

Near East University
Faculty of Pharmacy

PHA501 Graduation Project

Prepared by: Dr. Duygu Yiğit Hanoğlu
Dr. Azmi Hanoğlu

Overview of a Research

**Searching, Reading and
Understanding
Literature**

Scientific Searching Sources



A service of the [U.S. National Library of Medicine](#) and the [National Institutes of Health](#)

PubMed
www.pubmed.gov

All Databases PubMed Nucleotide Protein Genome Structure OMIM

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Keywords

Author name

Journal/book title

Volume

Issue

Paç



Advanced search



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Medicines

Human regulatory

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National registers

Medicines for use outside the EU

NIH U.S. National Library of Medicine

ClinicalTrials.gov



Scopus

Three Types of Resources:

✓ **Primary**

✓ **Secondary**

✓ **Tertiary**

Primary Resources

- **Original research articles**

- Many kinds of study designs
- Clinical trials
- Cohort studies
- Meta-analyses

- **Conference Papers/Posters**

- **Dissertations**

- **Patents**

Advantages of primary sources:

Current information

May be only source of info on a new drug

Narrow in scope

Disadvantages of primary sources:

Limited in scope

Complex, hard to interpret

Secondary Resources

- Review articles
 - Literature reviews
- Guidelines
- Indexing sources
- Abstracting sources

Literature Reviews

Advantages:

Many primary resources consulted to write 1 article

Disadvantages:

Need to examine sources included closely

Potential for bias in selection

Guidelines

Advantages:

Many primary resources consulted to write 1 guideline
Functionally oriented for clinical work (bullet points, not narrative)

Disadvantages:

Can only be created when a critical mass of primary studies are available

Secondary Resources

- Indexing sources
 - PubMed@USC
 - International Pharmaceutical Abstracts
- Abstracting sources
 - FDA's MedWatch

Advantages:

Indexing sources create computerized records with additional information to make primary sources easier to find

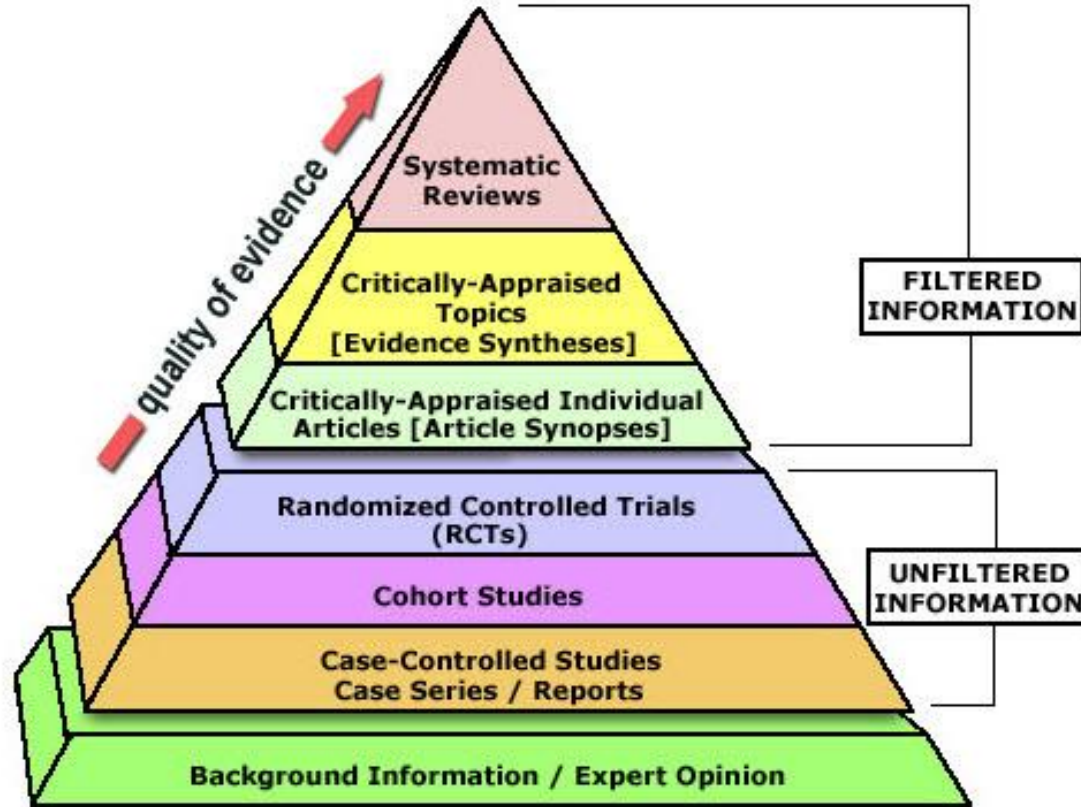
Abstracting services provide up-to-date information

Disadvantages:

Need to pay for access (for most)

Don't include full-text of the primary source

Hierarchy of Evidence



Tertiary Resources

- **Textbooks**
- **Handbooks**
- **Drug Compendia**
- **Reference books**

Hint: Pro pharmacists consult two or more tertiary resources to check their answer!

