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How Accurate Are Wikipedia Articles in Health, Nutrition, and Medicine?

Les articles de Wikipédia dans les domaines de la santé, de la nutrition et de la médecine sont-ils exacts ?

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Abstract: Previous studies of Wikipedia have reported mixed results regarding the quality of information on health-related topics. We investigated the accuracy of Wikipedia entries in the areas of health, nutrition, medicine, and complementary and alternative medicine. We formulated 32 statements which are often stated but are probably incorrect ("common misconceptions"). Using Google we found 49 Wikipedia entries that provided information on these 32 statements. Most entries are accurate, but deficiencies are present in a minority. The information provided by Wikipedia has a high degree of accuracy for 23 (72%) of the 32 common misconceptions (19 had a score of 5, the highest mark possible, and 4 had a score of 4.5–4.7). Seven of them (22%) had a score of 4–4.1, indicating that the entry has a minor error or that significant information is missing. Two had a low score (3.5), which indicates a more serious problem. Of all the 49 Wikipedia entries that were evaluated, four had a score of only 3, indicating that the accuracy is seriously flawed or that no information is given. These findings together with those from other studies indicate that the information provided by Wikipedia is mostly of high quality but that significant errors and omissions are fairly common.

Keywords: health information, medical information, nutrition information, Wikipedia

Résumé : Des études antérieures portant sur les articles Wikipédia ont fait mention de résultats inégaux concernant la qualité de l'information sur les sujets liés à la santé. Nous avons étudié l'exactitude des entrées de Wikipédia dans les domaines de la santé, de la nutrition, de la médecine et des médecines parallèles et complémentaires. Nous avons défini trente-deux énoncés qui sont souvent proposés, mais qui sont probablement incorrects (conceptions courantes mais fausses). Une recherche Google a trouvé quarante-trois entrées Wikipédia fournissant des informations sur

ces trente-deux énoncés. La plupart des entrées fournissaient des informations exactes, mais nous avons constaté des lacunes dans une minorité d'entre elles. Pour les trente-deux conceptions courantes mais fausses, vingt-trois (72 %) des entrées Wikipédia atteignaient un degré élevé d'exactitude (dix-neuf avaient un score de 5 [note la plus élevée] et quatre atteignaient 4,5–4,7). Sept des entrées (22%) atteignaient un score de 4–4,1, ce qui indique que l'entrée comportait une petite erreur ou que des informations essentielles étaient manquantes. Deux entrées atteignaient un score faible (3,5). Sur les quarante-trois entrées de Wikipédia qui ont été évalués quatre atteignaient un score de seulement 3, ce qui indique que l'entrée était soit gravement inexacte soit lacunaire. Ces résultats ainsi que ceux d'autres études indiquent que les informations fournies par Wikipédia sont généralement de haute qualité, mais que des erreurs et des omissions importantes sont assez fréquentes.

Mots-clés : information sur la santé; information médicale; information sur la nutrition; Wikipédia

Introduction

Wikipedia is an encyclopedia of knowledge that is accessed via the Internet. According to its website it offers over four million entries in English as well as millions more in other languages (Wikipedia 2013). These entries cover a very wide range of subjects and are easily accessible at no cost. Wikipedia is now the sixth most used website on the Internet (Alexa 2013). As a result, a Wikipedia entry routinely appears when an Internet search is carried out on almost any topic. This extends to information in most areas of health. A large survey reported that more than 70% of searches for health-related information produce a Wikipedia entry among the first 10 results (Laurent and Vickers 2009).

Evidence suggests that many health professionals use Wikipedia as a source of information. For example, one study reported that 28% of pharmacists in the United States use Wikipedia entries when searching for information on drugs (Brokowski and Sheehan 2009). There is little doubt that millions of members of the general public use Wikipedia as a source of information on diverse topics related to health. However, the accuracy of Wikipedia articles in the biomedical sciences is uncertain, and as a result Wikipedia is seldom cited in papers in peer-reviewed journals.

