

How to write a paper and get your work published – part 1

Aspiring and Inspiring Respiratory Researchers
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Writing an Original Research article

- Assuming it's an Original Research paper: remind yourself of what the research question(s) was/were. What were the aims? Have you fulfilled those aims?
- **Clarity of thought leads to clarity of expression**
- Choose an appropriate journal at this stage
- Read the author instructions!
- Think about the length of the paper – *npjPCRM* = 5000 words including references

Title

- Appropriate
- Explanatory
- Often contains elements of the methodology (e.g. a multinational, randomised controlled trial)
- Use a colon to help if necessary
- Eye-catching if possible!
- Possibility of an acronym?

List of authors

- Get advice from your supervisor/mentor/head of department
- First author
- Second author
- Corresponding author
- Last-named author (head of department/supervisor etc)
- Who to include/exclude?
- Acknowledgement rather than authorship?

Abstract

- **Clarity of thought and presentation**
- Check journal info; 2-400 words?
- Catch the reader's (and the editors', and the reviewers'!...) attention
- Succinct summary of the paper – headline points
- Present new data clearly
- Emphasise the points which make this paper important/citeable/worth publishing
- **Remember – many journals will make their initial decision (whether to send out to referees or to reject immediately) based on the quality of the abstract**

Introduction

- Give the background for, and the rationale behind, your study. I.e.;
- Introduce the subject; summarise **and reference** directly relevant previous work – with a **short** balanced appraisal of the strengths/deficiencies of previous work
- Where are the deficiencies in knowledge/what are the questions that still need answering?
- Don't make statements that aren't justifiable
- Last paragraph of the Introduction - give your research question(s) and the aim(s) of the study. I.e. 'Therefore, we conducted this study to determine...' or, 'Therefore, the aim of this study was....'

3 Key Questions

- What was the research question?
[Introduction – last paragraph]
- What is the research design? [First part of
Methods section, title as well?]
- Is the research design appropriate to the
question?

Nothing upsets an Editor so much as reading a research paper where the authors have obviously worked extremely hard, but the wrong research methodology has been used from the outset...

Different types of research design

- Primary research
- Secondary research – systematic reviews and subsequent meta-analysis, health economic analyses

Primary research designs – randomised controlled trials (RCTs)

- 2 'identical' populations selected by computer randomisation with strict selection criteria – one group receives the intervention, the other (control) group doesn't
- Both groups then analysed for specific pre-determined outcomes or 'endpoints' (e.g. death, asthma-related hospital admission, change in FEV1)
- Since groups are identical apart from the intervention, theoretically any differences in outcome are due to the intervention...

Primary research designs - RCTs

- PROS: Rigorous evaluation of a single variable in a precisely defined highly selected population – essential (for example) for Phase III drug registration trials to show effect of intervention
- Inherently prospective – data collection after start of study
- Eradicates bias (in theory)
- Permits subsequent meta-analysis
- CONS: expensive, time-consuming, how relevant to real-life? (strict selection criteria), need for more pragmatic selection? hidden bias?, imperfect randomisation?, outcomes not relevant to patients?

Primary research designs – cohort studies

- 2 (or more) groups of people selected on the basis of exposure to a particular agent (e.g. toxin, vaccine, medicine) and followed up to see how many develop a particular outcome.
- Follow-up often over years
- Results often expressed in terms of odds ratio (OR) – i.e. the likelihood (odds) of an event occurring
- Best example: Doll and Hill. BMJ 1964 (i) 1399-1467. 40,000 male doctors, 4 cohorts: non-smokers, light, moderate and heavy smokers.

Primary research designs – case-control studies

- Patients with a particular disease or condition are identified and 'matched' with controls (patients with some other disease, the general population, etc)
- Data then collected retrospectively on past exposure to a possible causal agent for the disease/condition concerned
- Difficulties: Who is a 'case'? Are the controls truly 'matched'?
- Can only show an association, not causality

ARTICLE OPEN

Investigating the association between obesity and asthma in 6- to 8-year-old Saudi children: a matched case–control study

Mahmoud Nahhas¹, Raj Bhopal², Chantelle Anandan¹, Rob Elton³ and Aziz Sheikh^{1,4}

BACKGROUND: Previous studies have demonstrated an association between obesity and asthma, but there remains considerable uncertainty about whether this reflects an underlying causal relationship.

AIMS: To investigate the association between obesity and asthma in pre-pubertal children and to investigate the roles of airway obstruction and atopy as possible causal mechanisms.

METHODS: We conducted an age- and sex-matched case–control study of 1,264 6- to 8-year-old schoolchildren with and without asthma recruited from 37 randomly selected schools in Madinah, Saudi Arabia. The body mass index (BMI), waist circumference and skin fold thickness of the 632 children with asthma were compared with those of the 632 control children without asthma.