Advantages of tertiary sources:

Comprehensive information from a variety of sources

Citations to primary and secondary sources

Fast, easy to use

Disadvantages of tertiary sources:

Older, less current information

Not sure if authors looked at the “right” sources

Which ones do I use?

Consult in backwards order!

Tertiary → **Secondary** → **Primary**

Tertiary resources when:

- The answer to a question is basic factual knowledge in the field
- The question was studied extensively and a conclusion was made
- Many experts have addressed the question and agree on answer

Secondary and primary resources when:

- A question is new and has never been studied
- There is no consensus among experts; various opinions abound
- There is conflicting evidence and the question needs further study

Performing “a successful search”

- Decide the **right key words** of your topic,
- Decide **what to do next** if something goes wrong
- Learn how to use your University’s Library Opportunities of reaching to articles, books etc.

= **Connect from your University IP to reach registered journals.**

OR

= **Learn from NEU Library “Off Campus Access”**

*“To be able to reach the NEU Grand Library Electronic Resources, you will need to **send an email to library@neu.edu.tr** and request for an username and password.”*

MeSH (Medical Subject Headings)



- ✓ MeSH contains approximately 26 thousand terms and is updated annually to reflect changes in medicine and medical terminology.
- ✓ **MeSH terms are arranged hierarchically by subject categories** with more specific terms arranged beneath broader terms.

Searching on MeSH



Search Tree View MeSH on Demand MeSH 2020 MeSH Suggestions About MeSH Browser Contact Us

Medical Subject Headings 2021

The files are updated each week day Monday-Friday by 8AM EST

Search MeSH...

FullWord ▾ **Exact Match** All Fragments Any Fragment

All Terms

Main Heading (Descriptor) Terms

Qualifier Terms

Supplementary Concept Record Terms

MeSH Unique ID

Search in all Supplementary Concept Record Fields

Heading Mapped To

Indexing Information

Pharmacological Action

Search Related Registry and CAS Registry/EC Number/UNII Code (RN)

Related Registry Search

CAS Registry/EC Number/UNII Code (RN)

Search in all Free Text Fields

Annotation

ScopeNote

SCR Note

Sort by: Relevance ▾

Results per Page: 20 ▾

<https://meshb-prev.nlm.nih.gov/search>

A MeSH Tree Example for a Main Title named as “Chemical and Drugs”

Chemicals and Drugs [D] -

Inorganic Chemicals [D01] +

Organic Chemicals [D02] +

Heterocyclic Compounds [D03] +

Polycyclic Compounds [D04] +

Macromolecular Substances [D05] +

Hormones, Hormone Substitutes, and Hormone Antagonists [D06] +

Enzymes and Coenzymes [D08] +

Carbohydrates [D09] +

Lipids [D10] +

Amino Acids, Peptides, and Proteins [D12] +

Nucleic Acids, Nucleotides, and Nucleosides [D13] +

Complex Mixtures [D20] +

Biological Factors [D23] +

Biomedical and Dental Materials [D25] +

Pharmaceutical Preparations [D26] -

Controlled Substances [D26.049]

Cosmeceuticals [D26.074]

Dosage Forms [D26.255] +

Drug Combinations [D26.310] +

Drugs, Chinese Herbal [D26.335]

Drugs, Essential [D26.355]

Drugs, Generic [D26.360]

Drugs, Investigational [D26.371]

Materia Medica [D26.526]

Medical Marijuana [D26.528]

Nonprescription Drugs [D26.530] +

Nostrums [D26.593]

Pharmaceutic Aids [D26.650] +

Pharmaceutical Preparations, Dental [D26.655]

Placebos [D26.660]

Plant Extracts [D26.667] +

Prescription Drugs [D26.670]

Prodrugs [D26.675]

Solutions [D26.776] +

Illicit Drugs [D26.878] +

Substandard Drugs [D26.894] +

Synthetic Drugs [D26.909] +

Veterinary Drugs [D26.939]

Xenobiotics [D26.969]

