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ADVANCES IN PEDIATRIC RESEARCH

Recruiting a young adolescent rural cohort: Costs and lessons learnt

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Abstract

Background: Adolescent recruitment into longitudinal health studies is challenging. The aim of this paper is to report the detailed process and costs of recruiting young adolescents and their families into an intensive longitudinal study of the effects of puberty hormones on health, behaviour and wellbeing in early adolescence, based in regional/rural Australia.

Methods: Participants were recruited using a saturation strategy of targeted methods (including school visits and community events) and non-targeted recruitment approaches (including print and electronic media advertising, and social media). Direct (face-to-face contact with the public) and indirect (behind-the-scenes preparatory activities) researcher hours were calculated for each of the recruitment strategies.

Results: The study recruited 342 adolescent participants and a parent/guardian over two years. School and community-based recruitment required 6.2 and 6.0 researcher hours per activity, respectively. Direct researcher hours were primarily spent on delivering presentations and connecting with community members at community events. The majority of indirect hours were spent preparing and assembling information packs for distribution to students and parents during school visits. Non-targeted recruitment strategies using media advertising were the most frequently used methods. Researchers were estimated to have spent less than one hour for each media activity. In 27 months, an estimated $250,000 was spent on recruitment activities and resources. A combination of methods was used to recruit young adolescents and their families into a longitudinal health study.

Conclusions: The financial costs and researcher time committed to this study highlight the labour-intensive nature of recruitment. The data presented are useful for researchers planning longitudinal studies in adolescents.

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Introduction

Participant recruitment for longitudinal studies is often difficult [1,2]. Cost-effective strategies for limited research budgets are paramount [3,4]. Research with adolescent participants comes with additional challenges related to access to adolescents and obtaining both parental consent and adolescent agreement, while also applying developmentally appropriate recruitment strategies during a time when adolescents increasingly seek autonomy from adults [3,5,6]. The effort required to recruit into adolescent research is likely to be even greater if this research involves the collection of biological samples [7,8].

Inadequate recruitment often equates to inadequate statistical power [9]. Studies addressing recruitment have focused on schools, tertiary institutions or adult populations [10-12], with only one discussing adolescent recruitment in a non-urban setting [5]. Longitudinal health studies with adolescents require a realistic evaluation of the processes and financial costs of suitable recruitment, given the longer term investment required.

The Adolescent Rural Cohort study of Hormones, Health, Education, Environments and Relationships (ARCHER) is a longitudinal study that aims to determine the true effects of puberty hormones on adolescent health, wellbeing and behaviour. Via their parents, adolescents prior to, or in the early stages of pubertal development, were recruited to enter a study with intensive biological data collection, as documented in the published protocol [13]. To facilitate planning and costing of recruitment activities for future adolescent research by our investigators and other researchers, our aim was to detail the recruitment efforts for the ARCHER study. This manuscript: 1) documents the time-course of recruitment into the study; 2) describes the targeted and non-targeted recruitment strategies employed; 3) quantifies the human resource hours required to achieve the recruitment goal; and 4) estimates the financial costs for recruitment strategies and resources.

Methods

Study design and settings

With written consent from parents/guardians, and adolescent assent, the ARCHER study recruited young adolescents in school years 5, 6 or 7 (aged 10 to 12 years) from two major regional/rural areas around the towns of Dubbo and Orange in the state of New South Wales (NSW), Australia. Adolescents were required to complete an annual questionnaire, anthropometric assessment and blood collection, and provide three-monthly urine collections, all completed outside of school. The adolescent received a gift card or movie tickets to the value of $AUS 20.00 after each completed annual blood sample, and a takeaway breakfast pack was provided after the annual fasting blood tests. One parent/guardian of each adolescent was also recruited into the study to complete annual questionnaires only; they received no incentives for their participation.

Ethics

Ethics approval was granted by The University of Sydney Human Research Ethics Committee (HREC 13094). Approvals to recruit through schools were also obtained from the Western Region of the Department of Education and Training, and the Catholic Education Office, Bathurst Diocese.