Several studies have evaluated whether Wikipedia deserves this second-rate status. Some studies have indeed found problems with the overall quality, especially the accuracy and completeness, of Wikipedia entries. One study assessed entries on three health problems—otitis media, conjunctivitis, and multiple sclerosis (Pender et al. 2009). The entries omitted some key information, and there were factual errors. Another study looked at entries on the subject of statins (drugs that lower blood cholesterol; Kupferberg and Protus 2011). While none of the information was incorrect, much of it was incomplete in ways that could harm patients (a lack of information on drug interactions and on contraindications for the drugs). A much broader study on the quality of information on

drugs determined that Wikipedia entries were inferior to those at Medscape Drug Reference (Clauson et al. 2008). The investigators concluded that Wikipedia is not authoritative in this area. Similarly, an assessment of the information in Wikipedia on 20 common drugs revealed that it was often incomplete or inaccurate (Lavsa et al. 2011). The investigators concluded that pharmacy students should not use Wikipedia.

In contrast to the above studies, others have rated Wikipedia more positively. One study reported that Wikipedia entries on the topic of osteosarcoma were generally of good quality but inferior to those on the website of the National Cancer Institute (Leithner et al. 2010). Another study found that for schizophrenia and depression the quality of information provided by Wikipedia compared favourably with that found in a psychiatric textbook (Reavley et al. 2012). A study evaluated content related to 10 types of cancer (Rajagopalan et al. 2011). In comparison with information provided by the National Cancer Institute's Physician Data Query, that from Wikipedia was of similar accuracy and depth though it was less readable. One study observed that Wikipedia entries on a wide variety of health-related topics were based on reputable sources of information (Haigh 2011).

The study reported here was carried out to explore this subject further. Our specific aim was to determine the degree of accuracy of articles in Wikipedia in the areas of health, nutrition, medicine, and complementary and alternative medicine.

Methods

Formulation of Test Statements

We formulated 32 statements, each of which is often stated but is unlikely to be correct ("common misconceptions") (presented in the appendix). Most of the common misconceptions fell into one of these groups: (1) the statement was in older published literature that has been disproven by more recent findings; or (2) the statement is based on little more than speculation with only weak supporting evidence (often by persons selling supplements or promoting unproven ways to prevent or treat various health conditions). In most cases we have seen the common misconceptions stated numerous times. The table provides examples of where the common misconceptions have been stated. We also formulated a correct version of each statement that is based on strong supporting evidence. We included only statements where it would be feasible to categorize Wikipedia entries as being accurate or incorrect (or somewhere in between).

The rationale for this study design is as follows. If Wikipedia is an unreliable source of information, then we would predict that several of the above common misconceptions would be found in Wikipedia entries and presented as if they were proven facts. Conversely, if Wikipedia is a reliable source of information, then we would predict that only the accurate version of each statement would be found in Wikipedia entries.

The 32 statements came from the following areas:
- herbal supplements (3 statements);
- non-herbal supplements (2);
- nutrition and health (11);
- cancer (3);
- cardiovascular disease (3);
- complementary and alternative medicine (7); and
- health (general aspects) (3).

Several statements overlapped between two or more areas.

Searches and Grading of Wikipedia Entries

We carried out Google searches for Wikipedia entries that covered information related to the 32 statements. This was done during November 2013. We searched for keywords or terms that might be used by a health-care professional, a scientist, or a layperson. For example, for the statement "Tea and coffee have a diuretic action which may therefore lead to dehydration," we searched for the terms "tea," "coffee," and "diuretic action." Similarly, for the statement "Red wine is more effective than other types of alcoholic beverage for preventing heart disease," we searched for the terms "red wine," "wine," "alcohol," and "heart disease." In several cases there was more than one entry with relevant information, in which case all entries were graded and an overall assessment made. However, in other cases Wikipedia had one main entry on a topic but also had other entries which contained only a brief mention of the topic in question and/or were cross-referenced to the entry that covered the topic in more detail. In such cases only the main entry was assessed. Each of the Wikipedia entries is a separate Web page.

Wikipedia entries were graded by level of accuracy as follows: 1 = major error, 2 = significant error, 3 = neutral (or no information given), 4 = mostly correct (but has a minor error or significant information is missing), or 5 = very accurate (including the inclusion of all important information).

