Theoretical approaches in the development and evaluation of behaviour change interventions that improve clinicians' antimicrobial prescribing: a systematic review.

TALKHAN, H., CUNNINGHAM, S., STEWART, D., ZIGLAM, H., AL HAIL, M., MCINTOSH, T., DIAB, M. and ABDULROUF, P. 2019
Theoretical approaches in the development and evaluation of behaviour change interventions that improve clinicians’ antimicrobial prescribing: a systematic review

Hend Talkhan, BSc (Pharm), PGCert (Distinction)  
PhD Candidate  
Robert Gordon University  
Aberdeen, UK
Background: antimicrobials

- Antimicrobials add 20 years to life expectancy\(^1\)
- Several decades of medical advances are threatened by the global rise of antimicrobial resistance (AMR) – the ability of microorganisms to resist the effects of antimicrobials\(^2\)
- No new classes of antimicrobials have been discovered since the 1980s\(^3\)
- Resistant microorganisms respect no borders, neither geographical nor ecological\(^3\)
Deaths attributable to AMR each year compared to other major causes of death globally\(^4\)

AMR’s economic implication on global Gross Domestic Product (GDP), in trillions of USD ($T)\(^4\)
Background: antimicrobial stewardship

• Many countries have developed antimicrobial stewardship (AMS) programmes
  – interventions designed to improve antimicrobial prescribing and use, minimise AMR and improve patient outcomes

• Challenges
  – ongoing inappropriate prescribing of antimicrobials and increasing levels of resistance globally
  – need for behaviour change interventions at clinicians’ levels to improve prescribing practices
• Behaviour change interventions tend to be complex and challenging

• Theories provide a useful basis for developing and evaluating interventions to change human behaviour
  – enhance the robustness, rigour and impact of research findings
  – maximise the effectiveness of behaviour change interventions
  – enable understanding of why and how behaviour change occurs
Qatar profile

- A country located on a small peninsula in the Middle East
- One of the highest per capita income countries in the world\(^9\)
- Expenditure on healthcare is among the highest in the Middle East\(^9\)
- The National 2030 Vision aims at a world-class healthcare system\(^{10}\)
PhD overview

• Aim
  – identify, quantify and explore clinicians’ behavioural determinants of antimicrobial prescribing in Hamad Medical Coronation (HMC), Qatar

• Methods
  – Phase 1: Systematic review of literature
  – Phase 2: Cross-sectional survey of HMC clinicians
  – Phase 3: Semi-structured interviews with respondents

• Theory
  – the Theoretical Domains Framework\textsuperscript{11}
Critically appraise, synthesise and present the existing evidence for theoretical approaches in the development and evaluation of behaviour change interventions designed to improve clinicians’ antimicrobial prescribing.
Systematic review questions

1. Which theories have been used and why?
2. How and to what extent have these theories informed development of interventions?
3. How and to what extent have these interventions been feasibility/pilot tested?
4. To what extent have these interventions been evaluated and what outcomes have been reported?

The UK Medical Research Council framework for development and evaluation of complex interventions\textsuperscript{6}
Methods: review characteristics

- English language
- Primary literature
- All study designs
- Aligns with aim
- PubMed
- Medline
- CINAHL, IPA
- PsycINFO
- ScienceDirect
- No theoretical basis
- Grey literature
- Use of theory
- Feasibility
- Evaluation

