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Age, HIV status, and research context determined attrition in a longitudinal cohort in Nigeria

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Abstract

Objectives: We explored determinants of attrition in a longitudinal cohort study in Nigeria.

Study Design and Setting: We enrolled 1,020 women into a prospective study. Of these, 973 were eligible to return for follow-up. We investigated the determinants of attrition among eligible women using a sequential mixed methods design. We used logistic regression models to compare the baseline characteristics of responders and nonresponders. At the end of the parent study, we conducted four focus group discussions and eight key informant interviews with nonresponders.

Results: Of the 973 women included in the quantitative analysis, 26% were nonresponders. From quantitative analysis, older women were less likely to drop out than younger women (reference: women ≤30 years; OR 0.46; 95% confidence interval [CI] 0.30−0.70, $P < 0.001$ women 31−44 years; and OR 0.31; 95% CI 0.17−0.56, $P < 0.001$ women ≥45 years). HIV-positive women were also less likely to drop out of the study (OR 0.45; 95% CI 0.33−0.63, $P < 0.001$). From qualitative analysis, contextual factors that influenced attrition were high cost of participation, therapeutic misconceptions, inaccurate expectations, spousal disapproval, unpleasant side effects, challenges in maintaining contact with participants, and participant difficulties in locating the study clinic.

Conclusion: Several participant-, research-, and environment-related factors influence attrition. Retention strategies that address these barriers are important to minimize attrition.

Keywords: Attrition; Drop out; Retention; Loss to follow-up; Longitudinal studies; Withdrawal

1. Introduction

Longitudinal studies are important for understanding relationships between risk factors and health outcomes, and can be used to determine causal relationships [1]. However, selective attrition in longitudinal studies, where individuals who continue to participate are systematically different from those who are lost to follow-up, may pose significant threats to the internal and external validity of results [2−4]. High levels of attrition can reduce the statistical power of a study to detect a difference among groups or treatments and may lead to biased effect estimates, especially when the loss to follow-up is nonrandom with respect to exposure and outcome [5,6]. High levels of attrition may also lead

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What is new?

- Existing information on determinants of attrition in prospective cohort studies in low- and middle-income countries is limited.
- We found that the likelihood of attrition was lower in older women compared with younger women less than 30 years old. HIV-positive women were also less likely to be lost to follow-up than HIV-negative women.
- We identified high cost of participation, therapeutic misconceptions, inaccurate expectations, spousal disapproval, unpleasant side effects, challenges in maintaining contact with participants, and participant difficulties in locating the study clinic as important contextual barriers to study retention.
- Future studies in similar settings need to incorporate retention strategies that address the direct and indirect cost of research participation; provide more thorough and complex informed consent procedures to prevent participant misconceptions about requirements for follow-up; collect multiple contact information for participants and test participants' phone numbers when the participants are still at the clinic to minimize attrition.

to other practical concerns such as prolongation of research studies to recruit more participants and increased costs. Therefore, focused efforts at optimizing participants' retention are important in the design and conduct of studies to ensure that findings are valid and the study remains adequately powered.

Minimizing attrition in longitudinal studies can be very challenging and requires considerable effort and time during the design and implementation stages [7]. It is even more challenging for studies that require in-person visits to the study site. In a systematic review of studies that evaluated different retention methods to reduce loss to follow-up, Booker et al. [8] reported that retention increased by an average of 18% when in-person visit to study sites for follow-up was replaced with postal questionnaires. In low- and middle-income countries (LMIC), there are additional challenges to participants' retention in prospective studies. These include limited public health and research infrastructure, poor follow-up culture, poverty, low levels of education and high mobility. In these settings, attrition may vary from 5%−30% in studies with tracking strategies, to 40%−52% in studies without tracking strategies [9]. Although there is no absolute standard for acceptable attrition levels, bias becomes a major concern if attrition exceeds 20% [10].

Recently, several articles have investigated the predictors of participant attrition in longitudinal studies [11−18]. All of the studies that were conducted in LMIC focused on the attrition of patients in HIV care programs [11−13]. The experiences in such situations may differ from prospective research cohorts, particularly when participants are free of disease at baseline. HIV care programs are relatively better funded than research studies in most LMIC. Many HIV programs have investigated and implemented various interventions, such as home visits, peer support, task shifting, decentralization of services, and motivational counseling, to minimize attrition [19]. Furthermore, a strong motivation for adherence in HIV care programs that may not be present in several research settings is the desire of HIV patients to reduce their high risk of morbidity and mortality associated with untreated HIV [20]. In contrast to attrition studies in LMIC, most of the attrition studies in high-income countries have focused on hard-to-reach populations such as ethnic minorities, children, and the elderly [14−16].

In this study, we use sequential mixed methods design to identify determinants of attrition in a longitudinal study in Nigeria, which required in-person study site visits for follow-up.

2. Methods

2.1. Study design

This study on the determinants of attrition was conducted within a parent prospective study that evaluated host and viral factors associated with persistent high-risk human papillomavirus (HPV) infection in Nigerian women. Details of the parent study have been previously described [21]. Briefly we recruited 1,020 women who were at least 18 years old and had a prior history of penetrative vaginal intercourse, from cervical cancer screening clinics in Abuja, Nigeria. We excluded women who could not commit to in-person follow-up visits, or had a history of cervical cancer or hysterectomy or were pregnant. We used structured questionnaires to collect information on demographic and lifestyle risk factors; performed a pelvic examination and collected biological specimens for HPV detection; and screened for cervical cancer using visual inspection with acetic acid/Lugol's Iodine. All participants were scheduled to return for follow-up visits 6 months after enrollment.

Within this parent study, we used sequential explanatory mixed methods design to evaluate the determinants of loss to follow-up. In this design, we collected and analyzed quantitative data and followed up with analysis of qualitative data collected in focus group interviews and key informant interviews (KIIs). Participant selection for the quantitative and qualitative data collection is described below and shown in Figure 1.

2.2. Study setting and selection of participants

Attrition was defined as attendance at the enrollment visit but failure to return for the scheduled follow-up visit