For several of the common misconceptions the "accurate statement" contains a degree of uncertainty. For example, for the common misconception on calcium supplements, the accurate statement is "Evidence indicates that calcium supplements may cause an increased risk of cardiovascular disease." The supporting evidence for this is strongly suggestive but falls well short of being firmly established. Accordingly, a score of 5 would indicate that the Wikipedia entry accurately states our present knowledge, including the level of uncertainty.

Results

The findings are shown in detail in the appendix and are summarized in table 1. We evaluated the accuracy of 49 Wikipedia entries that provide information on the 32 common misconceptions. The distribution of the mean scores for the 32 sets of evaluations was as follows: nineteen had a score of 5 (highest mark), four scored 4.5–4.7, seven scored 4–4.1, two scored 3.5, and none scored below 3.5. As indicated in the appendix, 4 Wikipedia entries (out of 49) had a score of

Table 1: Comparison of Wikipedia with Current Evidence: Summary

	Common misconception*	Wikipedia score†
	Herbal supplements	
1	Ginkgo improves memory, treats and prevents dementia	5
2	Echinacea treats and prevents colds and flu	3.5
3	Ginseng gives increased stamina, improves mental and physical performance	4
	Non-herbal supplements	
4	Glucosamine and chondroitin help treat osteoarthritis	4.5
5	Calcium supplements are safe	4.5
	Nutrition and health	
6	Tea and coffee have a diuretic action and may cause dehydration	5
7	Drink at least seven glasses of water a day	5
8	Organic foods are better for health as they have no pesticides	4
9	Sugar can make children hyperactive	4.1
10	Supplements of vitamin D improve bone mineral density	4
11	High doses of vitamin C prevent the common cold	5
12	Beta-carotene improves health, prevents disease	3.5
13	Hoodia suppresses the appetite, aids with weight loss	5
14	Genetically modified organisms may harm health	5
15	Bottled water is safer than tap water	5
16	Blood type is related to risk of disease, indicates a person's optimal diet	5
	Cancer	
17	Dietary fibre prevents colon cancer	4
18	Women aged 40–49 should be screened for breast cancer with regular mammograms	5
19	Screening for prostate cancer is of value	5
	Cardiovascular disease	
20	Folic acid and vitamins B_6 and B_{12} lower blood homocysteine, prevent heart disease	4
21	Olive oil lowers the blood cholesterol level, prevents heart disease	4.7
22	Red wine is more effective than other alcoholic beverages for preventing heart disease	4
	Complementary and Alternative Medicine	
23	Acupuncture helps treat addiction disorders	5
24	Iridology helps diagnose disease	5
25	Chelation therapy helps treat cardiovascular disease	5
26	Various treatments (especially herbal products) accelerate detoxification; this improves health	5
27	Reflexology is an effective treatment of various medical conditions	4.5
28	Reiki aids in stress reduction, improves health, and is a useful treatment of various medical conditions	5
29	Homeopathy is an effective treatment of various medical conditions	5
	Health (general aspects)	
30	MMR vaccine causes autism in children	5
31	Stomach ulcers are caused by stress	5
32	Whitening teeth artificially is safe	5

*These are abbreviated. See appendix for full details.
†Each Wikipedia score is based on one Wikipedia entry, except for statements 4, 9, 10, 11, 12, 17, 18, 20, 21, 22, and 23.

only 3 (indicating that the accuracy is neutral [i.e., neither correct nor incorrect] or that no information is given; common misconceptions 9, 10, 12, and 20). However, other Wikipedia entries on the same four common misconceptions scored higher marks.

Discussion

The findings reported here should be viewed cautiously. First, we assessed Wikipedia only for a limited number of areas related to health, nutrition, medicine, and complementary and alternative medicine. An assessment of the accuracy of Wikipedia entries on other topics within those areas might produce different findings. It must also be stressed that categorizing the accuracy of statements is not always clear-cut; some misclassification may therefore have occurred.

