writing the results and discussion

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José Florencio F. Lapeña Jr. M.A., M.D., F.P.C.S.
lapenajf@upm.edu.ph
writing results / discussion

introduction → why did we start?
methods → what did we do?
results → what did we find?
discussion → what does it mean?

Sia, Alex. Writing the Introduction and Discussion. (Unpublished Lecture). Pre-Congress Medical Writing Workshop, 14th ASEAN Paediatric Congress & 3rd Asian Paediatric Otolaryngology Meeting, Singapore: 14 April 2011.
perspective

putting it together

introduction: tell them what you are going to say
  • introduction (why did we study?)

body: say it
  • methods (who, what, when, where, how did we study?)
  • results (what did we find?) and
  • discussion (what do the findings mean?) and

conclusion: tell them what you said
writing the results
at the end of this session, you will learn

• the purpose and process of writing the results
• common errors in writing the results

objectives
**purpose**

To present the main data collected and the observations made during the research.

**results**

- Present the analyzed data without discussing it
- Guide the reader through the questions investigated in the study
- Set the stage for the discussion (next section)

Ng KH, Peh WCG., Effective medical writing (Pointers to getting your article published): Writing the Results. *Singapore Med J* 2008; 49(12): 967-969.
process

• review the analyzed data and determine which results to present
• do not present all results obtained or observed
• decide which results are relevant to the question(s) presented in the introduction whether or not they support the hypothesis
• do not include details on methods, materials or discussion and conclusions

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process

• report outcomes for each item in materials & methods
• do not report results for items that are not listed in materials and methods
• summarize data, especially numbers and statistics
• do not report raw data
• supplement with illustrative tables and figures
• if you show, don’t tell

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RESULTS
Mother’s ages range in selective samples are 21-54 years (mean age 31 years) and 84% of them were literate with minimum criteria of being able to read or write. 97% were aware of advantages of breastfeeding. All of them initiated breast-feeding in initial days but later on they quitted breast-feeding before 2 years.
The result of survey showed a major reason (54%) behind the discontinuation of breast-feeding at early period is having “not enough milk” in their breasts. Among these mothers, 32% think that their small breast size is responsible while remaining mothers think the cause is their poor body nourishment either due to having some disease (28%) or can not affordable to purchase extra food needed for their nourishment.
The second major reason (23%) say that their babies were not feeling well after receiving their breast milk. Among them 40% had pain abdomen, 36% gas formation and 25% noticed abnormal bowel habits in their babies.
Other reasons discovered in this study are that their babies were still feeling hungry after breast fed (10%), difficult to give enough time for lactation as doing work outside home (6%), fear of loss of physical attraction (4%) and milk dried up (3%).
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<table>
<thead>
<tr>
<th>FACTORS</th>
<th>NUMBER OF OBSERVATION</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not enough milk</td>
<td>95</td>
<td>54</td>
</tr>
<tr>
<td>Baby not feeling well after breast fed</td>
<td>40</td>
<td>23</td>
</tr>
<tr>
<td>Baby feeling hungry after breast fed</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>Not enough time for lactation as doing work outside</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Fear of loss of physical attraction</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Milk dried up</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>176</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 1
1 = Not enough milk
2 = Baby not feeling well after breast fed
3 = Baby feeling hungry after breast fed
4 = Not enough time for lactation as doing work outside
5 = Fear of loss of physical attraction
6 = Milk dried up
1 = Not enough milk
2 = Baby not feeling well after breast fed
3 = Baby feeling hungry after breast fed
4 = Not enough time for lactation as doing work outside
5 = Fear of loss of physical attraction
6 = Milk dried up
common errors

• illogical sequence of data presentation

• inaccurate data

• repetition of data

• expected data from the materials and methods section not reported

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common errors

• misplaced information between materials & methods and results sections

• inappropriate presentation of data – overuse and abuse of tables and figures

• attempts to draw conclusions – should be covered in discussion section

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common errors
avoid the squid technique

“the author is doubtful about his facts or reasoning and retreats behind a protective cloud of ink.”

doug savile

writing the results
take home points

1. present relevant data collected from the experiment
2. present the main results without going into the discussion and conclusion
3. prepare the analyzed data in the form of a table, figure, or in text form
4. write in past tense

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writing the discussion

at the end of this session, you will learn

- the purpose and process of writing the discussion
- how to write the discussion and tell a good story

objectives
‘here is why our findings are remarkable… ’

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writing the discussion

1. compact the conclusion
summarize the most important finding
conclusion of the primary outcome

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writing the discussion

2. comparison to and consistency with other studies

our study show that there are differences…
possible reasons for the differences are…

our study is consistent with studies x,y,z in the findings of…

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writing the discussion

3. plausible explanations

scientific pathway in explanation
basic science linkage or relationship
writing the discussion

4. limitations and caveats to this study
   study population?
   study design?
   retrospective versus prospective, rct versus observational
   measurement limitations?
   subjective or objective

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5. implications
   clinical implications
   research implications

what is the next step for future research?