Pre-recruitment and feasibility studies

Pre-recruitment involved two years of feasibility studies and included the establishment of Community Engagement and Community Consultation Committees to evaluate effective methods of engaging the local community, which included Indigenous residents. Local researchers liaised with, and presented to local community interest groups, Aboriginal Medical Services (AMS), school aboriginal liaison officers and the Aboriginal Education Consultative Group (AECG). Advice from cultural services was sought to gauge the appropriateness of recruitment methods for adolescents of Indigenous Australian descent to encourage participation. The protocol aimed to recruit 10% Indigenous participants, which is greater than the overall prevalence of Indigenous persons in Australia but less than the prevalence in the partcipating community. Our Indigenous recruitment followed guidelines from the Aboriginal Health and

Medical Research Committee. Empirical evidence and experience gained from committee activities and initial focus group studies [8] guided the design and development of the ARCHER recruitment strategies. Upon completion of the 2009-2010 feasibility studies, a questionnaire was distributed to 52 parents/guardians with children in years 5 and 6 at a local independent school involved in the feasibility studies to explore the reasons why they declined to participate in the full ARCHER study.

Recruitment for the ARCHER study

A recruitment period of 12 months was proposed, based on the enrolment rate in the feasibility studies. Full study funding was obtained for four years, commencing in January 2011. Data collection began in June 2011, after employment of staff and initiation of recruitment procedures. As per ethical approval, all recruitment procedures were targeted to parents. Both adolescents and their parents provided data for the study. In this paper, 'participants' refers to both adolescents and their parents, unless otherwise specified. Targeted and non-targeted recruitment methods were used as described below, and saturated in order to optimise the chances of achieving the recruitment targets based on power analyses.

Targeted recruitment strategies

Targeted recruitment was defined as an event with the sole intent to recruit participants into the ARCHER study. These methods involved school visits and community events. Attendees were provided with information packs that initially consisted of a flyer, Participant Information Statement (PIS) and consent booklet, and an ARCHER magnet. Packs distributed through schools were addressed to parents and included an additional letter from the relevant Education Board and/or school principal confirming recruitment approval. Later, a simple Expression of Interest (EOI) form replaced the more detailed PIS consent booklet in all information packs. A positive response to the EOI permitted researchers to liaise directly with parents/guardians, discuss complex study information and obtain consent.

- School visits*:* This strategy involved: i) presentations by the researchers to schools and classes under supervision, followed by the distribution of information packs by their teacher; ii) inclusion of the ARCHER flyer or a study summary in the school newsletter; or iii) distribution of information packs by teachers for students to take home.

- Community events*:* Local researchers delivered study presentations at community meetings and to youth sporting teams, again directed to adults. Researchers erected ARCHER stalls at local conferences, community festivals and shopping malls to distribute flyers and meet the community.

Non-targeted recruitment strategies

Non-targeted recruitment was defined as strategies that aimed to increase knowledge about, and the profile of, the ARCHER study, but were not branded as a study invitation. These methods included print and electronic media advertisements and social media strategies. ARCHER pens, frisbees and fridge magnets distributed at community events and information stalls were also identified as indirect recruitment methods.

- ARCHER specific events: Sydney-based senior ARCHER investigators travelled to regional community venues to hold seminar presentations for parents, teacher groups and health professionals about relevant adolescent health and wellbeing issues. These talks facilitated interactions with attendees, enabling discussions about the ARCHER study. While recruitment was still active, the researchers were already holding biannual ARCHER gatherings to thank already recruited adolescents for their continued participation in the study. Activities included ten-pin bowling, indoor gymnasium activities, and new-release movie screenings. Adolescents were encouraged to invite a friend or sibling. No recruitment information was circulated with the event invitations. Study flyers and information packs were made available to interested parents/guardians at the conclusion of these gatherings.

- Print and electronic media advertising: Flyers clearly addressed to parents/guardians were displayed on noticeboards at participating schools, and at community venues including tertiary education institutions, workplaces, pharmacies, ambulance stations, general practices, local council recreational facilities, Police Citizen Youth Clubs, neighbourhood centres and selected retail outlets. Web-based community event calendars were used to post selected local ARCHER events online [14,15]. Interviews with ARCHER investigators were conducted for local radio stations and television news reports, local newspapers and magazines.

