NFP Supporting Science

NATURAL FERTILITY™
prescription
Optimize Your Fertility Naturally

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Introduction

Natural Fertility Prescription (NFP) is an evidence-based, pre-conceptual approach for improving fertility metrics, outcomes and success rates in both women and men.

NFP is typically of interest to two groups of couples. Those who are looking for an all-natural alternative to IVF as well as those who would like to combine NFP with IVF in an effort to increase their overall likelihood of a successful pregnancy and birth outcome.

Couples who first find out about the NFP approach sometimes ask about the supporting science behind this approach.

After all, when it comes to health, there is a lot of unsubstantiated information out there. So it's understandable that one or both partners may ask something like:

> *"What is the extent of the hard scientific evidence showing that fertility may be significantly improved by things like food and diet, nutritional supplementation, removal of toxins and avoidance of environmental pollutants, sleep hygiene, exercise and activity, mind-body therapies, stress and lifestyle choices?"*

In this document we have summarized and linked to a selection of some of the most relevant published scientific studies and reviews which support and underpin the NFP approach.

These studies (and others beyond the scope of this document) have informed the development of the NFP approach since 2008.

We have organized them into the below categories, summarized the key findings and linked to the source.

- **Preconception Diet**
- **Nutritional Supplementation**
- **Environmental Toxins**
- **Electromagnetic Frequency Exposure**
- **Exercise and Physical Activity**
- **Heavy Metal Exposure**
- **Mind-Body Therapies**
- **Alcohol, Coffee, Smoking and Recreational Drugs**
- **Sperm Health**
- **Weight/Lifestyle**

Over the past two decades, hundreds of research studies related to the topic of infertility and preconception care have been published in respected, peer-reviewed medical journals. We have included only a selection of the most compelling and easily digestible in this document.

Preconception Diet

Increasing intake of specific food groups and taking specific nutrients may improve chances of conceiving.

According to a study published in the journal of Fertility and Sterility, evidence suggests that diet may be a modifiable factor in female fertility. Increasing your intake of specific food groups and taking specific nutrients may improve your chances of conceiving naturally or via ART based fertility treatments.

Link to the study

Women with the right preconception diets are 65% more likely to have IVF success.

Adherence to a fertility preconception diet increases your chances of a successful IVF/ICSI treatment, according to a study published in the Journal of Human Reproduction. In the study, women with better preconception diets are 65% more likely to have successful fertility treatment outcomes.

Link to the study

Eating organic helps you get up to 69% more antioxidants and 48% less Cadmium in your food!

Organic foods have a higher antioxidant content than non-organically farmed crops. According to a study from The British Journal of Nutrition which reviewed 343 peer-reviewed journals, organic crops have substantially higher antioxidant (polyphenol) content, about 19% to 69% higher than the non-organic crops.

Additionally, organic foods contain 48% less Cadmium (a heavy metal linked with a host of negative health issues) and pesticide residues compared with conventional crops.

Link to the study

Increasing trans fat intake by 2% is associated with a 75% increased risk of ovulatory infertility.

A study involving 18,555 premenopausal women without a history of infertility discovered that each 2% increase in trans-unsaturated fatty acids led to a 73% greater risk of ovulatory infertility. Obtaining 2% of energy from trans unsaturated fats (ex. vegetable oils, chips, fast food, baked goods) instead of monounsaturated fats (ex. olive oil,avocado, almonds) is associated with more than doubled risk of ovulatory infertility in the research population.

Link to the study

More advanced glycation end products (AGEs) = poor ART outcomes.

A study published in the Journal of Human Reproduction evaluated the correlation between advanced glycation end products (AGEs), its markers pentosidine and carboxymethyl lysine (CML), and assisted reproductive technology (ART) outcomes. According to the study results, the presence of AGEs, pentosidine and led to fewer retrieved oocytes and fertilized eggs and embryos. Women with high AGEs and pentosidine in their follicular fluid had a lower likelihood of pregnancy, given the correlation of these substances with poor follicular and embryonic development.

Link to the study

Mediterranean diet improves IVF success rates.

