

## PEER REVIEW HISTORY

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### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Attitudes and behaviours of adolescents towards antibiotics and self-care for respiratory tract infections: A qualitative study.
<b>AUTHORS</b>	Hawking, Meredith; Lecky, Donna; Touboul, Pia; Aldigs, Eman; Abdulmajed, Hind; Ioannidou, Eleni; Hadjichambi, Demetra; Khouri, Pauline; Gal, Micaela; Hadjichambis, Andreas; Mappouras, Demetrios; McNulty, Clodna

### VERSION 1 - REVIEW

<b>REVIEWER</b>	Christie Cabral University of Bristol, UK
<b>REVIEW RETURNED</b>	19-Dec-2016

<b>GENERAL COMMENTS</b>	<p>The design is unclear - it starts off by saying it's a thematic analysis as if it were an analysis of secondary data, the elements are all there, it just needs reordering to set out theoretic underpinning (TPB), methodological approach (qualitative), data collection methods (interview &amp; focus group) and then data analysis (thematic).</p> <p>Methods: Some more detail about how the TPB influenced data collection and analysis is needed. Exploring the key constructs is clear but how was the behaviour 'use antibiotics appropriately' defined? Surely the 'behaviour' is to take or not take antibiotics while the term 'appropriately' is subjective, different countries will have different guidelines on what is clinically 'appropriate' and the date within the papers demonstrates that different countries had different social norms with regards to what was 'appropriate'. Would it be more accurate to describe the behaviour as 'seek treatment' as this would cover both going to GP (in UK) or buying antibiotics from pharmacy in Cyprus?</p> <p>The 'triangulation' is really comparison with data from the same study gathered in other countries and sits rather awkwardly within the paper. It would be a much stronger paper if these were incorporated into one paper reporting on what is really a multi-country study.</p> <p>Results: Could the individual identifiers give us a bit more information about the participant being quoted – e.g. Urban/Rural, science or non-science student (using some kind of code so it doesn't get too long)?</p> <p>Discussion: It needs to be a bit clearer that the lack of understanding and types of misperceptions found among participants in this study are found by almost all other qualitative work on this. The nice new element here is the contemporary comparison across 4 countries and differences observed between science and non-science students. This latter is particularly interesting as in studies of adults, lack of</p>
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	understanding is often linked to low educational attainment. In this study we can see that in the UK system at least, it would be possible to have a high education attainment, but having followed a non-science route from 6th form, still have a very poor understanding of the science needed to understand AMR & antibiotic prescribing.
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<b>REVIEWER</b>	Antje Lindenmeyer University of Birmingham, UK
<b>REVIEW RETURNED</b>	19-Jan-2017

<b>GENERAL COMMENTS</b>	<p>This is a clearly designed and reported study in a very important area of research. I would very much like to see the paper published but have a few suggestions for additional information that may improve the article:</p> <p>The introduction could have a brief summary of qualitative findings from studies looking at adults' perception of antibiotics; the authors mention that such research exists but a few lines summarising the main results, and a suggestion of how adolescents might be different would be useful (their uniqueness as a population who may or may not be in charge of their own medication is well described).</p> <p>It looks as if participating was voluntary but did any adolescents approached by the study coordinator actually decline?</p> <p>The cross-country triangulation is potentially very valuable but there is very little detail in the main text about the data collected. This information is in a supplementary file but a brief summary would be beneficial in the main text, especially to describe how researcher approached the comparison of results across different languages or cultural areas e.g. discussion among the collaborators or other comparative methods. It would also be interesting to know whether some of the UK adolescents had experiences of taking antibiotics outside the UK e.g. due to migration if this information is available.</p> <p>Findings are very interesting, especially the difference between scientifically-minded students and others; they focus on knowledge and understanding but it would also be interesting to find out about the 'social' aspect of prescribing/ receiving antibiotics eg feeling that something is 'being done'; one participant said that it was a sign that 'the end' of the illness process was nearing. Were there differences between students feeling that ABs should be taken quickly to avoid illness getting worse, or as a last result when illness does not go away?</p> <p>As the research is informed by the Theory of Planned Behaviour, there could be a brief description of what participants' intentions related to antibiotic taking were and what they felt could influence them? A lot of this is implicit e.g. looking at parents' involvement but could be made more explicit.</p>
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### VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Christie Cabral

Institution and Country: University of Bristol, UK Please state any competing interests or state 'None

declared': None declared

Please leave your comments for the authors below This is an interesting study of adolescent views which are currently under-represented in the literature. With revision, this study could provide a useful addition to the literature.

Abstract:

The design is unclear - it starts off by saying it's a thematic analysis as if it were an analysis of secondary data, the elements are all there, it just needs reordering to set out theoretic underpinning (TPB), methodological approach (qualitative), data collection methods (interview & focus group) and then data analysis (thematic).

Author's response: The order of this section has been rewritten to address this comment. Please see page 3.

Methods:

Some more detail about how the TPB influenced data collection and analysis is needed. Exploring the key constructs is clear but how was the behaviour 'use antibiotics appropriately' defined? Surely the 'behaviour' is to take or not take antibiotics while the term 'appropriately' is subjective, different countries will have different guidelines on what is clinically 'appropriate' and the data within the papers demonstrates that different countries had different social norms with regards to what was 'appropriate'. Would it be more accurate to describe the behaviour as 'seek treatment' as this would cover both going to GP (in UK) or buying antibiotics from pharmacy in Cyprus?