- Social media: An ARCHER Facebook page was established in the first year of recruitment and implemented as a formal research strategy in the second year. ARCHER parents were invited to "like" the Facebook page to stay up-to-date with study information and adolescent and family-related issues. Activities on the Facebook page by existing parents had the potential to further promote the ARCHER study through friend networks.

Estimation of researcher hours related to recruitment

Direct and indirect research hours were recorded for two research assistants (one full-time and one 0.8 full-time equivalent, FTE) and one part-time administrative assistant (0.6 FTE) employed by the study grant. Only activities of 15 minutes or more were recorded. The researcher hours did not include time donated by the senior study investigators, ARCHER parents, community members, medical and postgraduate students, and staff at the University regional faculties.

Direct hours included the time spent on executing a recruitment strategy, including school visit and seminar presentations, media interviews and creating Facebook posts. Indirect hours included time spent preparing for an event or recruitment strategy, such as printing and collating information packs, and travel time. It did not include decision-making hours spent refining recruitment protocols, developing or organising seminars or preparing electronic presentations. Time spent on media strategies only counted time directly related to media interviews and to the creation of Facebook posts.

Project costs

These included what was provided by a four-year peer reviewed grant and the estimated cost of items not or only partly covered by this grant. Recruitment costs were budgeted per participant, but recruitment was expected to last only 12 months based on feasibility studies. As recruitment continued for a further 15 months and there were no funds in the budget for extra staff time, staff deployment in recruitment meant other research tasks including data entry and cleaning and active retention strategies were reduced. The grant budget for recruitment also covered the purchase of consumables, costs associated with printing and the postage of study materials, and reply-paid envelopes. The costs of venue hire, catering at community meetings and engagement activities, resources for the recruitment of Indigenous participants, and reimbursement for staff using a private car to attend community meetings and visit schools was also within budget. Travel and accommodation for senior investigators from Sydney to the rural destination for seminar presentations were from alternate sources not included in the grant budget. Similarly, ARCHER gatherings were not covered in the budget and costs had to be sourced through donations.

Results

Feasibility studies

Approximately 50% of parents who participated in the feasibility study indicated that they would enrol their child into the ARCHER study. Twenty-five surveys (48%) from non-participating parents at the conclusion of the feasibility study were returned. Lack of time (38%) and concern over the blood collections (25%) were the two main reasons parents reported for not participating in ARCHER. Concern over the blood collections was also the primary reason for adolescent non-participation (57%).

Recruitment outcomes

Recruitment took 27 months to achieve an adequately powered study. A total of 342 adolescents and 272 parents/guardians consented and provided baseline data. Of these, 24 were participants involved in earlier feasibility studies (October 2010 to January 2011) who opted to continue their involvement in the main study (Figure 1). Sixty-one families had more than one child in the study. Median age of the male and female adolescents at recruitment was 11.0 years (range 10-13).

Recruitment rate

The average recruitment rate was three enrolments per week (Figure 1). The five months with the highest number of enrolments were July (28 consents), November (26 consents), and June (21 consents) in 2011, and May and October (21 consents each) in 2012. The lowest points of recruitment can be seen during the Australian summer (February 2012 and December-February 2013).

Recruitment strategies

The five months with the highest number of recruitment activities were July (20 activities) and August (18 activities) in 2011, and August (21 activities), October (20 activities), and December (16 activities) in 2012 (Figure 2).

Table 1 summarises the 250 recruitment activities and the number of direct and indirect researcher hours spent during recruitment. An estimated total of 3.8 recruitment hours was dedicated to each participant. Figure 2 illustrates the frequency with which each targeted and non-targeted recruitment strategy was performed each month.