Adhering to the Mediterranean diet improves success in women undergoing IVF treatment. In 244 women with BMI less than 30, women with stronger adherence to the Mediterranean diet had better IVF success rates than women who have little (or no) adherence to the diet. Women with high adherence to the Mediterranean diet have a 50% rate of clinical pregnancy and 48.8% live birth rate, but women with the lowest adherence to the diet only had 29.1% clinical pregnancy rate and 26.6% live birth rate. This study suggests that elements of the mediterranean diet may improve IVF success rates in women trying to conceive.

Link to the study

Nutritional Supplementation

Zinc deficiency is associated with neural tube defects in babies.

A study found that newborns with neural tube defects (Spina Bifida, encephalocele, and anencephaly) have significantly lower serum zinc levels compared to healthy controls. According to the researchers, the majority of neural tube defects in children may be preventable by folic and zinc supplementation by the mothers. In one related study, periconceptional (the period from before conception to early pregnancy) use of vitamins, minerals in food supplements by 859 mothers showed a protective effect by zinc for neural tube defects.

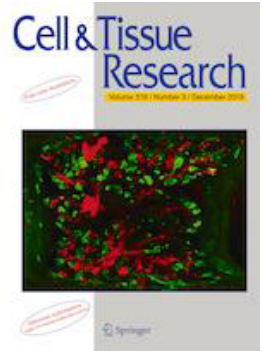
Link to the study

Vitamin D deficiency is linked to hypothyroid and autoimmune thyroid disorders.

Hypothyroid women tend to also be suffering from vitamin D deficiency, according to one study published in the International Journal of Health Sciences. A similar study determined that vitamin D deficiency is also present in the majority of women who have autoimmune thyroid disorders (AITDs) (72% of patients with AITDs versus 30.6% in the normal controls).

Link to the study

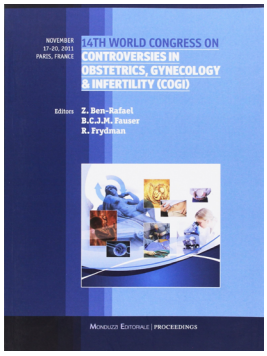
Vitamin A protects against BPA-induced sperm damage, animal study suggests.



Supplementing with Vitamin A helps inhibit Bisphenol A (BPA)-induced sperm malformations and poor sperm motility in mice. BPA is an estrogenic substance classified as an endocrine disruptor. In the study, mice administered with BPA but with vitamin A (retinol acetate) exhibited less sperm damage (27.8%) than mice administered with BPA alone (78.2% damage in sperm). The researchers concluded that vitamin A has a protective effect against estrogenic substances/endocrine disruptors such as BPA.

Link to the study

Melatonin in women with diminished ovarian reserve can help improve IVF outcomes.



Melatonin is a hormone produced by the pineal gland. Apart from regulating the sleep-wake cycle, melatonin is also a powerful antioxidant that may benefit your digestive system, eye health, and even your egg health. Previous studies have discovered the link between melatonin and egg quality and have therefore concluded that the natural decline in melatonin production from aging also contributes to poor egg quality in women.

A study published in the 14th World Congress on Controversies in Obstetrics, Gynecology & Infertility (COGI) discovered that in women with diminished ovarian reserve (DOR), melatonin (and myo-inositol) positively impacts their AMH levels, leading to better IVF outcomes.

Link to the study

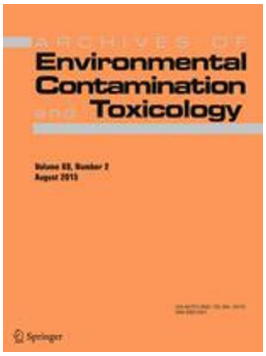
Antioxidants like Carnitines help improve reproductive disorders and improve egg quality in women.

According to one review published in the Reproductive Biology and Endocrinology journal, antioxidants like carnitines show great promise in improving outcomes in women struggling with infertility. Studies on the effect of Carnitines in females with fertility disorders indicate that these antioxidants are able to improve disorders including endometriosis, amenorrhea, and polycystic ovarian syndrome. These antioxidants also help improve sex hormone levels and also egg quality.

Link to the study

Environmental Toxins

Environmental pollutant causes failed fertilization in women undergoing IVF.



More than 50% of the women attending in one IVF program were discovered to have environmental pollutants (chemicals) in their serum and ovarian follicular fluid.