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6. conclusion

copy and paste the 1st paragraph of discussion paraphrase the paragraph does it have a concise and consistent message?

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External Auditory Canal Dimensions, Age and Cerumen Retention or Impaction in Down Syndrome

Alexander Edward S. Dy, MD, José Florencio F. Lapeña Jr., MA, MD

Affiliations: aDepartment of Otorhinolaryngology, Philippine General Hospital; and bDepartment of Otorhinolaryngology, College of Medicine - Philippine General Hospital; University of the Philippines Manila

Address correspondence to: José Florencio F. Lapeña, Jr., MA, MD, Department of Otorhinolaryngology, Ward 10, Philippine General Hospital, University of the Philippines Manila, Taft Avenue, Ermita, Manila 1000, Philippines. Email: lapenajf@upm.edu.ph, jflapena@up.edu.ph. Tel.(632)-554-8467 Fax.(632)-524-4455

Short title: Ear Canal Dimensions, Age and Ear Wax in Down Syndrome

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Conflicts of Interest: The authors have no conflicts of interest to disclose.

Clinical Trial Registration: Philippine Health Research Registry ID: PHRR160622-001290 Available at:
ABSTRACT

BACKGROUND AND OBJECTIVE:
The association of EAC diameter, age, and earwax in DS has not been adequately elucidated, nor has it been established whether cerumen problems increase or decrease at a particular age or diameter. We aim to determine the association between ear canal dimensions, age and cerumen retention or impaction in DS.

METHODS:
This cross-sectional review of 130 persons with DS evaluated EAC dimensions, wax retention or impaction, and middle ear status with pneumatoscopy after extraction. Descriptive and inferential statistics correlated age, presence of impacted or retained cerumen and EAC diameter.

RESULTS:
Of 67 males and 63 females with average age 9.5 years, 72.3% (94) had EAC stenosis of ≤ 4mm. Each year added in age increased the odds of larger EAC size by 1.21 times. Those ≤ 1year were 3.2 times more likely to have cerumen problems than those > 1year. The odds of having cerumen problems with an EAC diameter of ≤ 4mm were 3.3 times higher than with an EAC diameter of 5mm, and odds of having cerumen impaction were as much as 6.2 times higher. Male gender and low-lying external ear were also associated with increased odds of earwax problems.

CONCLUSION:
There is a high prevalence of cerumen retention or impaction in persons with DS compared to the general Philippine population, and a higher prevalence rate for EAC stenosis than elsewhere. An EAC diameter of 4mm and below, and age 1year or less are associated with a significantly higher likelihood of cerumen retention or impaction.
writing the discussion

1. compact the conclusion

summarize the most important finding
conclusion of the primary outcome

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DISCUSSION

Our results showed statistically significant associations between age and average EAC diameter; age and presence of cerumen retention or impaction; and EAC diameter and presence of cerumen retention or impaction among persons with DS in the Philippines.

The importance of cerumen impaction lies in its deleterious effect on linguistic, social, and intellectual development brought about by conductive hearing loss or impairment.\(^4\) It is a common ORL condition that affects millions of people worldwide. Annually, around 8 million patients in America\(^5\) and 2.3 million patients in the United Kingdom\(^4\) undergo procedures to address cerumen problems. In persons with DS, however, it is under-recognized and undertreated by physicians and parents alike.\(^1\)

In the Philippines, the prevalence of cerumen impaction in the general population ranges from 11% to 27%.\(^6,7\) Our study shows that the prevalence rate of cerumen impaction and retention in Filipinos with Down Syndrome is remarkably higher at 63.5%.

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Otologic problems of persons with DS are multiple, with EAC stenosis among the more obvious. The average EAC diameter in the general Filipino population is approximately 8mm x 7mm for both males and females. In neighboring Taiwan, the average EAC diameter in the general population is approximately 9mm x 6mm.

Although no universally accepted definition of stenosis has been established, a study of patients with congenital aural stenosis defined stenosis as a canal diameter of 4mm or
Although no universally accepted definition of stenosis has been established, a study of patients with congenital aural stenosis defined stenosis as a canal diameter of 4mm or less. This diameter was selected due to the noted absence of cholesteatoma formation in patients with EAC diameters exceeding this value.\textsuperscript{10} Using this definition, we determined the prevalence rate of EAC stenosis in our study population to be 72%. This is notably higher than the published prevalence rates of 38% and 50% in persons with DS elsewhere.\textsuperscript{11,12} Furthermore, in our study population, those with EAC stenosis (EAC diameters $\leq$ 4 mm) had a significantly higher likelihood of having cerumen impaction or retention.

Persons with DS are known to have a higher prevalence of low-set ears. Seventy-nine percent of our study population had low-set ears, and this finding was statistically proven to be associated with increased odds of having cerumen problems (OR = 2.7, $p = .04$). Whether this may be related to the relationship of embryologic pinna and EAC development remains to be seen. Meanwhile, our results suggest that a low-lying pinna among persons with DS may be associated with an underlying EAC, or even middle ear problem.
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Although other otologic examination findings had low prevalences in the study population with no apparent trends with regards to the presence of cerumen problems, they may provide interesting reflection points.