Our findings reveal that most Wikipedia entries have a high level of accuracy but that deficiencies are present in a significant minority. This is best shown by the distribution of scores. Of the 32 common misconceptions for which we evaluated the accuracy of Wikipedia entries, 19 (out of 32 mean scores) have a score of 5 (highest mark), and 4 scored 4.5–4.7. Thus, 23 out of 32 (72%) were judged to have a high degree of accuracy. Seven of the 32 mean scores (22%) have a lesser degree of accuracy (i.e., a score of 4–4.1, indicating that the entries are mostly correct but that minor errors are present or significant information is missing). More serious problems were seen with two sets of entries (mean scores of 3.5). Of the 49 Wikipedia entries that were evaluated, 4 had a score of only 3 (indicating that the accuracy is seriously flawed or that no information is given). To put this in context we should bear in mind that review and commentary papers in peer-reviewed journals are often met with strong disagreement.

Previous studies of Wikipedia entries have given mixed results regarding the quality of information on health-related topics. Some have been positive in their assessment (Leithner et al. 2010; Reavley et al. 2012; Rajagopalan et al. 2011; Haigh 2011), whereas others have pointed to significant errors or other deficiencies in the information (Pender et al. 2009; Kupferberg and Protus 2011; Clauson et al. 2008; Lavsa et al. 2011). These inconsistent findings suggest that Wikipedia is a "work in progress"; while it is mostly quite accurate it should not be relied on as an authoritative source of information. The accuracy of Wikipedia entries clearly requires further study across a range of subject areas. This research needs to be ongoing as Wikipedia entries are continually changing.

Conclusions

Looking at the information as a whole, including the study described here, a reasonable overall assessment is that much of the information provided by Wikipedia is of high quality but that significant errors and omissions are fairly common. Wikipedia should therefore not be relied on as a primary source of scholarly work. However, it can be a useful resource as a starting point for searches or as a supplement to other sources.

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Appendix. Comparison of Wikipedia with Current Evidence

		Herbal Supplements
1.	Common misconception	Ginkgo biloba improves the memory and may be helpful in the treatment or prevention of dementia.
	Examples	Advertising supplement in newspaper
		http://www.canadianvitaminshop.com/Catalog
	Accurate statement	There is little solid evidence supporting this. Most findings have failed to show a positive link between Gingko biloba and memory or the prevention of dementia (Snitz et al. 2009).
	Wikipedia entry	"Ginkgo biloba." http://en.wikipedia.org/wiki/Ginkgo_biloba
	Score	5
2.	Common misconception	Echinacea is of significant value for the treatment or prevention of either colds or flu.
	Example	http://www.avogel.ca
	Accurate statement	There is a lack of conclusive evidence that echinacea is of significant value for the treatment or prevention of either colds or flu. Findings from clinical studies have been inconsistent (Shah et al. 2007; National Center for Complementary and Alternative Medicine (NCCAM) 2012a; MedlinePlus 2013b).
	Wikipedia entry	"Echinacea." http://en.wikipedia.org/wiki/Echinacea
	Score	3.5
3.	Common misconception	Ginseng gives a sense of well-being and increased stamina and improves mental and physical performance.
	Example	http://www.canadianvitaminshop.com
	Accurate statement	There is a lack of solid evidence supporting this (NCCAM 2012a; Vogler, Pittler, and Ernst 1999).
	Wikipedia entry	"Ginseng." http://en.wikipedia.org/wiki/Ginseng
	Score	4
		Non-herbal Supplements
4.	Common misconception	Taking supplements of glucosamine or chondroitin (either separately or in combination) is of significant value for the treatment of osteoarthritis.
	Examples	Advertising supplement in newspaper
		http://www.canadianvitaminshop.com
	Accurate statement	These substances do not provide clinically useful improvement (Wandel et al. 2010).
	Wikipedia entries	"Glucosamine." http://en.wikipedia.org/wiki/Glucosamine
		"Chondroitin sulphate." http://en.wikipedia.org/wiki/Chondroitin_sulfate
	Score	5 (Glucosamine); 4 (Chondroitin); mean = 4.5
5.	Common misconception	Calcium supplements are completely safe.
	Example	http://www.nutracalcium.com
	Accurate statement	Evidence indicates that calcium supplements may cause an increased risk of cardiovascular disease (Bolland et al. 2011; Xiao et al. 2013).
	Wikipedia entry	"Calcium." http://en.wikipedia.org/wiki/Calcium
	Score	4.5
		General Nutrition
6.	Common misconception	Tea and coffee have a diuretic action which may therefore lead to dehydration.
	Example	http://www.buzzle.com/articles/diuretic-tea.html
	Accurate statement	Regular use of tea and coffee does not cause a diuretic action (Maughan and Griffin 2003).
	Wikipedia entry	"Caffeine." http://en.wikipedia.org/wiki/Caffeine
	Score	5