The most common chemical identified in these women is p.p'-DDE (Dichlorodiphenyldichloroethylene), a byproduct of the now-banned insecticide DDT. According to the study, DDE had the highest residue in the women and was associated with failed fertilization in these participants.

Link to the study

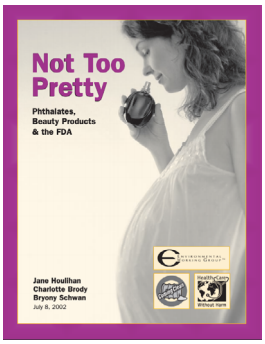
287 chemicals discovered in the umbilical cord blood of babies in the U.S..

A study led by the Environmental Working Group (EWG) found 287 chemicals present in newborn umbilical cord blood. The study tested the cord blood of randomly selected babies born in several U.S. hospitals. According to the research, these babies' blood contained consumer product ingredients, pesticides, and wastes from gasoline and coal, and even garbage. Theblood also tested positive for chemicals found in oil and stain repellents, fast food packaging, clothes, including PFOA (perfluorooctanoic acid) from Teflon, which is classified as a human carcinogen.

According to the study, of the 287 compounds detected in the cord blood, 217 are considered neurotoxic (toxic to the brain and nervous system), 208 are linked to abnormal development and birth defects in animals, and 180 are known carcinogens (can cause cancer).

Link to the study

75% of beauty products contain chemicals linked to birth defects and malformations.



Beauty products from common brand names tested positive for phthalates, a family of chemicals associated with permanent birth defects and malformations of the reproductive system. In the study, nearly 75% of the cosmetic/beauty products tested positive for phthalates, in concentrations ranging from trace amounts to almost 3% of the product formulation. Products from big names like Revlon, Calvin Klein, Christian Dior, Procter & Gamble, and more were some of the name-brands discovered with the hidden phthalates.

Women of childbearing age have the greatest exposure to these chemicals, in fact, nearly 20x greater than the other age and gender groups in the study. In addition, the highest exposures found in the same group exceeded the federal safety standard.

Link to the study

Exposure to environmental toxins linked to issues in sperm quality, motility, morphology and concentration.

According to a review published in the Current Urology Reports journal, exposure to environmental toxins linked to issues in sperm quality, motility, morphology, and concentration. Exposure to certain chemicals (reprotoxicants) causes various negative effects on sperm health and may lead to infertility.

Besides endocrine-disrupting chemicals (like BPA, phthalates, pesticides and herbicides, and heavy metals), factors such as air pollution, hyperthermia, and electromagnetic radiation from cell phones and laptops also contribute to infertility and the decline in overall sperm quality in men.

Link to the study

Electromagnetic Frequency Exposure (EMF)

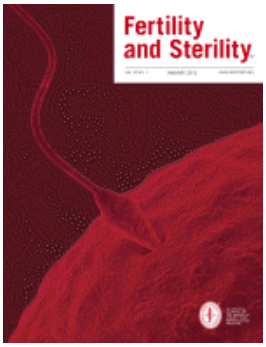
Regular cellphone use may increase risk of spontaneous abortion (miscarriage).

Women who spend more time on their mobile phones calling, using applications or even putting their cellphones in their pockets have a greater risk of spontaneous abortion (miscarriage) before 14 weeks. This is compared with women who do not spend as much time on their phones.

According to a study, using mobile phones increases women's exposure to electromagnetic field (EMF) radiation, which may potentially be the cause of spontaneous abortion in the study group. However, the researchers have yet to discover the mechanism behind EMF's effect on miscarriage.

Link to the study

Laptops and Wi-Fi increase DNA fragmentation and decrease sperm motility.



Laptop computers and Wi-Fi directly impacts sperm, according to a study published in the journal of Fertility and Sterility. In the study, normal sperm samples were exposed to a wireless internet-connected laptop for four hours. Results indicate greater sperm DNA fragmentation (damage) and a decrease in progressive sperm motility after the exposure. According to the researchers, using Wi-Fi connected laptops near the testes may damage the sperm.

Link to the study

Exercise and Physical Activity

Moderate exercise improves IVF outcomes and fertility but intense training reduces fertility.