Chemical Actions and Uses [D27] +

Anatomy of the Search results

- [Policy Issues in the Development and Adoption of Biomarkers for Molecularly Targeted Cancer Therapies: Workshop Summary.](#)
 1. National Cancer Policy Forum, Board on Health Care Services, Institute of Medicine.
Washington (DC): National Academies Press (US); 2015.
PMID: 25855848 [Free Books & Documents](#)
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journal title
abbreviation

title
- [Four-wave mixing experiments with extreme ultraviolet transient gratings.](#)
 2. Bencivenga F, Cucini R, Capotondi F, Battistoni A, Mincigrucci R, Gianfrisostomi E, Gessini A, Manfreda M, Nikolov IP, Pedersoli E, Principi E, Svetina C, Parisse P, Casolari F, Danailov MB, Kiskinova M, Masciovecchio C. Nature. 2015 Apr 9;520(7546):205-8. doi: 10.1038/nature14341.
PMID: 25855456
[Similar articles](#)

authors

volume & issue

e-pagination
- [Molecular imaging of angiogenesis after myocardial infarction by \(111\)In-DTPA-cNGR and \(99m\)Tc-sestamibi dual-isotope myocardial SPECT.](#)
 3. Hendrikx G, De Saint-Hubert M, Dijkgraaf I, Bauwens M, Douma K, Wiertz R, Pooters I, Van den Akker NM, Hackeng TM, Post MJ, Mottaghy FM. EJNMMI Res. 2015 Jan 28;5:2. doi: 10.1186/s13550-015-0081-7. eCollection 2015.
PMID: 25853008 [Free PMC Article](#)
[Similar articles](#)

publicaton date

Parts of An Article

- ***Title and Authors***
- ***Abstract*** - The abstract provides a very brief summary of the research.
- ***Introduction*** - The introduction sets the research in a context, which provides a review of related research and develops the hypotheses for the research.
- ***Method*** - The method section describes how the research was conducted.
- ***Results*** - The results section describes the outcomes of the study.
- ***Discussion*** - The discussion section contains the interpretations and implications of the study.
- ***References*** - A references section lists the articles, books, and other material cited in the report.

Anti-*Helicobacter pylori* Activities of Six Iranian Plants

Farahnaz Nariman,*† Fereshteh Eftekhari,* Zohreh Habibi* and Tahereh Falsafit

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ABSTRACT



Background. *Helicobacter pylori* is the major worldwide cause of bacterial gastrointestinal infections in adults and children. Antibiotic therapy and a combination of two or three drugs have been widely used to eradicate these infections. However, development of drug resistance in bacteria calls for new sources of drugs, and plants seem to be a logical source of new antibacterial compounds.

Methods. The anti-*H. pylori* activities of six native Iranian plants (*Glycyrrhiza aspera*, *Juglans regia*, *Ligustrum vulgare*, *Thymus kotschyanus*, *Trachyspermum copticum* and *Xanthium brasiliicum*) and seven antibiotics were determined against 70 clinical isolates from children using the disk susceptibility assay. Minimum inhibitory concentrations were also measured for the biologically active extracts. One extract with the best anti-*H. pylori* activity was fractionated by silica gel and thin layer chromatography

and the active compounds were identified by hydrogen nuclear magnetic resonance (¹HNMR) spectroscopy.

Results. All plant extracts showed anti-*H. pylori* activity by the disk sensitivity method, but the most active extracts were those from *X. brasiliicum* and *T. copticum*. In fact, the anti-*H. pylori* activities of the two extracts were superior to the disk antibiotic susceptibility profile. Minimum inhibitory concentrations were within the range of 31.25–250 µg/ml. Fractionation and chemical identification of the extract from *X. brasiliicum* showed the presence of two substances, a flavonoid and a xanthanolide.

Conclusion. Due to the rise in antibiotic resistance, new sources of anti-*H. pylori* drugs are needed. The use of medicinal plants and/or their chemical components may have potential benefit in eradicating such problems.

Keywords. Anti-*Helicobacter pylori*, Iranian plants.