Associations between obesity and asthma, adjusted for other potential risk factors, were assessed separately in boys and girls using conditional logistic regression analysis. The possible mediating roles of atopy and airway obstruction were studied by investigating the impact of incorporating data on sensitisation to common aeroallergens and measurements of lung function.

RESULTS: BMI was associated with asthma in boys (odds ratio (OR) = 1.14, 95% confidence interval (CI), 1.08–1.20; adjusted OR = 1.11, 95% CI, 1.03–1.19) and girls (OR = 1.37, 95% CI, 1.26–1.50; adjusted OR = 1.38, 95% CI, 1.23–1.56). Adjusting for forced expiratory volume in 1 s had a negligible impact on these associations, but these were attenuated following adjustment for allergic sensitisation, particularly in girls (girls: OR = 1.25; 95% CI, 0.96–1.60; boys: OR = 1.09, 95% CI, 0.99–1.19).

CONCLUSIONS: BMI is associated with asthma in pre-pubertal Saudi boys and girls; this effect does not appear to be mediated through respiratory obstruction, but in girls this may at least partially be mediated through increased risk of allergic sensitisation.

Primary research designs – cross-sectional surveys

- The realm of epidemiologists...
- Representative sample of participants is recruited and then interviewed or studied to gain answers to a specific clinical question.
- Data collected at a single time point but may be compared retrospectively with previously collected data
- Observational format

Primary research designs – case reports

- Very accessible way of presenting a particular clinical case – a ‘story’
- Can be published rapidly
- Useful learning tool
- E.g.: McBride WG. Thalidomide and congenital abnormalities *Lancet* 1961(ii), 1358



Optimal study designs

- Does this treatment work? **Systematic review; RCT**
- Does it work in real-life practice? **Pragmatic RCT**
- How good is a diagnostic test? **Prospective cohort study**
- Should we screen? **RCT**
- What causes this disease? **RCT, prospective cohort study, case control study**
- What did people think or do? **Cohort study, cross-sectional survey, qualitative study**
- Other more specialist contexts/designs: genetic epidemiology, health economics, etc

Methods

- Subheadings are useful: study design; subjects/study population; selection criteria; equipment; questionnaire details; data analysis; statistical analysis, etc
- Give appropriate detail – of interventions, inclusion/exclusion criteria, attempts to minimise bias, selection of (matched) controls etc
- Main outcome/secondary outcomes
- **Clarity of presentation**
- Be honest
- Flow diagram of the study interventions and phases can be useful
- Last paragraph – give details of ethical approval obtained

Results

- Sub-headings are useful
- Numbers of subjects and controls available for study analysis – i.e. the ‘initial data sets’ for the study.
Flow diagram of subject numbers is useful
- Relevant results with appropriate statistical analysis – p values, 95% CI values etc. Seek help from statistician as appropriate
- One well-drawn figure can express 2-300 words...
- Which results need to be shown in order to confirm/refute your research question(s)?
- Which results are subsidiary? (Can they be included as online-only appendix or in the fuller online version?)

Discussion

- Did you fulfil your aims/answer your research question? If you did – say so. If not – say so.
- Main findings – using sub-headings?
- Difficulties encountered during the study
- Strengths/limitations of this study
- Comparison with other published work in this field
- Other methodological points worth raising – would alternative methods have been appropriate?
- New questions arising
- Lessons for clinical practice as a result of this study
- Conclusions and/or Box summary of main Discussion points?

Discussion

- Ensure **clarity of thought and presentation**
- Don't exaggerate
- Justify all of your statements, and cite appropriate references
- Be scrupulously self-critical in analysing the weaknesses of the study – if **you** aren't, the referees will certainly be!

Acknowledgements

- Subjects?
- Practices?
- GPs/asthma nurses?
- Statistical advisors?
- University institutions?
- Colleagues who've advised on the manuscript?
- Mentor/supervisor?
- Editorial/secretarial assistance???
- Pharma company input?

Conflict of Interest declaration

- Be honest and appropriate
- If in doubt, declare any potential conflicts of interest – it is up to the editor(s) whether or not they publish them
- NB - attending conferences, lecture fees, advisory board/consultancy honoraria, etc – all need to be declared

References

- See the journal's Guide for authors...

Putting it all together

- Get a basic first draft written
- Send to your co-authors
- Second draft
- Further revisions
- Final decision on journal selection – choose the journal carefully
- ****Check the journal's Guide for Authors!!****
- Check paper length
- Cuts if needed? [NB – are there two or more papers rather than one?]
- **Clarity of thought, presentation and expression**
- Final version to co-authors for final sign-off

Submitting your manuscript

- Seek help from people in the department who've got experience
- Follow the journal instructions carefully – is it online submission, e-mail submission etc?
- Do you need secretarial help for submission?
- NB – separate electronic files for Tables and Figures?
- Are you asked to make suggestions for preferred referees?
- SUBMIT
- Then celebrate and keep fingers crossed...!