Exercising can also improve IVF/ICSI/ART outcomes, according to a review published by The Fertility Society of Australia. According to the review, women who exercise for a minimum of one hour exercise three times per week improved their ICSI implantation rates and had a reduced risk for miscarriage. The same goes for women undergoing ART - low to moderate exercise in women undergoing ART also increased their implantation and live birth rates.

Exercise increases pregnancy rates in women by 35%, as opposed to diet, which only increases pregnancy rates by 10%. But while exercise is beneficial, having both a regular exercise regime and following a specific diet helps improve pregnancy and live birth outcomes, either by natural birth or via assisted reproduction.

In men, low levels of physical activity/exercise improves semen quality better than high levels of exercise (1-2 hours, 3-4 days/week). In addition, men who engage in high-intensity exercise/training show a decline in fertility and sperm parameters as opposed to men who engage in moderate exercise.

Link to the study

Physically active men have healthier sperm and hormone values.

Physically active men have better sperm parameters and hormone values than sedentary men. Despite having almost the same age, height and body type (weight), men who exercised regularly for one year had better sperm count, volume, motility and morphology than the sedentary participants. In addition, physically active men had better hormone profiles (follicle-stimulating hormone, luteinizing hormone, and testosterone).

According to the researchers, moderate physical activity and exercise (except cycling) may help keep sperm healthy and improve the hormone environment in men.

Link to the study

Women with PCOS or anovulatory infertility resume ovulation with exercise.

A review from the Sports Medicine journal states that vigorous exercise for 30 to 60 minutes a day is associated with a decreased risk of ovulatory infertility in women.

Moderate exercise also benefits women with polycystic ovarian syndrome (PCOS). According to the same review, women with PCOS or anovulatory infertility resume ovulation with exercise, with or without diet interventions. In obese or overweight women with or without PCOS, exercise lowered insulin and free androgen levels and restored hypothalamic-pituitary-adrenal (HPA) regulation of ovulation.

However, the effect is the opposite on extremely heavy exercisers who exercise more than 60 minutes a day. Heavy exercisers have a greater risk of anovulatory infertility.

Link to the study

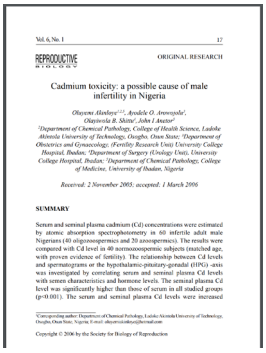
Heavy Metal Exposure

High levels of mercury lead to poor sperm parameters in men and ovarian dysfunction in women.

Heavy metals like mercury cause a long list of medical issues. These health dangers include reduced fertility, according to one study published in the Journal of Preventive Medicine & Public Health. In the review, dental assistants who were exposed to and men and women with increased mercury levels show reduced fertility. Men with increased mercury levels have poor sperm parameters, decreased testicular weight and even erectile dysfunction. Women with increased exposure to mercury, on the other hand, have ovarian dysfunction, hormonal imbalances, painful or irregular menstruation and other menstrual disorders, and premature menopause.

Link to the study

Cadmium toxicity may cause infertility in men.



Cadmium toxicity: a possible cause of male infertility in Nigeria

ORIGINAL RESEARCH

SUMMARY

Cadmium toxicity is considered the possible cause male infertility in Nigeria, based on the results of an article published in the Reproductive Biology journal. Men suffering from infertility (oligospermia and azoospermia) tested positive for high Cadmium (Cd) concentrations, unlike fertile men with normal sperm parameters. According to the researchers, Cd levels positively correlate with negative sperm characteristics and is also linked to infertility. This study determines the deleterious effect of Cadmium in spermatogenesis (sperm formation).

Link to the study

FDA cautions TTC women on eating fish with the highest levels of mercury.

FDA U.S. FOOD & DRUG ADMINISTRATION

The US FDA advises women who are trying to conceive as well as pregnant and breastfeeding mothers to refrain from eating king mackerel, shark, swordfish, bigeye tuna, marlin, orange roughy and tilefish from the Gulf of Mexico, due to their high mercury levels. The FDA advises women to limit their fish consumption to 2-3 4oz servings of fish from its 'best choices' list or 1 serving of fish from the 'good choices' list.