Chemical composition and antimicrobial activity of the essential oil of *Sideritis cypria* Post endemic in Northern Cyprus

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ABSTRACT

In this study, chemical composition and antimicrobial activity of the essential oil of *Sideritis cypria*, which is an endemic taxon in Northern Cyprus, were investigated. The essential oil obtained by hydrodistillation were analyzed by gas chromatography (GC) and gas chromatography-mass spectrometry (GC-MS). In general, the GC and GC-MS analysis illustrated that fifty compounds were identified representing 96.9% of the oil. Major components were α -cubebol (11.9%), trans-piperitol (8.9%) and pinene (8.1%), respectively. The antimicrobial activity of the essential oil was tested by disc diffusion method against *Pseudomonas aeruginosa* (ATCC 27853), *Escherichia coli* (ATCC 25922), *Bacillus cereus* (ATCC 10876), *Staphylococcus aureus* (ATCC 25923) bacteria and *Candida albicans* (ATCC 90028) yeast. The results showed that the inhibition zone of *S. cypria* essential oil against *C. albicans* at maximum dose (10 μ l) was higher than positive control Nystatin. The oil showed similar inhibitory zone to that of the positive control (TMP-SMX) against *B. cereus* at maximum dosage 10 μ l. In addition, the inhibitory effect of the oil against *E. coli* measured only at the 10 μ l as 10.33 ± 0.58 . Furthermore, the inhibition zones against *S. aureus* was ranged from 9.00 ± 2.00 to 24.00 ± 1.73 while *P. aeruginosa* was found to be resistant in all doses.

ARTICLE HISTORY

Received 21 December 2015

Accepted 16 October 2016

KEYWORDS

Essential oil; GC-MS; antimicrobial; Lamiaceae; *Sideritis*

1. Introduction

Thymus (Lamiaceae) is a large genus divided in eight sections, comprising about 215 species particularly prevalent in the Mediterranean area. This genus is represented by eleven species in the flora of Algeria; among them are *Thymus algeriensis* Boiss. et Reut., *Thymus pallescens* de Noé and *Thymus dreatensis* Batt. (Morales, 2002).

T. algeriensis is the most widespread North African species; *T. pallescens* is common and endemic to northern Algeria, while *T. dreatensis* is rare and endemic to the Aures mountains (Batna region) and Djurdjura mountains (Kabylie region) of eastern Algeria (Quezel & Santa, 1963).

T. algeriensis is largely used, fresh or dried, only as a culinary herb, whereas the two other species, mainly *T. pallescens*, are widely used in Algerian folk medicine for their antitussive, antiseptic, expectorant, anti-helminthic and antispasmodic properties.

The chemical compositions have been previously established for *T. algeriensis* (Aboutabl & El-dahmy, 1995; Benjilali, Hammoumi, M'hamedi, & Richard, 1987; Benjilali, Hammoumi, & Richard, 1987; Houmani, Azzoudj, Naxakis, & Skoula, 2002), and for *T. pallescens* (Hazzit, Baaliouamer, Faleiro, & Miguel, 2006), while *T. dreatensis* is assessed for the first time. Except for *T. pallescens*, the antimicrobial and/or the antioxidant activities of these species from Algeria have not been reported before.

Due to the application of *Thymus* species growing wild in Algeria as a culinary herb and in folk medicine, the purpose of the present work was to evaluate the antioxidant and antimicrobial activities of their essential oils and relate them with their chemical composition, for further application in food and pharmaceutical industries as natural valuable products.

* Hazzit, M., Baaliouamer, A., Veríssimo, A. R., Faleiro, M. L., & Miguel, M. G. (2009). Chemical composition and biological activities of Algerian *Thymus* oils. *Food chemistry*, 116(3), 714-721.

1- This part gives a brief information about main topic of article

2- Previous studies on the topic

3- Reason of choosing and working of the topic

4- The value of this work and the outcomes of this work

This part is useful while preparing a HW, presentation or writing the same part of your graduation project

Material and method

Plant materials

Aerial parts comprising stems, leaves and spikes of *S. cypria* endemic to Northern Cyprus were collected from 500–750 m altitude of Southern part of Pentadaktylos (Beşparmak) Mountains during the post-flowering phase in September 2012. Voucher specimens are kept at the Herbarium of the Near East University, Turkish Republic of Northern Cyprus (NEUN) as NEUN 6559.

Isolation of the essential oils

Hundred grams of the air dried aerial parts of the plant material were hydrodistilled with 1L distilled water for 3 hours using a Clevenger-type apparatus. The resulting essential oil was stored at 4°C until the analysis. The oil yields were calculated as w/w. The essential oil yield of *S. cypria* was 0.49%.

GC-MS analysis

The GC-MS analysis was carried out with an Agilent 5975 GC-MSD system. Innowax FSC column (60 m × 0.25 mm, 0.25 µm film thickness) was used with helium as carrier gas (0.8 ml/min). GC oven temperature was kept at 60°C for 10 min and programmed to 220°C at a rate of 4°C/min, and kept constant at 220°C for 10 min and then programmed to 240°C at a rate of 1°C/min. Split ratio was adjusted at 40:1. The injector temperature was set at 250°C. Mass spectra were recorded at 70 eV. Mass range was from *m/z* 35 to 450.

up by genuine compounds and components of known oils, as well as MS literature data (29, 30), was used for the identification.