Inclusion criteria

Databases searched

Exclusion criteria

Outcomes of interest
# Methods: Search Strategy

<table>
<thead>
<tr>
<th>Concepts</th>
<th>Sub-terms</th>
<th>Search Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Antimicrobial agents</strong></td>
<td>1.1 Antimicrob*</td>
<td>TI OR AB</td>
</tr>
<tr>
<td></td>
<td>1.2 Antibiotic*</td>
<td>TI OR AB</td>
</tr>
<tr>
<td></td>
<td>1.3 Anti-bacterial agents</td>
<td>MeSH+</td>
</tr>
<tr>
<td></td>
<td>1.4 Anti-infective agents</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Antifungal agents</td>
<td>MeSH+</td>
</tr>
<tr>
<td></td>
<td>• Antiparasitic agents</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Antiviral agents</td>
<td></td>
</tr>
<tr>
<td><strong>2. Prescribing</strong></td>
<td>2.1 Prescrib*</td>
<td>TI OR AB</td>
</tr>
<tr>
<td></td>
<td>2.2 Therapeutics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Inappropriate prescribing</td>
<td>MeSH+</td>
</tr>
<tr>
<td></td>
<td>• Drug prescriptions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Deprescriptions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Medication errors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.3 Delivery of health care</td>
<td>MeSH+</td>
</tr>
<tr>
<td></td>
<td>• Practice patterns, physicians’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Practice patterns, nurses’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Professional practice gaps</td>
<td></td>
</tr>
<tr>
<td><strong>3. Theory</strong></td>
<td>3.1 Theor*</td>
<td>TX All Text</td>
</tr>
<tr>
<td></td>
<td>3.2 Principle*</td>
<td>TX All Text</td>
</tr>
<tr>
<td></td>
<td>3.3 Construct*</td>
<td>TX All Text</td>
</tr>
<tr>
<td></td>
<td>3.4 Framework*</td>
<td>TX All Text</td>
</tr>
<tr>
<td></td>
<td>3.5 Concept*</td>
<td>TX All Text</td>
</tr>
<tr>
<td></td>
<td>3.6 Psychological phenomena and processes</td>
<td>MeSH+</td>
</tr>
<tr>
<td></td>
<td>3.7 Behavior</td>
<td>MeSH+</td>
</tr>
<tr>
<td><strong>4. Interventions</strong></td>
<td>4.1 Intervention*</td>
<td>TX All Text</td>
</tr>
</tbody>
</table>
Methods: quality assessment, data extraction and synthesis

• Quality assessment
  – CONSORT\textsuperscript{13}, STROBE\textsuperscript{14} and COREQ\textsuperscript{15}
  – Theory Coding Scheme (TCS)\textsuperscript{8}

• Data extraction
  – authors, year, country of origin, study design, aim/objectives, healthcare setting, participants, medical condition, intervention, theory and key findings

• Data synthesis
  – narrative approach
Results: PRISMA chart

Identification
- Records identified through database searching (n = 7311):
  - PubMec (n = 3545)
  - Medline (n = 3209)
  - CINHAL (n = 480)
  - IPA (n = 33)
  - ScienceDirect (n = 33)
  - PsycINFO (n = 21)

Screening
- Records after 3094 duplicates removed (n = 4227)
- Record titles and abstracts screened (n = 4227)

Eligibility
- Full-text articles assessed for eligibility (n = 38)
- Studies included in narrative synthesis (n = 6 studies, 10 papers)
  - Development papers (n = 4)
  - Feasibility/Pilot testing papers (n = 1)
  - Evaluation papers (n = 5)

Additional records (n = 10):
- Google Scholar (n = 2)
- SR reference lists (n = 5)
- email alerts (n = 3)

Records excluded (n = 4189):
- not related to prescribing behaviour (n = 2345)
- not theoretically based intervention (n = 1310)
- not primary literature (n = 534)

Full-text articles excluded (n = 28):
- not theoretically based
- not related to prescribing behaviour (n = 8)
- no clear theoretical basis (n = 5)
- not related to clinicians (n = 3)
- not primary literature (n = 3)
Results: preliminary findings

• Studies were conducted in **UK** (n=8), Canada (n=1) and Sweden (n=1)
• Most employed **quantitative** designs (n=6), with fewer qualitative (n=3) and mixed-methods (n=1) designs
• Most were carried out in **primary care settings** (n=9), targeting **respiratory tract infections** (n=8)
• Main professions targeted were **doctors** (n=10) and **nurses** (n=4)
• Theoretical approaches **varied** across studies
• There was **no** optimal use of theory as recommended in the TCS
Conclusion and discussion

• The **first** to investigate theoretically based behaviour change interventions designed to improve clinicians’ antimicrobial prescribing
• Few studies were identified; most were suboptimal
• **None** was from the Middle East and **none** targeted pharmacists
• There is an **urgent** need for better quality, primary research in this area
References


References


12. Talkhan H, Cunningham S, Stewart D, McIntosh T, Al Hail M, Abdul Rouf P and Ziglam H. The application and use of theory in the development and evaluation of behaviour change interventions designed to improve clinicians’ antimicrobial prescribing: a systematic review protocol. PROSPERO. 2018;CRD42018098586.


Questions?

I think I need antibiotics for my col...

IT'S A VIRUS!