Dull-appearing tympanic membranes with middle ear effusion were seen in 21 ears (8%). This finding is important to note as middle ear effusion causes hearing loss and as a potential consequence, delay in speech development.\textsuperscript{13} However, this rate is remarkably lower than those in previous studies with prevalences as high as 60\%.\textsuperscript{11,13} Whether this reflects the experientially lower prevalence of otitis media with effusion (as well as rhinosinusitis and adenotonsillitis) among the pediatric population in tropical settings like the Philippines (compared to cold-season variations in temperate climates) may be a subject for further inquiry.
Not dissimilar to the low prevalence rate of 8% in published literature, only 5 ears (2%) had retracted TMs, and 26 ears (10%) had non-mobile TMs. Exact etiologies were not established during examination, but possible causes (other than failure to obtain a seal between speculum and EAC) include the increased prevalence of upper respiratory tract infections in this population due to their immunocompromised status subsequently causing middle ear effusion, anatomic variations such as anomalous insertion of the Eustachian tube (ET) into the nasopharynx and the resultant ET dysfunction, and generalized hypotonia and decreased function of the tensor veli palatini muscle.
writing the discussion

4. limitations and caveats to this study

study population?
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Our study limitations include design bias. Of the 194 persons with DS who attended the multidisciplinary free clinic, the 130 who consulted the otorhinolaryngology clinic were more likely to have problems with their ears than those who did not consult the ORL clinic at all. However, all those who consulted at the otorhinolaryngology clinic underwent ear evaluation, regardless of whether or not they had ear-related complaints.

We are also limited by ascertainment bias. The subject sample may not fairly represent the larger population of persons with DS to which the results may be applied, but the consecutive sampling employed, including persons with DS who did not have otologic complaints, may minimize this bias.

To the best of our knowledge, this is the first study to explore the association of age, external auditory canal diameter and cerumen retention or impaction among Asians in general and Filipino children in particular, with Down Syndrome. Aside from providing baseline normative values, identification of such an association can influence the formulation of guidelines for otologic and audiologic assessment in this population.
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CONCLUSIONS

Our study showed a high prevalence of cerumen retention or impaction in Filipinos with DS compared to the general Philippine population, and a remarkably higher prevalence rate for EAC stenosis than elsewhere; in particular, an EAC diameter
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copy and paste the 1st paragraph of discussion
paraphrase the paragraph
does it have a concise and consistent message?

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So Did We Tell A Good Story?

4 key sentences (storyboarding)
- take the first and last sentences of the introduction
- take the first and last sentences of the discussion
- do you have a clear narrative?

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Down Syndrome (DS) is the most common chromosome abnormality in children, with an incidence of 1 in 700 livebirths and has been associated with external auditory canal (EAC) stenosis, predisposing to cerumen retention and impaction, which may in turn lead to conductive hearing loss. To the best of our knowledge, there are no published studies in the English literature on the natural history of ear canal stenosis, but up to 50% of newborns with DS are said to have EAC stenosis, and a significant number require cerumen cleaning.

Although the current recommendation is for persons with DS to undergo otologic assessment every three months until the age of 3 to allow sufficient widening of the EAC and lessen impaction episodes, the association of EAC diameter, age, and cerumen retention and impaction in persons with DS has not been adequately elucidated. A comprehensive English literature search of MEDLINE (PubMed), EMBASE and HERDIN using the keywords external auditory canal stenosis, Down Syndrome, Trisomy 21, Otolaryngology, cerumen retention and/or cerumen impaction yielded no previous studies showing that such an association exists. Moreover, it has not been established whether cerumen impaction or retention increases or decreases at a particular age or EAC diameter.

In this study, we explore the possible association between ear canal dimensions and ages of persons with DS and the presence of cerumen. We hypothesize that at a certain diameter and age, cerumen problems decrease significantly. Our study aims to determine the association between age and average EAC diameter; between age and cerumen retention or impaction; and between EAC diameter and cerumen retention or impaction among persons with Down Syndrome in the Philippines.
Our results showed statistically significant associations between age and average EAC diameter; age and presence of cerumen retention or impaction; and EAC diameter and presence of cerumen retention or impaction among persons with DS in the Philippines.

The importance of cerumen impaction lies in its deleterious effect on linguistic, social, and intellectual development brought about by conductive hearing loss or DS in the Philippines and elsewhere, as well as among other populations expected to have relatively small EAC diameters. Future studies may scout for similar trends and seek to establish critical EAC diameters in the general pediatric population and children.

Our study showed a high prevalence of cerumen retention or impaction in Filipinos with DS compared to the general Philippine population, and a remarkably higher prevalence rate for EAC stenosis than elsewhere; in particular, an EAC diameter of \( \leq 4 \) mm and age \( \leq 1 \) year are associated with a significantly higher likelihood of cerumen retention or impaction.
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