Antimicrobial assay

The micro-organisms used in this study were: *Pseudomonas aeruginosa* ATCC 27853, *Escherichia coli* ATCC 25922, *Bacillus cereus* ATCC 10876, *Staphylococcus aureus* ATCC 25923 and *Candida albicans* ATCC 90028. All the micro-organisms were obtained from Kwikstik, Microbiologics, France and they have been stored in Near East University Microbiology laboratory under –80°C. Bacterial strains were cultured in Blood Agar Base (Oxoid) and *C. albicans* was cultured in Sabouraud dextrose agar (Oxoid). Positive controls used were as follows: Piperacillin (BD, 100 µg) for *P. aeruginosa*; Trimethoprim/Sulfamethoxazole (TMP-SMX) (BD, 5 mcg) for *B. cereus*, *E. coli*, *S. aureus*; and Nystatin (Oxoid, 100 units) for *C. albicans*.

The *in vitro* antimicrobial activity of the *S. cypria* essential oil was determined by disc diffusion method according to the NCCLS criteria (31). Microorganism strains were grown in Brain Heart Infusion Broth (OXOID) incubated for 24 hours. Briefly, a suspension (0.1 ml of turbidity adjusted to 0.5 Mc Farland Standart) of each microorganisms was spread on the Mueller Hinton Agar homogeneously. Then, empty sterilized antibiotic discs having a diameter of 6 mm (Bioanalyse) were soaked with 0.5, 1, 2, 4 and 10 µl (32, 33) of *S. cypria* essential oil were placed in the middle of the Petri dishes gently. Before measuring the diameters of inhibition zones in millimetres, plates were incubated at 37°C for 24 hours. Positive and negative growth controls were included in every test. A microbial susceptibility control tests were performed in triplicate.

Material Method part could be divided in subheadings.

This part is useful for designing your own project or scientific work and to discuss your own results with other previous results.

* Yiğit Hanoğlu, D., Hanoğlu, A., Güvenir, M., Süer, K., Demirci, B., Başer, K. H. C., & Özkum Yavuz, D. (2016). Chemical composition and antimicrobial activity of the essential oil of *Sideritis cypria* Post endemic in Northern Cyprus. *Journal of Essential Oil Research*, 1-5.

Result(s) and Discussion

- These parts could be written in separately or together depends on the rule of the journal.
- **Results: Gives the obtained data after doing the research of the topic.**
- **Discussion: the obtained results of the work discussed with the previous reports' results.**

Conclusion

- This part gives the outcome of the research
- Some necessary further research topics (The missing data about the related area)

This part is important while deciding your own idea or own research topic is worth or not!

Acknowledgements

The authors are grateful to Dr. Akito Nagatsu (Nagoya City University, Graduate School of Pharmaceutical Sciences, Mizuho-ku, Nagoya, Japan) for FT-ESI-MS, and Dr. Hayri Duman (Gazi University, Faculty of Science, Department of Botany, Ankara, Turkey) for the authentication of the plant specimen.

- This part is not always exist in all articles.
- Gives information about whose funding the research.

This part is important to have an idea about the reliability of the work. (If the funder is the owner of the searched drug ??)

How to Cite

Citation

- **Plagiarism** is an act of fraud. It involves both stealing someone else's work and lying about it afterward.
- **For avoiding plagiarism** “Cite” the information you use.
- **There are lots of citation systems exist :**

Oxford, Harvard, MLA, American Psychological Association (APA) etc.

e.g. For APA style;

Aligiannis, N., Kalpoutzakis, ... Tsarbopoulos, A. (2001). Composition and antimicrobial activity of the essential oils of five taxa of *Sideritis* from Greece. *Journal of Agricultural and Food Chemistry*, 49(2), 811-815.

Futher examples: <https://apastyle.apa.org/style-grammar-guidelines/references/examples/>

How to Write Citation Easily

Google Scholar



Search the article name

Herhangi bir dil Türkçe sayfalarda ara

Google Scholar

Iridoid glucosides from Wendlandia ligustroides (Boiss. &Hohen.) Blakelock



Makaleler

1 sonuç (0,04 sn)

Tüm zamanlar

2020 yılından beri

2019 yılından beri

2016 yılından beri

Özel aralık...