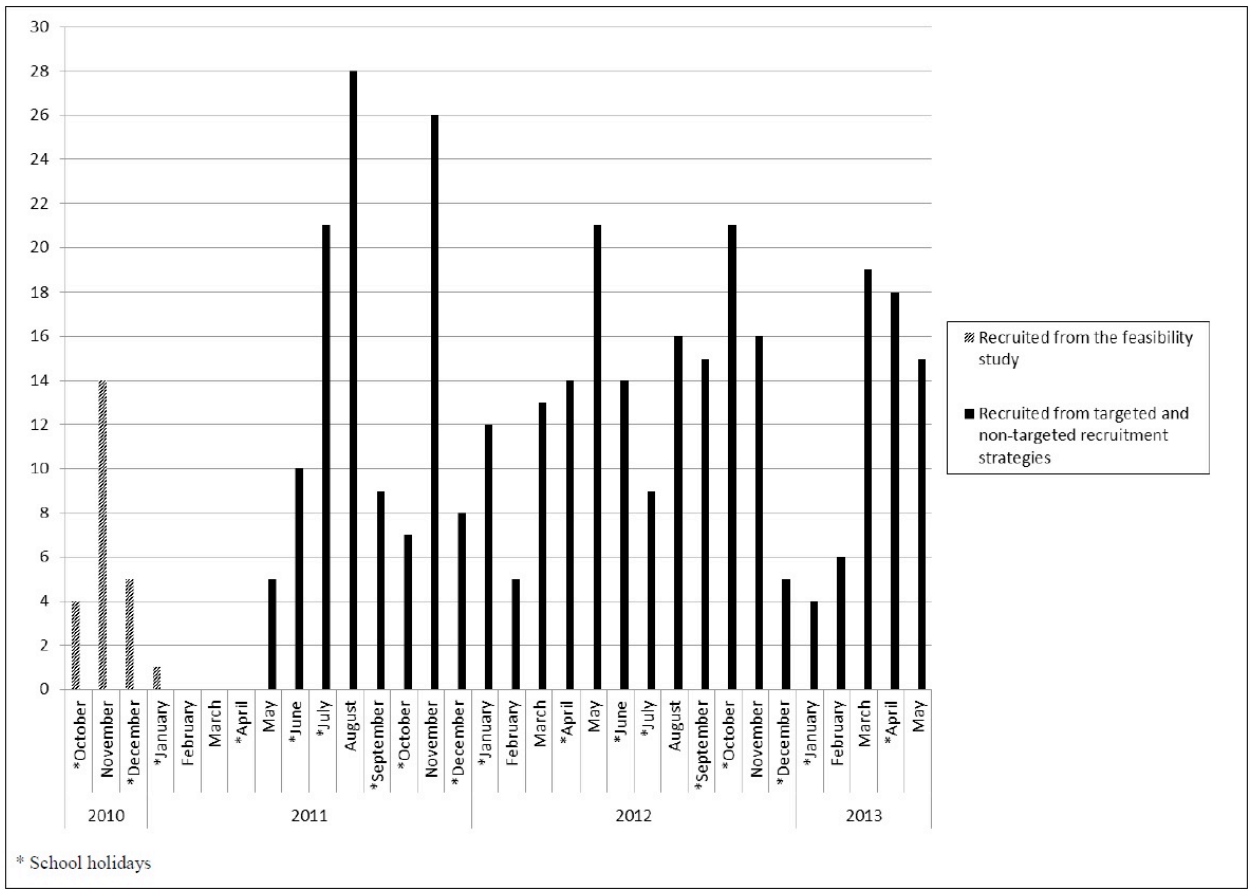

Figure 1. The number of participants recruited each month

Table 1. Estimated researcher hours spent on targeted and non-targeted recruitment methods

Recruitment strategy	Activity count	Estimated researcher hours		
		Direct	Indirect	Researcher hours per activity
Targeted recruitment				
School visits	59	90	275	6.2
Meetings with school principals/parents	15	18	29	3.1
Staff–student school presentation with information pack distribution	41	72	221	7.1
Information pack distribution without school presentation	3	0	25	8.3
Community events	32	142	50	6.0
Community meetings (talks)	7	33	14	6.7
Community events with stalls	5	21	10	6.2
Community events (mingling)	8	27	10	4.6
Community centre/venue stalls	1	12	5	17.0
Conference stalls	5	42	7	9.8
Youth group talks	4	5	4	2.3
Other	2	2	0	1.0
Non-targeted recruitment				
ARCHER events	22	90	162	11.5
Seminar presentations	16	46	85	8.2
Thank you gatherings for young participants	6	44	77	20.2
Media	137	21	108	0.9
Newspaper interview articles	31	8	11	0.6
Other print articles (e.g. magazines, university media)	3	1	2	1.0
Radio interviews	9	4	4	0.9
Television interview	1	1	0	1.0
Community web-based notice boards	2	0	0	0.0
Facebook posts	91	7	91	1.1
Overall	250	343	595	3.8

Recruitment costs

Researcher hours (and thus researcher salary) devoted to recruitment decreased as the study progressed. It was estimated that a minimum of 50% of researcher hours overall (and thus salary costs) was spent on recruitment activities during the lengthy recruitment period.