Link to the FDA's fish advice

Mind-Body Therapies

Mind-body program improves IVF success (50% vs. 20% in the control group).

In one study published in the Fertility and Sterility journal, subjects were randomized to either a ten-session mind-body program or no session (control group) before their IVF procedures. According to the results, IVF success (measured by clinical pregnancies) in women who have attended the mind-body program is 50% compared to the control group, which only had 20% clinical pregnancies.

Link to the study

Cognitive-behavioral therapy and support groups linked to better pregnancy rates.

In another study, women who were trying to conceive for 1-2 years without success were randomized to cognitive-behavioral group therapy, standard support group therapy or no therapy/group session at all. According to the results, 55% of the women who were enrolled in the cognitive-behavioral therapy group and 54% of the women in the support group conceived after 1 year of the sessions. In contrast, only 20% of the women in the control group conceived.

Link to the study

Higher body mass index (BMI) ≥25 may increase miscarriage risk.

One meta-analysis investigated the link between higher body mass index (BMI) and miscarriage and found out that women with higher BMI ≥25 have a higher risk of miscarriage. Overweight and obese women have miscarriage rates as high as 25 to 37%. Also, according to the study, obesity may increase the risk for miscarriage regardless of the method of conception (whether natural or using assisted reproduction).

Link to the study

Sleep Disturbances

Sleep disturbances in women negatively impacts reproductive health.

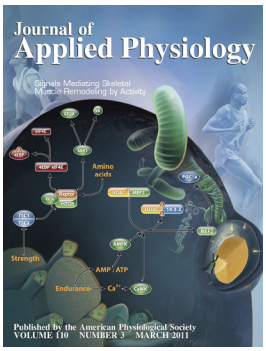
While researchers believe that there is still so much to learn about sleep and its relationship with fertility (female fertility in particular), preliminary studies indicate that sleep disturbances in women negatively impacts reproductive health. According to one review, circadian dysrhythmia may result in infertility.

Partial, acute sleep deprivation and sleep loss in healthy women is also associated with high thyroid-stimulating hormone (TSH). High TSH, as seen in hypothyroidism, can cause anovulation, amenorrhea, and recurrent miscarriage. Apart from TSH, the lack of sleep may also interfere with other reproductive hormones like follicle-stimulating hormone (FSH), estradiol, testosterone, prolactin and progesterone.

According to the review, 53% of night shift nurses reported changes in menstrual patterns and are considered at risk for infertility. Also sleep's effect on fertility may be connected with melatonin, a key circadian hormone that has anti-oxidative properties and may enhance fertility. Melatonin production peaks at night, during sleep, so sleep deprivation results in poor melatonin production.

Link to the study

Blue light from electronic devices suppresses melatonin secretion.



Light suppresses melatonin production at night, but short wavelength lights, like blue light emitted by commonly used electronic devices (television, mobile phones, tablets, laptops) suppresses melatonin production the most. According to one study, blue light suppresses melatonin secretion three times more than long wavelength light. Blue light melatonin suppression is greater than melatonin suppression by fluorescent light, which is used in most lighting fixtures.

Link to the study

Women who have trouble sleeping are 12% less likely to get pregnant than those without sleeping problems.

In an analysis of 6,873 women attempting to get pregnant, women with trouble sleeping more than 50% of the time were 12% less likely to conceive than women without trouble sleeping. Women with sleeping problems were 64% likely to conceive, compared to women without sleeping problems, who were 76% more likely to conceive. According to the study, the infertility risk is even greater in women with higher depressive symptoms and higher levels of perceived stress.

Link to the study

Alcohol, Coffee, Smoking and Recreational Drugs

One alcoholic drink per day decreases your chances of having a baby by up to 8 times and increases your chances of miscarriage by up to 38 times.

According to one study in females struggling with fertility, just one drink perday (for 1 year before the IVF procedure) is correlated to a 13% decrease in the number of eggs aspirated during the procedure. Women who drank alcohol in the study are 2.86 times less capable of getting pregnant. The participants who drank alcohol were 2.21 times more likely to miscarry than the ones who did not drink.

For the men, one additional drink per day decreased their chances of fathering children by 2.28 to 8.32 times. Female partners of males drinking beer are also 2.7 to 38.04 times more likely to miscarry when men drank alcohol ≤1 month before and during IVF treatment.