Alakaya göre sırala

Tarihe göre sırala

[HTML] Iridoid glucosides from Wendlandia ligustroides (Boiss. &Hohen.) Blakelock

[İ. Çalış](#), [A. Weas](#), [HS. Yusufoglu](#), [AA. Dönmez](#)... - Saudi Pharmaceutical ..., 2020 - Elsevier

Eight iridoid glucosides were reported from the aerial parts of Wendlandia ligustroides. 10-deoxygeniposidic acid (1), 7-deoxygardoside (2), geniposidic acid (3), 7-deoxy-8-epi-loganic acid (4), deacetyl-daphylloside (5), scandoside methyl ester (6), 6-O-methyl-deacetyl-daphylloside (7), 6-O-methyl-scandoside methyl ester (8). Compounds 3–8 were isolated as a pure form while 1 and 2 as a mixture. The structures of the compounds 1–8 were established by spectroscopic methods including 1D-NMR (1 H NMR, 13 C NMR, DEPT ...

 [sürümün hepsi](#) 

Click on Quotation mark icon

APA format is suitable for citation according to our faculty guidelines.

Copy the APA format by clicking on it.

Iridoid glucosides from Wendlandia ligustroides (Boiss. &Hohen.) Blakelock



1 sonuç (0,04 sn)

[HTML] Iridoid glucosides from Wendlandia ligustroides (Boiss. &Hohen.) Blakelock
İ. Çalış, A Weas, HS Yusufoglu, AA Dönmez... - Saudi Pharmaceutical ..., 2020 - Elsevier
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☆ 2 sürümün bensi >>>



Alıntı yap

MLA Çalış, İhsan, et al. "Iridoid glucosides from Wendlandia ligustroides (Boiss. &Hohen.) Blakelock." *Saudi Pharmaceutical Journal* 28.7 (2020): 814-818.

APA Çalış, İ., Weas, A., Yusufoglu, H. S., Dönmez, A. A., & Jensen, S. R. (2020). Iridoid glucosides from Wendlandia ligustroides (Boiss. &Hohen.) Blakelock. *Saudi Pharmaceutical Journal*, 28(7), 814-818.

ISO 690 ÇALIŞ, İhsan, et al. "Iridoid glucosides from Wendlandia ligustroides (Boiss. &Hohen.) Blakelock." *Saudi Pharmaceutical Journal*, 2020, 28.7: 814-818.