Recruitment costs included staff salary (76% only of which was covered by the grant), community engagement, travel, and communication resources over 27 months (Table 2). Non-grant supported costs, raised from other sources, are also shown in Table 2. Infrastructure required by researchers, including office space and equipment, was provided by the Institution as infrastructure support and is not included in costs.

The total estimated cost of recruitment was $AUD 250,000. Just over $AUD 700 was spent for each individual recruited (Table 2). At the time of submission, one Australian Dollar was equivalent to $0.79 dollars.

Discussion

This study is one of only a few to report the process and costs associated with recruiting young adolescents for health research. The recruitment methods used were multiple and concurrent and as such it is not possible to delineate the methods that worked best.

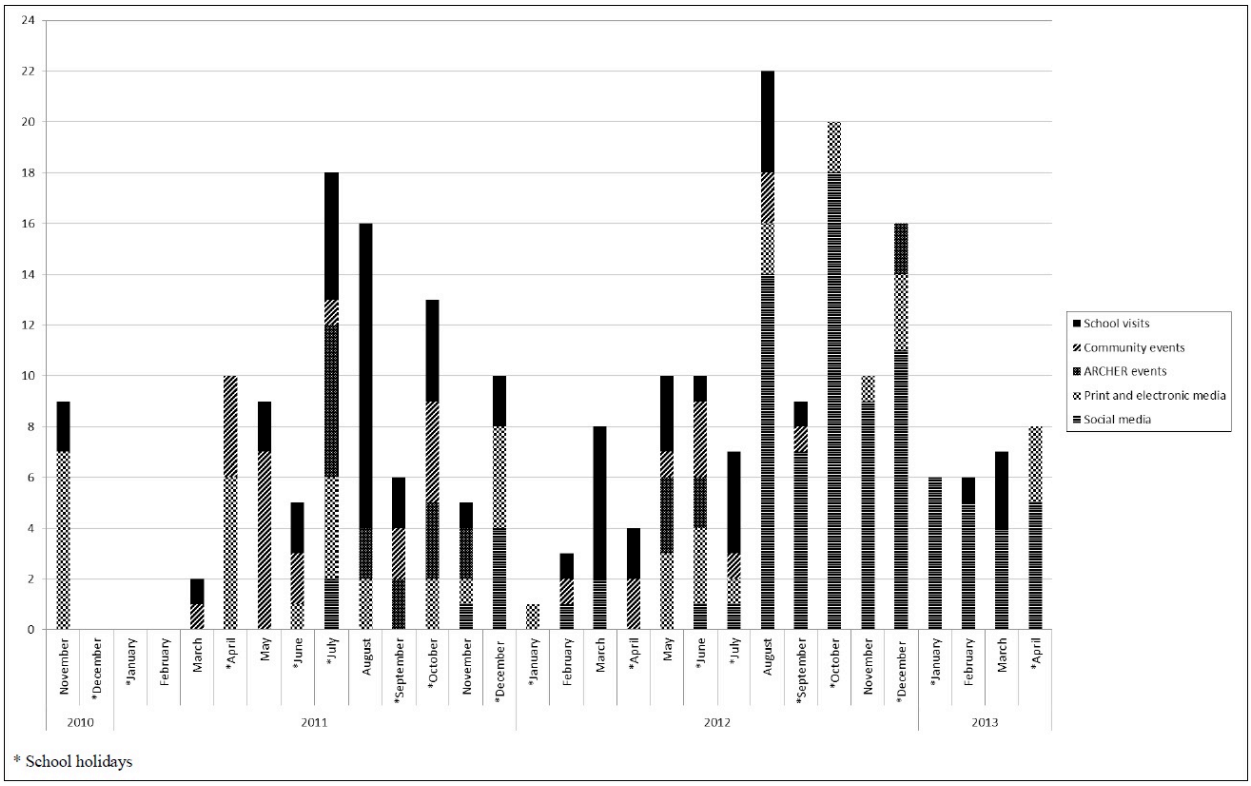

Figure 2. A summary of the recruitment strategies conducted each month during the recruitment phase of the ARCHER study