Link to the study

Drinking coffee doubles your miscarriage risk.

A study conducted by Kaiser Permanente Division of Research discovered that women who consumed more than 200 mg of caffeine per day (200 mg = at least 2 cups of coffee per day) were 2.23 times more likely to miscarry than women who did not drink coffee.

Women who consumed lower amounts of caffeine (less than 200 mg of caffeine per day) still had an increased miscarriage risk. Compared with women who did not drink coffee, women who consumed less than 200 mg of caffeine per day still increased their miscarriage risk by 1.42 times.

According to the study, the miscarriage is associated with caffeine itself and not the chemicals that are possibly in the coffee. This is because the same association with miscarriage was seen in caffeine-containing beverages like caffeinated soda and tea.

Link to the study

Smoking is associated with reduced fertility in men.

Tobacco smoke contains more than 4,000 chemicals and substances, including those that have a detrimental effect on various systems in the body. Cigarette smoke contains heavy metals including cadmium (Cd) and lead (Pb), which are both linked to reproductive toxicity and infertility in males. Another notorious chemical, Benzo(a)pyrene in tobacco smoke is classified as a mutagen and carcinogen. One of benzo(a)pyrene's negative effects in the body include sperm DNA damage. Cigarettes also contain nicotine, carbon monoxide, tar, radioactive substances, polycyclic aromatic hydrocarbons, and plenty others.

Smoking affects male smokers in a variety of ways. It affects reproductive hormone production and interferes with testosterone, follicle-stimulating hormone (FSH), luteinizing hormone (LH), and prolactin (PRL) production and balance in the body. As smoking affects hormone regulation, it impairs spermatogenesis (sperm creation), increases sperm DNA damage, and promotes apoptosis (cell death) in testicular cells.

Studies show that smoking clearly affects sperm parameters and causes lowered sperm count, motility, density, and increases sperm DNA damage and abnormally shaped sperm. Since sperm parameters positively correlates with infertility, smoking leads to reduced fertility in men.

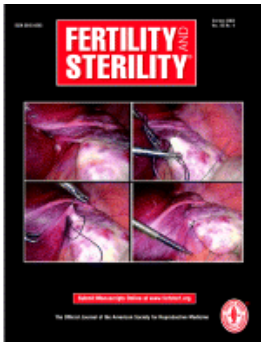
Link to the study

Smoking leads to lower ejaculate volume and lower seminal vesicles in infertile men.

Despite having higher testosterone levels, infertile men who are smokers have lower ejaculate volume and lower seminal vesicles, as confirmed by ultrasound. Studies have already confirmed that smoking correlates with poor sperm parameters in men, but studies are conflicting about its effect on testosterone. This study conducted in an infertility clinic in Italy was the first to investigate the impact of smoking on the physical attributes of the male genitalia using ultrasound.

Link to the study

13% of infertility cases are caused by smoking.



One review from the Fertility and Sterility journal outlined the impacts of smoking on fertility. According to the review, 13% of infertility is caused by smoking.

In women, smoking is associated with 1 to 4 years earlier menopause. According to the review, pregnancy delays of 6-12 months are 54% higher in smokers than in non-smokers. The pregnancy delay is the same regardless of smoking partner and the effect of passive smoking on conception delay is just slightly smaller.

Smoking also affects your chances of conceiving via assisted reproduction. Smokers require nearly twice the number of IVF cycles to conceive, compared to non-smokers. Each year that a woman smoked was associated with a 9% increase in the risk of unsuccessful ART cycles. Overall, it appears that ART may not necessarily be able to overcome the reduction in natural fecundity associated with smoking.

In men, smoking causes decreased sperm concentrations. Men who smoke have 22% decreased sperm concentration than non-smoking men. Also, male children of mothers who smoke 10 or more cigarettes per day had lower sperm densities than men with non-smoking mothers. These effects may be mediated by cadmium or other contaminants of cigarette smoke.

Link to the study

Women who smoke menopause earlier than non-smokers.

