

LETTER TO THE EDITOR

Pseudo-longitudinal research design: a valuable epidemiological tool in resource-poor settings

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ETHICS APPROVAL

Exempted, as it does not involve human or animal data.

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FULL ARTICLE:

Dear Editor

It is imperative to research that researchers can draw valid and reliable conclusions that can be extrapolated to the wider population¹. For this reason, choosing the right design is vital for good research. Over time, quantitative research designs have evolved to combine elements of other designs. Most of these chimeric designs either increase the robustness of the analyses and/or increase efficiency by obtaining data of similar quality using fewer resources.

Public health and epidemiological research sometimes involve attempts to access traditionally hard-to-reach populations. These primarily rural and remote populations are even harder to monitor and follow up for long periods of time, making longitudinal studies very resource intensive.

In this context, a chimeric research design that warrants special mention is the pseudo-longitudinal study. Often described as quasi-longitudinal design, this type of design is one whose exact nature is a matter of debate. Some authors consider pseudo-

longitudinal studies as those where repeated cross-sectional data are collected from randomly selected subsamples of a population at different points in time, resulting in a dataset that mimics one generated from a prospective cohort design². Others consider it to be an advanced form of cross-sectional study where change in 'time' is measured by proxy, using a characteristic such as proficiency level or age. Data are collected only once, from the proxy temporal strata that the study population is divided into. If these strata do not differ significantly from each other with respect to background characteristics and potential confounders, except time of exposure to the risk factor, then random samples drawn from them would mimic a single cohort followed through time. This data can be used to indirectly construct a distribution of changes in outcome characteristics of a population with time, thus imitating a longitudinal design³.

We posit that the latter definition be considered to describe pseudo-longitudinal design, because in the former type the researchers are conducting a true longitudinal study. Thus, the former type of study design is better described as a pseudo-cohort design, a term that has been used previously in the literature⁴.

Pseudo-longitudinal studies offer a better estimate of temporality than those of cross-sectional design while being much less resource intensive than longitudinal ones. They can generate data for changes in a particular characteristic in a population over time, for example change in high risk behaviour of a community over a period of time after the initiation of a health program. Although considered to be less powerful than longitudinal studies, they have been seen to offer results comparable to those generated by traditional longitudinal designs^{5,6}.

However, what pseudo-longitudinal designs lack compared to true longitudinal studies is that the trajectories of individual study participants across time cannot be assessed; instead, analysis can

only be made at group levels.

In health care, where optimum use of resources is paramount, pseudo-longitudinal designs can essentially provide longitudinal data at the cost of a cross-sectional study. Pseudo-longitudinal designs are especially valuable in studying hard-to-reach populations such as tribal populations and high risk groups, which do not lend themselves to long-term follow-ups. For example, if a researcher aimed to document the changes in the lipid profile parameters since commencement of drinking in a remote tribal community, a pseudo-longitudinal study may be useful. Stratified random sampling may be followed, grouping participating community members in temporal strata (1 year of drinking, 2 years of drinking, etc.). Those within each strata should not differ significantly from each other with respect to background characteristics and potential confounders.

In the next step, random samples would be drawn from these strata, and the relationship between exposure and outcome variables can be explored. Collectively, these groups would mimic a single cohort of alcohol drinkers followed by a study for a long period of time. The pseudo-longitudinal design can provide longitudinal-like data, bypassing problems of attrition and costs associated with traditional longitudinal designs.

Given the ease of use and convenience, pseudo-longitudinal studies have been used extensively in the social sciences, most commonly in education^{7,8}. Biomedical researchers should start incorporating pseudo-longitudinal designs in their methodological repertoire and utilise them to generate valuable data in resource-poor settings, where true longitudinal studies are hard to perform.

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