BibTeX

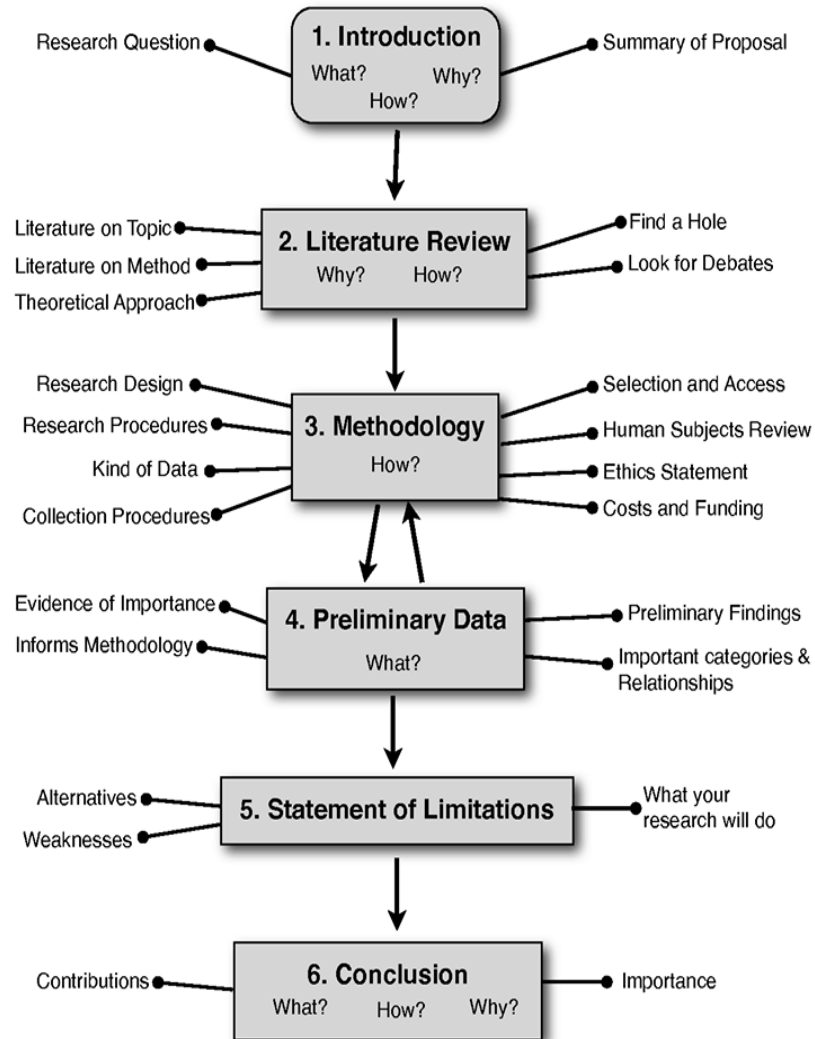
EndNote

RefMan

RefWorks

Designing a Research

Research Proposal Flow Chart



Formulating a focused question

Patient / **P**roblem / **P**opulation

Intervention

Comparison

Outcome

Example Topic

M ▶ Lifestyle ▶ Health

Mums-to-be beware - Give up smoking before you get pregnant

How any woman can run the danger of imposing these risks on her vulnerable unborn baby is beyond me

Mirror



By

Miriam Stoppard

 Tweet

2

 Like

 Send



Focused Question

P: Pregnant smokers

I: Nicotine replacement

C: N/A

O: Cessation

Hypothesis of a research topic:

“Is nicotine replacement therapy an effective and safe smoking cessation treatment in pregnant women?”

Search Strategy (Keywords)

!!! Different authors use different words for the same topic !!!

Search could end with

- ***Too few results*** → Broad Your Search by adding alternative terms to describe
- ***Too many results*** → Narrow Your Search by adding more specific search terms
- ***Irrelevant results*** → Check Your Key Words

Formulating Search Terms

P <u>P</u>atient / <u>P</u>opulation	P <u>P</u>roblem	I <u>I</u>ntervention	O <u>O</u>utcome
Pregnant	Smoking	Nicotine replacement	Cessation
Pregnancy	Smoker	Nicotine patch	Stop
Maternal		Nicotine gum	Quit

Developing a search strategy

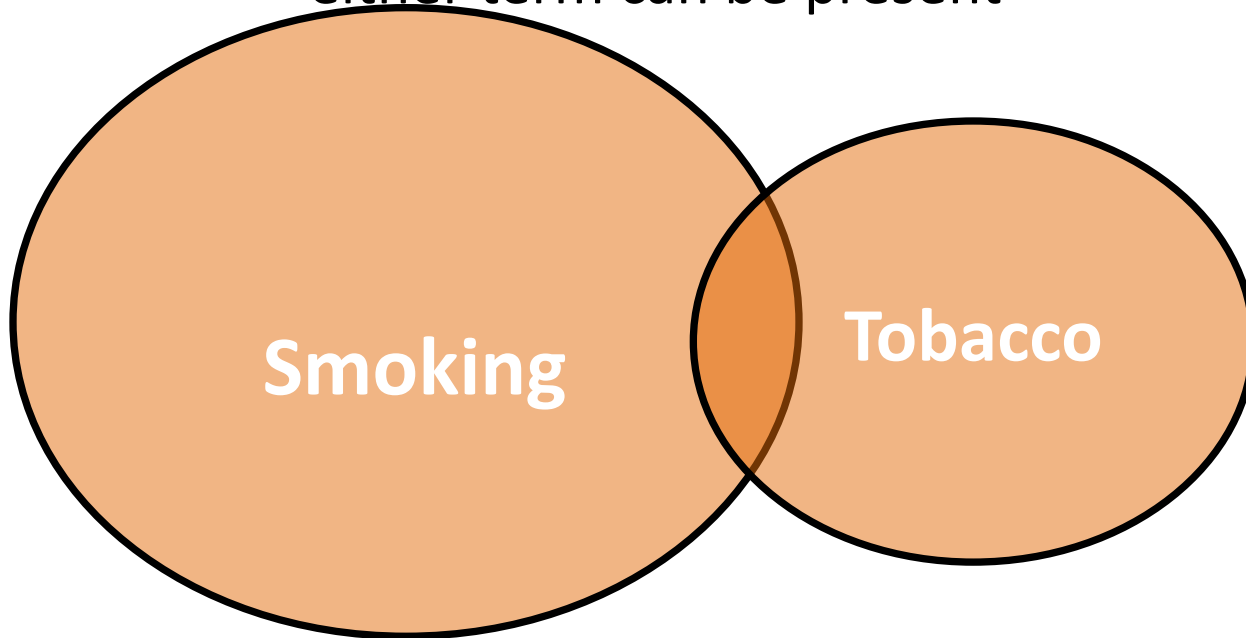
For our example topic's question;

1. pregnan*
2. smoking or smoker
3. nicotine replacement OR nicotine patch
4. cessation OR stop OR quit
5. 1 AND 2 AND 3 AND 4