Appendix. (*continued*)

7.	Common misconception	People should drink at least seven glasses of water a day for health.
	Example	http://www.organicnutrition.co.uk/water.htm
	Accurate statement	The large majority of people can obtain all the water they need from food and regular drinks (Mayo Clinic 2011).
	Wikipedia entry	"Water." http://en.wikipedia.org/wiki/Water
	Score	5
8.	Common misconception	Compared with conventionally grown foods, organic foods are better for the health as they do not contain pesticides.
	Example	http://www.beyondpesticides.org/organicfood/health
	Accurate statement	Organic foods may contain less pesticide residue, but the difference is very small and unlikely to have any effect on health (Smith-Spangler et al. 2012).
	Wikipedia entry	"Organic food." http://en.wikipedia.org/wiki/Organic_food
	Score	4
9.	Common misconception	Sugar can sometimes make children hyperactive.
	Example	http://nancyappleton.com/141-reasons-sugar-ruins-your-health
	Accurate statement	There is only weak supporting evidence for this (Kanarek 1994).
	Wikipedia entries	"Hyperactivity." http://en.wikipedia.org/wiki/Hyperactivity
		"Sucrose." http://en.wikipedia.org/wiki/Sucrose
		"Sugar." http://en.wikipedia.org/wiki/Sugar
		"Diet and attention deficit hyperactivity disorder." http://en.wikipedia.org/wiki/Diet_and_attention_deficit_hyperactivity_disorder
	Score	4 (Hyperactivity); 3 (Sucrose); 4.5 (Sugar); 5 (Diet and ADHD); mean = 4.1
10.	Common misconception	Supplements of vitamin D are of value, especially for middle-aged and older women, to improve bone mineral density.
	Examples	http://www.nutritionexpress.com/vitamins+minerals/vitamin+d3
		http://www.nlm.nih.gov/medlineplus/druginfo/natural/929.html
	Accurate statement	Clinical studies provide little support for this view (Reid, Bolland, and Grey 2014).
	Wikipedia entries	"Osteoporosis." http://en.wikipedia.org/wiki/Osteoporosis
		"Vitamin D." http://en.wikipedia.org/wiki/Vitamin_D
	Score	3 (Osteoporosis); 5 (Vitamin D); mean = 4
11.	Common misconception	Supplements containing high doses of vitamin C help prevent the common cold.
	Examples	http://orthomolecular.org/resources/omns/v02n01.shtml
		http://defendingthetruth.com/healthcare/23746-vitamin-c-prevents-treats-common-cold.html
	Accurate statement	There is much evidence that disproves this view (MedlinePlus 2013d).
	Wikipedia entries	"Common cold." http://en.wikipedia.org/wiki/Common_cold
		"Vitamin C." http://en.wikipedia.org/wiki/Vitamin_C
		"Vitamin C and the common cold." http://en.wikipedia.org/wiki/Vitamin_C_and_the_common_cold
		"Vitamin C megadosage." http://en.wikipedia.org/wiki/Vitamin_C_megadosage
	Score	5 (all 4 entries)
12.	Common misconception	Supplements of beta-carotene help improve health or prevent disease.
	Examples	http://mokuaben08.hubpages.com/hub/Anti-aging-Wonders-and-other-Health-Benefits-of-Beta-Carotene-Everyone-Should-Know
		http://www.truestarhealth.com/Notes/2804006.html
		http://healing.answers.com/physical-health/the-healing-powers-of-beta-carotene-supplements

Appendix. (*continued*)

