

The importance of sample size in research studies

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Abstract

The increasing volume of research by the medical community are also leading numbers of contradictory findings and conclusions. The main reason of this contradiction is sampling variability and sample size. The differences observed between the groups may represent true difference, but significance level of the same difference is varying from one study to another study due to variation in sample size. Sample size not only affects the level of significance but also affect the power of the study and margin of error. Sample size has no direct relationship with effect size although increasing sample size increases reliability of the effect size detected between the groups. An appropriate sample size, allows the researcher to control the error (Type I & II error). At the time of planning of the study, the researcher must establish a justifiable level of statistical significance, with corresponding power of the study, targeted difference (ie, effect size), and the variability of the data (for continuous data). The proper planning of sample size can boost the study importance. The aim of this study is to discuss the effect of sample size on level of significance, power of the study and the reliability of the research findings.

He had published 82 research papers in various national / international journals. His expertise area is applied and medical statistics.

Speaker Publications:

1. Gogate N. Principles of sample size calculation. Indian J Ophthalmol. 2010;58:517–8.
2. Whitley E, Ball J. Statistics review 4: Sample size calculations. Crit Care. 2002;6:335–41.
3. Fosgate GT. Practical sample size calculations for surveillance and diagnostic investigations. J Vet Diagn Invest. 2009;21:3–14.
4. Bacchetti P. Current sample size conventions: Flaws, harms, and alternatives. BMC Med. 2010;8:17.
5. Malhotra RK, Indrayan A. Simple nomogram for estimating sample size for sensitivity and specificity of medical tests. Indian J Ophthalmol. 2010;58:519–22.

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Biography:

Prabhaker Mishra (DOB: January 1979), presently working as Associate Professor in SGPGI Lucknow-India. He had completed his PhD in Statistics on the topic “Statistical Study of Human vulnerability and Risk. Assessment of Natural Hazards in Orissa” as Senior research fellowship (ICMR) in 2010. He had worked as Assistant Professor (Biostatistics) in the Department of Community Medicine, in medical colleges during 2011 to 2014. He had co-supervised 12 MD students; and presently other 31 MD /2PhD and 1PhD students are pursuing under his co-supervision /supervision.