that is adopted by researchers where data is collected from available and easily accessible pool of respondents. In other words, convenience

sampling merely includes subjects who happen to be most accessible to the researcher. In this sampling technique, the researcher simply selects members of his study population based on proximity and does not consider whether they represent the entire population or not. In convenience sampling, the researcher uses accessibility and convenience to determine which participants make up the research sample. This means that the researcher only collects data from participants who can be identified and approached with as little effort as possible. There are no other criteria to the sampling method except that people be available and willing to participate. In addition, this type of sampling method does not require that a simple random sample is generated since the only criterion is whether the participants agree to participate (Saunders, Lewis, & Thornhill, 2012).

For instance, if a researcher wishes to obtain data on the study habit of 300 level students of Rivers State University, Port Harcourt, and he decides to draw his sample from only the 300 level students residing in the hostel (those easily accessible to him), this is an example of convenience sampling. It is a convenient way of gathering data, but it is not representative of 300 level students of Rivers State University.

It is the most commonly used sampling technique as it is incredibly prompt, uncomplicated, and economical. In many cases, members are readily approachable to be a part of the sample. Researchers use convenience sampling in situations where additional inputs are not necessary for the principal research. There are no criteria required to be a part of this sample. All components of the population are eligible and dependent on the researcher's expertise and closeness to the potential sample members, and does not bother whether they represent the entire population or not.

The convenience sampling technique has several merits. For instance, data collection is quick and easy. There are no stringent rules or criteria for selecting the sample, apart from expertise of, and closeness to the researcher. In situations where time is a constraint, many researchers go for this technique for quick data collection and other time considerations (Sim & Wright, 2000). Also, the convenience sampling technique is economical (inexpensive). Since there are no rigorous or stringent criteria to be followed, money is saved in choosing sample members and collecting data (Johnson & Christensen, 2014). The members of the population to be selected are readily available. This is so because the convenience sampling technique considers for sample selection only the aspects of the population that are readily available and easily accessible. Given this simplicity and uncomplicated nature of this technique, quotas are met quickly, and data collection is accomplished in minimum time. Further, it is very useful in time sensitive researches because very little preparation is needed to use convenience sampling for data collection; it is also useful when researchers need to conduct pilot data collection in order to gain a quick understanding of certain trends or to develop hypotheses for future research (Given, 2008).

Despite the numerous merits of convenience sampling, some demerits exist. The most outstanding demerit of convenience sampling is sampling bias. This bias causes under-representation of subgroups in the sample in comparison to the target population. Due to this bias, inferences based on convenience sampling cannot be made about the entire population but can only be made about the sample itself (Bornstein, Jager, & Putnick (2017). That is, the result from a sample generated using convenience sampling cannot be generalized to the target population because of the inherent bias of the convenience sampling technique. Therefore, convenience sampling is not often recommended for research due to the possibility of sampling error and lack of representation of the population. Also, convenience sampling is characterized with insufficient power to identify differences of population subgroups (Bornstein, Jager, Putnick (2017). Since sample is selected from the available and accessible part of the target population, the technique does not distinguish characteristics among participants. Due to the high probability of bias and insufficient power to identify differences, convenience sampling has low external validity.

Comparison between Convenience and Purposive Sampling Techniques

S/No.	Convenience Sampling	Purposive Sampling
1.	Convenience sampling is a nonprobability sampling technique	Purposive sampling is a nonprobability sampling technique
2.	Sample is drawn from population that is available and very close to the researcher.	Sample is the one whose characteristics are defined for the purpose that is relevant to the study
3.	Findings of a study based on convenience sampling can only be generalized to the sample from which the results are obtained and not to the entire population.	Findings of a study based on purposive sampling can only be generalized to the sample from which the results are obtained and not to the entire population.
4.	Convenience sampling technique is applicable to both qualitative and quantitative studies, although it is most frequently used in quantitative studies	Qualitative researchers use purpose sampling to recruit participants who can provide in-depth and detailed information about the phenomenon under investigation.
5.	Researcher selects only elements or subjects that are close to him without any criterion or characteristics.	Researcher uses defined criteria for the conscious selection of elements or subjects for inclusion in a study.
6.	Researcher does not know much about the elements or subjects of study.	Researcher's expertise and knowledge of elements or subjects are used for recruitment of sample members.
7.	Convenience sampling is cost-effective	Convenience sampling is cost-effective
8.	In convenience sampling the researcher does not manipulate the selection of sample members but simply uses subjects that are close to him.	Purposive sampling is subject to researcher's manipulations as he selects only participants who appeal to his expertise or knowledge.
9.	Convenience sampling does not involve any stringent criteria: It simply selects conveniently available subjects.	Purposive sampling involves rigorous and stringent selection criteria.

CONCLUSION

This review has shown that convenience and purposive sampling techniques are not the same, although they share some similarities. Both are nonprobability sampling techniques (grossly subjective sampling techniques), limited in external validity, and saddled with sampling biases. But while purposive sampling selects sample members from well-defined criteria based on researcher's expertise and knowledge, convenience sampling chooses its sample members based on proximity to the researcher. Further, convenience sampling can be used in both qualitative and quantitative study, but purposive sampling is typically used qualitative study.

RECOMMENDATIONS

Based on this study, it is recommended as follows:

1. Both convenience and purposive sampling techniques should not be recommended for research due to their possibility of sampling error and lack of representation of the population.
2. When the target population is small and easily accessible, convenience sampling should be employed for sample selection.
3. Purposive sampling technique should be used when the study focusses on special and sensitive skills, behaviour, attributes, or personalities.

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