	Accurate statement	Clinical trials have failed to show benefits from supplements of beta-carotene, such as reduced risk of cancer or heart disease (MedlinePlus 2013a).
	Wikipedia entries	"*beta*-carotene.: http://en.wikipedia.org/wiki/Beta-Carotene "Carotene." http://en.wikipedia.org/wiki/Carotene
	Score	3 (*beta*-carotene); 4 (Carotene); mean = 3.5
13.	Common misconception	Supplements of hoodia suppress the appetite and help achieve weight loss.
	Examples	http://answers.yahoo.com/question/index?qid=20060930155402AATBlbz http://www.herbalhealer.com/hoodia.html http://www.wvruralhealthpolicy.org/hoodia-faq
	Accurate statement	There is very little supporting evidence for this claim (NCCAM 2012b).
	Wikipedia entry	"Hoodia gordonii." http://en.wikipedia.org/wiki/Hoodia_gordonii
	Score	5
14.	Common misconception	Food containing genetically modified organisms (GMOs) may pose a risk to health.
	Examples	http://www.charismamag.com/life/health/18898-are-genetically-modified-foods-harmful-or-helpful http://www.globalresearch.ca/potential-health-hazards-of-genetically-engineered-foods/8148 http://www.wanttoknow.info/health/genetically_modified_foods_gm_harmful
	Accurate statement	There is no credible supporting evidence for this view (Friedman 2013).
	Wikipedia entry	"Genetically modified food controversies." http://en.wikipedia.org/wiki/Genetically_modified_food_controversies
	Score	5
15.	Common misconception	Bottled water is safer than tap water.
	Examples	http://www.canadianliving.com/health/nutrition/the_healthiest_water_to_drink.php http://www.naturalhydrationcouncil.org.uk/about-us/faqs-on-bottled-water
	Accurate statement	Tap water is perfectly safe and may be safer than bottled water (Health Canada 2010).
	Wikipedia entry	"Bottled water." http://en.wikipedia.org/wiki/Bottled_water
	Score	5
16.	Common misconception	A person's blood type is related to their risk for several diseases. A person's optimal diet depends on their blood type.
	Examples	http://www.aqua4balance.com/Healthy-Diet/blood-type-nutrition-educational-workshop.html#.UpzWNBBX_bo http://healthysolutions101.com/services/blood-type http://www.netfit.co.uk/dieting/advice/blood-group-diet.htm
	Accurate statement	There is no credible supporting evidence for this view (Cusack et al. 2013).
	Wikipedia entry	"Blood type diet." http://en.wikipedia.org/wiki/Blood_type_diet
	Score	5

Cancer

17.	Common misconception	Adding extra dietary fibre to the diet reduces the risk of colon cancer.
	Examples	http://newhope360.com/supply-news-amp-analysis/dietary-fiber-does-help-prevent-colon-cancer-says-harvard-mens-health-watch http://www.thebetterhealthstore.com/News/Fiber062801.html

Appendix. (*continued*)

	Accurate statement	People who habitually consume a diet with a high fibre content have a reduced risk of colon cancer. However, a cause-and-effect relationship has not been firmly established.
	Wikipedia entries	"Dietary fiber." http://en.wikipedia.org/wiki/Dietary_fiber "Fibre supplements." http://en.wikipedia.org/wiki/Fibre_supplements
	Score	4 (both entries)
18.	Common misconception	Women aged 40–49 should be screened for breast cancer by use of regular mammograms.
	Example	http://www.cancer.org/cancer/breastcancer/detailedguide/breast-cancer-detection
	Accurate statement	The overall benefit of breast cancer screening in women aged 40–49 is highly controversial. Many experts argue that women in this age group should not be screened as the harm (because of false positives and resulting unnecessary treatment) is greater than the benefit (reduced risk of death from breast cancer; Canadian Task Force on Preventive Health Care et al. 2011).
	Wikipedia entries	"Breast cancer screening." http://en.wikipedia.org/wiki/Breast_cancer_screening "Mammography." http://en.wikipedia.org/wiki/Mammography
	Score	5 (both entries)
19.	Common misconception	Screening for prostate cancer can often detect the disease at an early stage when treatment is more likely to be successful.
	Example	http://www.menstuff.org/issues/byissue/healthprostate.html
	Accurate statement	Screening for prostate cancer has very little effect on the risk of death (Djulbegovic et al. 2010).
	Wikipedia entry	"Prostate cancer screening." http://en.wikipedia.org/wiki/Prostate_cancer_screening
	Score	5