**For a Broad Search:
Combine terms with
“OR”**

Smoking **OR** tobacco

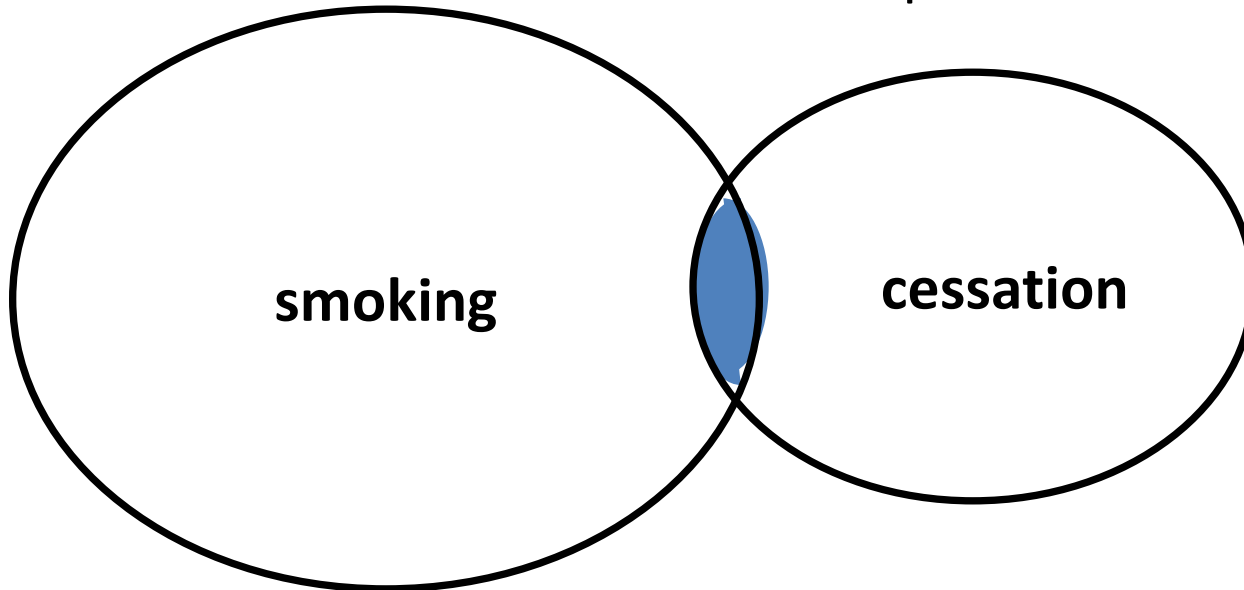
either term can be present



**For a Narrowed Search:
Combine terms with
“AND”**

Smoking **AND** cessation

both terms must be present



Quick tips

- Take a common word stem and look for **spelling variations e.g.**
 - **smok*** : searching will end with the results of the words starting with **smok**
smoking, smoker, smokers... but also smoked salmon
- **Phrase searching**
 - Use double quote marks if you want words to appear next to each other e.g.
“smoking cessation”

Example Search for smok* in PubMed

10 years
Custom range...

Species
Humans
Other Animals

[Clear all](#)

[Show additional filters](#)

Wong M, Saari M, Patterson E, Puts M, Tourangeau AE.
Health Soc Care Community. 2017 Feb 19. doi: 10.1111/hsc.12430. [Epub ahead of print]
PMID: 28215055

[Racial disparities in preventable risk factors for head and neck cancer.](#)

2. Dwojak S, Bhattacharyya N.
Laryngoscope. 2017 Feb 19. doi: 10.1002/lary.26203. [Epub ahead of print]
PMID: 28215050

[Factors affecting the variability in the observed levels of cadmium in blood and urine among former and current **smokers** aged 20-64 and ≥ 65years.](#)

Jain RB.
Environ Sci Pollut Res Int. 2017 Feb 18. doi: 10.1007/s11356-017-8607-3. [Epub ahead of print]
PMID: 28214937

[Metabolic syndrome and cardiovascular risk among institutionalized patients with schizophrenia receiving long term tertiary care.](#)

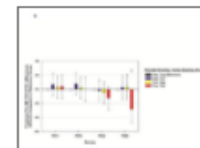
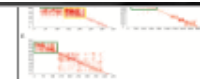
4. Seow LS, Chong SA, Wang P, Shafie S, Ong HL, Subramaniam M.
Compr Psychiatry. 2017 Feb 2;74:196-203. doi: 10.1016/j.comppsy.2017.01.017. [Epub ahead of print]
PMID: 28214752

[Identifying "social **smoking**" in young adults using an empirically-driven approach.](#)

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