Author's response: We have added more detail on how we used the TPB to design the topic guide and how it may have impacted the thematic analysis in this section. We agree with your comments here and therefore have changed this section to make clear that the behaviour being addressed is 'taking antibiotics' to encapsulate the different norms in different countries. Please see page 7 'study design' section for these changes.

The 'triangulation' is really comparison with data from the same study gathered in other countries and sits rather awkwardly within the paper. It would be a much stronger paper if these were incorporated into one paper reporting on what is really a multi-country study.

Author's response: Due to cultural differences and differences in the education systems, recruitment was different in each country. In France, participants were recruited via a youth health clinic rather than through schools, and in Saudi Arabia female researchers were not able to recruit males from schools and therefore male recruitment and data collection occurred via personal networks outside of an educational setting. The sample sizes in each country were different, as well as the use of focus groups to collect data, which only took place in the UK and Saudi Arabia. Due to these differences we as authors are not confident to present the findings together in a single paper. We felt that due to these circumstances, triangulation was more appropriate. However, as we have reported, we did not find substantial differences between the findings from each country and believe that the inclusion of this country comparison allows readers to be more informed in their assessments of the transferability of our findings, hence we have reported it and included the comparison in the paper. In light of this, and in line with the comment from the other BMJ Open reviewer about this section, we will provide more detail about the samples and data collection from the other countries in the main body of the paper to allow readers to judge for themselves without accessing the supplementary file, but without changing the overall structure of the paper. We hope you agree that this is a justified decision. Please see page 10 for this updated section.

Results:

Could the individual identifiers give us a bit more information about the participant being quoted – e.g. Urban/Rural, science or non-science student (using some kind of code so it doesn't get too long)?

Author's response: This additional information has now been included with the quotes, and an explanation of the code used has been included. See page 10 for an explanation of the codes used.

Discussion:

It needs to be a bit clearer that the lack of understanding and types of misperceptions found among participants in this study are found by almost all other qualitative work on this. The nice new element here is the contemporary comparison across 4 countries and differences observed between science and non-science students. This latter is particularly interesting as in studies of adults, lack of understanding is often linked to low educational attainment. In this study we can see that in the UK system at least, it would be possible to have a high education attainment, but having followed a non-science route from 6th form, still have a very poor understanding of the science needed to understand AMR & antibiotic prescribing.

Author's response: We have added to the discussion in the 'comparison to other research' section (Pages 19-21) to reflect these insightful comments.

Reviewer: 2

Reviewer Name: Antje Lindenmeyer

Institution and Country: University of Birmingham, UK Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below This is a clearly designed and reported study in a very important area of research. I would very much like to see the paper published but have a few suggestions for additional information that may improve the article:

The introduction could have a brief summary of qualitative findings from studies looking at adults' perception of antibiotics; the authors mention that such research exists but a few lines summarising the main results, and a suggestion of how adolescents might be different would be useful (their uniqueness as a population who may or may not be in charge of their own medication is well described).

Author's response: We have added a few lines to include this information here and improve this section. Please see page 5, paragraph 2.

It looks as if participating was voluntary but did any adolescents approached by the study coordinator actually decline?

Author's response: Participants volunteered to take part, and once they were enrolled in the study three dropped out due to illness. We do not have information on participants who declined to take part – it is likely that those students who didn't want to take part just didn't sign up. We have clarified this in the paper on page 8, 'setting and participants' section.

The cross-country triangulation is potentially very valuable but there is very little detail in the main text about the data collected. This information is in a supplementary file but a brief summary would be beneficial in the main text, especially to describe how researcher approached the comparison of results across different languages or cultural areas e.g. discussion among the collaborators or other comparative methods.

Author's response: We have provided more detail in the main body of the paper to address this

comment and improve this aspect of the paper. Please see page 10.

It would also be interesting to know whether some of the UK adolescents had experiences of taking antibiotics outside the UK e.g. due to migration if this information is available.

Author's response: We agree this would be interesting however we did not collect this information and therefore unfortunately cannot report on this.

Findings are very interesting, especially the difference between scientifically-minded students and others; they focus on knowledge and understanding but it would also be interesting to find out about the 'social' aspect of prescribing/ receiving antibiotics eg feeling that something is 'being done'; one participant said that it was a sign that 'the end' of the illness process was nearing. Were there differences between students feeling that ABs should be taken quickly to avoid illness getting worse, or as a last result when illness does not go away?

Author's response: Students mainly discussed consulting for, and expecting antibiotics when they felt an infection was categorised as 'serious', rather than the stage of the illness (for instance taking them quickly, versus towards the end of the illness episode). We have added to the discussion some reflections on the significance of receiving a prescription of antibiotics, of taking positive action, and how this can relate to driving up antibiotic use. Please see pages 19-20.

As the research is informed by the Theory of Planned Behaviour, there could be a brief description of what participants' intentions related to antibiotic taking were and what they felt could influence them? A lot of this is implicit e.g. looking at parents' involvement but could be made more explicit.

Author's response: Thank you for highlighting this. We have made more explicit how the findings influenced intentions of the participants in the results section on pages 13-16.

We hope that you agree that these changes have improved the paper and look forward to receiving your editorial decision in due course.

#### **VERSION 2 – REVIEW**

<b>REVIEWER</b>	Antje Lindenmeyer University of Birmingham, UK
<b>REVIEW RETURNED</b>	14-Mar-2017

<b>GENERAL COMMENTS</b>	This is much clearer now and the main issues pointed out in the review are resolved. I would recommend to accept but the authors should organise a final proofread--there are some highly visible typos e.g. 'principle findings'.
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