<div align="center">Cardiovascular Disease</div>

20.	Common misconception	Supplements of folic acid and vitamins B_6 and B_{12} lower the blood level of homocysteine and therefore help prevent heart disease.
	Example	Cook, S. and O.M. Hess. 2005. "Homocysteine and B Vitamins." *Handbook of Experimental Pharmacology* 170: 325–38.
	Accurate statement	Supplements of these B vitamins can lower the blood level of homocysteine. However, this does not lead to a reduced risk of heart disease (Martí-Carvajal et al. 2013).
	Wikipedia entries	"Homocysteine." http://en.wikipedia.org/wiki/Homocysteine "Folic acid." http://en.wikipedia.org/wiki/Folic_acid "Vitamin B_6." http://en.wikipedia.org/wiki/Vitamin_B6
	Score	4 (Homocysteine); 5 (Folic acid); 3 (Vitamin B_6); mean = 4
21.	Common misconception	Adding olive oil to the diet lowers the blood cholesterol level and helps prevent heart disease.
	Examples	http://www.health.com/health/gallery/0,,20307113_4,00.html http://www.filippoberio.com/yourhealth http://www.oliveoiltimes.com/olive-oil-health-benefits
	Accurate statement	Olive oil lowers the blood cholesterol level only if it replaces saturated fat. It does not lower the blood cholesterol level if it replaces polyunsaturated fat or carbohydrates. There is no direct clinical trial evidence demonstrating that olive oil prevents heart disease (Flock and Kris-Etherton 2012).

Appendix. (*continued*)

	Wikipedia entries	"Olive oil." http://en.wikipedia.org/wiki/Olive_oil
		"Mediterranean diet." http://en.wikipedia.org/wiki/Mediterranean_diet
		"Monounsaturated fat." http://en.wikipedia.org/wiki/Monounsaturated_fat
	Score	5 (Olive oil); 5 (Mediterranean diet); 4 (Monounsaturated fat); mean = 4.7
22.	Common misconception	Red wine is more effective than other types of alcoholic beverages for preventing heart disease.
	Examples	http://www.ynhh.org/about-us/red_wine.aspx
		http://www.advisor.com/story/how-red-wine-apples-help-prevent-cancer-heart-disease
	Accurate statement	All types of alcoholic beverage are protective against heart disease. There is little evidence that red wine is more protective than other alcoholic beverages (Mukamal et al. 2005; Rimm et al. 1996).
	Wikipedia entries	"Alcohol and cardiovascular disease." http://en.wikipedia.org/wiki/Alcohol_and_cardiovascular_disease
		"Health effects of wine." http://en.wikipedia.org/wiki/Health_effects_of_wine
	Score	4.5 (Alcohol and cardiovascular disease); 3.5 (Health effects of wine); mean = 4

Complementary and Alternative Medicine

23.	Common misconception	Acupuncture is probably a useful treatment of addiction disorders, such as alcohol dependence and smoking.
	Examples	http://www.acupuncture.com/Conditions/addict.htm
		http://www.pacificcollege.edu/acupuncture-massage-news/articles/1034-acupuncture-for-nicotine-addiction.html
	Accurate statement	There is little solid evidence supporting this (Cho and Whang 2009; White et al. 2011).
	Wikipedia entries	"Cocaine dependence." http://en.wikipedia.org/wiki/Cocaine_dependence
		"Smoking cessation." http://en.wikipedia.org/wiki/Smoking_cessation
	Score	5 (both entries)
24.	Common misconception	Iridology is of value for helping to diagnose various diseases.
	Example	http://www.healingwithiridology.com
	Accurate statement	There is no evidence supporting this (Munstedt et al. 2005).
	Wikipedia entry	"Iridology." http://en.wikipedia.org/wiki/Iridology
	Score	5
25.	Common misconception	Chelation therapy is effective in the treatment of atherosclerotic cardiovascular disease.
	Example	http://www.naturopathyclinic.com/chelation.php
	Accurate statement	There is no evidence supporting this (Lamas and Hussein 2006).
	Wikipedia entry	"Chelation therapy." http://en.wikipedia.org/wiki/Chelation_therapy
	Score	5
26.	Common misconception	Various treatments (especially herbal products) can accelerate detoxification so that the body is cleansed and health improved.
	Examples	http://www.canadianvitaminshop.com
		Advertising supplement in newspaper
	Accurate statement	There is virtually no supporting evidence (Ernst and Singh 2009).
	Wikipedia entry	"Detoxification." http://en.wikipedia.org/wiki/Detoxification_(alternative_medicine)
	Score	5