A total of 250 targeted and non-targeted recruitment methods used a saturated strategy to enrol 342 adolescent-parent dyads. Recruitment costs were around $AUD 250,000, equating to just over $AUD 700 per participant, with a quarter of these costs not covered by the original grant. Our findings highlight the significant time, effort and financial costs required to recruit young adolescents into research studies.

Longitudinal cohort studies involving children/adolescents and an intensive biological sample collection schedule have documented various recruitment rates [16-18]. For this study, national population statistics indicated that approximately 4,500 school students in the local rural community were eligible for recruitment [19]. However, the 12 months originally allocated for recruitment and based on the uptake of feasibility studies had to be extended to reach the final number of enrolments. Our rate of recruitment was similar to the Early Bird Study investigating the longitudinal development of insulin resistance [17,18], which recruited 307 children aged between 5 and 16 years, over two years, from schools in the United Kingdom.

The age group of the study is at a time of emerging autonomy; however, due to ethical issues, initial consent was directed at parents/guardians. When designing recruitment strategies for research, adolescent and community engagement and involvement is important. The focus group study undertaken before full recruitment commenced emphasised the necessity for investing time into delivering detailed explanations of the research purpose and methodology to adolescents to increase interest and participation [8]. Thus, it was important that while recruitment was targeted towards parents/guardians, the adolescents were also informed about details of the study, and their participation made them feel valued. These requirements are evident in the recruitment strategies chosen for the ARCHER study.

Table 2. Total costs of recruitment

Recruitment resource/activity	Allocated grant budget	Additional funds sourced	Totals
Staff †			
Research assistant (1.8 FTE; $AUD)	124,323	41,750	166,073
Administration assistant (0.6 FTE; $AUD)	33,188	9,956	43,144
Community engagement			
Catering/venue costs for community meetings ($AUD)	2,900		2,900
Local travel			
Mileage ($AUD)	1,884		1,884
Communication			
Stationery ($AUD)	15, 092		15, 092
Postage ($AUD)	1,840		1,840
ARCHER gatherings ($AUD)		12,307	12,307
Prize draws for completion of visits ($AUD)		450	450
Parent prize draw ($AUD)		200	200
Total ($AUD)	179,227	64,663	243,890

†Researcher salary was calculated over 27 months at 50% of researcher time spent on recruitment activities.

The recorded researcher hours identify adolescent recruitment as a time and resource-intensive endeavour. However, the actual time calculations are still likely to be underestimated, since other recruitment-related duties were not routinely recorded. Examples of these duties include the time spent on discussing the study with potential recruits and making follow-up telephone calls. The important finding is that the true costs of recruitment were formidable and at a level that might make grant applications appear inflated, unless supported by data such as ours. Whether or not research budgets should include a full-time recruitment officer solely responsible for recruitment activities is something to consider for future projects.

It is likely that a major, but unquantifiable, contribution to the ultimately successful recruitment in this study is that researchers at the forefront of recruitment were active members of the Dubbo and Orange communities; living, working and raising their families in these locations. This situation eliminated the time and effort required for external researchers to establish rapport with community members [20]. Residents in the Dubbo location were also familiar with the concept of research participation, as several health studies have been conducted in the area [21,22].

A limitation of this study is that we were unable to identify which recruitment strategy was responsible for a parent to consent to recruitment. A strength of the study was the feasibility study results, which assisted in the logistics for data collection, and provided information on enablers and barriers to participation. Future research could benefit from our insights into why parents decline to consent, and should consider identifying optimal approaches through community consultation.

Conclusions

Recruitment of adolescents into a complex research study is a time-intensive and financially costly experience. These data will assist researchers to be bolder and creatively more realistic when budgeting for intensive longitudinal studies in this age group. Social media was not extensively used due to the young age of adolescent participants; however it could be considered with older adolescents as a cost-saving approach.

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