Appendix. (*continued*)

27.	Common misconception	Reflexology is effective in the treatment of a variety of medical conditions.
	Examples	http://www.takingcharge.csh.umn.edu/explore-healing-practices/reflexology http://www.reflexologykelowna.ca http://mettamassage.com/reflexology
	Accurate statement	The majority of clinical trials failed to show a benefit from treatment with reflexology, but several trials did report positive findings (Ernst, Posadzki, and Lee 2011). The scientific rationale for reflexology is very weak. Based on the evidence as a whole reflexology should not be recommended.
	Wikipedia entry	"Reflexology." http://en.wikipedia.org/wiki/Reflexology
	Score	4.5
28.	Common misconception	Reiki is effective for stress reduction, improvement of health, and the treatment of a variety of medical conditions.
	Examples	http://www.reiki.ca/faqs.htm http://www.reiki.org/faq/whatisreiki.html http://www.innerfocus.ca
	Accurate statement	Some clinical trials reported positive findings (vanderVaart et al. 2009; So, Jiang, and Qin 2008). However, the scientific rationale for reiki is very weak. Based on the evidence as a whole the effectiveness of reiki is not proven, and it should not be recommended.
	Wikipedia entry	"Reiki." http://en.wikipedia.org/wiki/Reiki
	Score	5
29.	Common misconception	Homeopathy is an effective treatment for a variety of medical conditions.
	Examples	http://www.homeopathy-soh.org/about-homeopathy/what-is-homeopathy http://www.homeocentre.ca http://www.electrahealthfloor.com/homeopathy-downtown-vancouver/index.html
	Accurate statement	Some clinical trials reported positive findings (Fisher 2011). However, the scientific rationale for homeopathy is very weak. Based on the evidence as a whole the effectiveness of homeopathy is not proven, and it should not be recommended (Bewley et al. 2011).
	Wikipedia entry	"Homeopathy." http://en.wikipedia.org/wiki/Homeopathy
	Score	5

<div align="center">Health: General</div>

30.	Common misconception	MMR vaccine (which inoculates children against measles, mumps, and rubella/German measles) causes autism in children.
	Examples	http://www.naturalnews.com/041897_mmr_vaccines_autism_court_ruling.html http://www.trueactivist.com/courts-quietly-confirm-mmr-vaccine-causes-autism http://www.activistpost.com/2013/09/22-medical-studies-that-show-vaccines.html
	Accurate statement	There is no credible evidence supporting this (American Academy of Pediatrics 2013).
	Wikipedia entry	"MMR vaccine controversy." http://en.wikipedia.org/wiki/MMR_vaccine_controversy
	Score	5
31.	Common misconception	Stomach ulcers are caused by stress.

Appendix. (*continued*)

	Examples	http://voices.yahoo.com/stomach-ulcers-other-stress-related-ailments-are-168761.html
		http://www.wikihow.com/Recognize-the-Symptoms-of-Stomach-Ulcers
		http://dherbs.com/news/4824/4669/Ulcers/d,ai.html#.UpuXBhBX_bo
	Accurate statement	The major cause of stomach ulcers is an infection with a bacterium called *Helicobacter pylori* (*H. pylori*). Stress is not a major cause, although some evidence suggests that it may aggravate the problem (MedlinePlus 2013c).
	Wikipedia entry	"Peptic ulcer." http://en.wikipedia.org/wiki/Peptic_ulcer
	Score	5
32.	Common misconception	Whitening teeth artificially is safe.
	Examples	http://www.beautybarlaserclinic.com/teeth-whitening
		http://complexionsbykate.com/TeethWhitening.html
		http://www.skinstore.com/gosmile-tooth-whiteners.aspx
	Accurate statement	There is a lack of good clinical data and longitudinal studies to show the potential adverse effects of whitening teeth (Canadian Dental Association 2013; Scientific Commission on Consumer Products of the European Commission 2007).
	Wikipedia entry	"Tooth bleaching." http://en.wikipedia.org/wiki/Tooth_bleaching
	Score	5