A study involving 50,678 women aged 40-98 in the United Kingdom explored the connection between the age at menopause and lifestyle factors (ex. BMI, exercise). On average, the women menopaused at 54.9 years. According to the study, earlier menopause is associated with smoking, Women who smoke menopaused 1 to 2 years earlier than the average and are 30% likely to menopause at a given age than non-smokers. Women who engage in regular exercise have shown later menopausal ages, as well as women who eat more meat (versus vegetarians in the study).

Link to the study

Mothers who smoke or use recreational drugs have lower birth weight babies and have poor pregnancy outcomes.

Mothers who use recreational drugs (cannabis or marijuana) have poorer pregnancy outcomes. According to one research study, cannabis use is associated with an increased risk of prematurity, reduced birth weight, and lower gestational age at delivery. Women who smoke, on the other hand, had lower birth weight babies.

Link to the study

Sperm Health

Some supplements may help improve sperm parameters.

According to one meta-analysis of 33 scientific papers, some supplements could potentially improve sperm parameters. In the study, selenium, zinc, omega-3 fatty acids increased total sperm concentration increased. Intake of omega-3 fatty acids and CoQ10 increased sperm count. Selenium, zinc, omega-3 fatty acids, CoQ10, and carnitines increased sperm motility. Carnitines increased progressive sperm motility, and selenium, omega-3 fatty acids, CoQ10 and carnitine supplements improved sperm morphology.

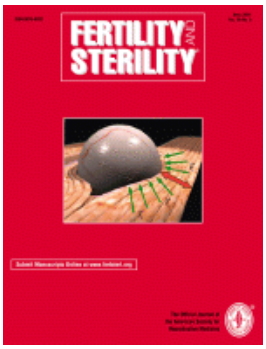
Link to the study

Sperm DNA damage is common among men with infertility and is linked to poor IVF outcomes.

In one study, men who are diagnosed with idiopathic and male factor infertility have greater sperm DNA damage (fragmentation) and oxidative stress compared with fertile men. While a clinical pregnancy was achieved in 27% of the study group using assisted reproductive techniques, men with the highest DNA damage and oxidative stress failed to have successful IVF outcomes. Sperm DNA damage positively correlates with oxidative stress. DNA damage and oxidative stress in sperm are linked to poor IVF outcomes.

Link to the study

Trans fats linked to lower sperm density.



IA study evaluated semen samples of men undergoing infertility assessment and found out that trans fatty acids (commonly found in fried foods, vegetable oils, processed foods, fast food, baked goods) were present in their sperm samples. According to the study, the higher the trans fatty acids in the sperm batch, the lower the sperm density. This pilot study confirmed the association between trans fatty acids and poor sperm density, as evidenced in animal studies.

Link to the study

Men who eat diets high in saturated fats have 43% lower sperm counts.

Men with the highest saturated fatty acid intake have 43% lower sperm count and 38% lower sperm concentration than men with the lowest fatty acid intake. On the other hand, men with the highest omega-3 fatty acids had 1.9% higher normal sperm morphology than the rest of the men.

Link to the study

Heat exposure can cause male infertility.


Occupational heat exposure and male fertility: a review.

P Thonneau, L Bujan, L Multigner, R Mieusset

Human Reproduction, Volume 13, Issue 8, Aug 1998, Pages 2122–2125, https://doi.org/10.1093/humrep/13.8.2122

Published: 01 August 1998

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Abstract

In humans, as in most mammals, spermatogenesis is temperature dependent. This temperature dependence has been clearly demonstrated by several experimental studies showing that artificial increases in scrotum or testicle temperature in fertile men reduce both sperm output and quality. Our knowledge of the effects of occupational heat exposure on male fertility comes mostly from a small number of epidemiological studies. We conducted an extensive review of these published reports, focusing on methodology and design (retrospective or prospective; reference group; number of subjects) and principal results (using several indicators such as the time taken to obtain a pregnancy or sperm characteristics). We concluded that occupational heat exposure is a significant risk factor for male infertility, affecting sperm morphology and resulting in delayed conception. The limits and biases involved in this type of research are also discussed.

Topic: pregnancy, epidemiologic studies, fertility, male infertility, mammals, spermatogenesis, sperm cell, body temperature, scrotum, temperature, testis, conception, heat exposure, experimental study

Occupational exposures where men whose testicles are exposed to heat are more likely to become infertile. According to this review from the journal of Human Reproduction, men with sperm abnormalities have 1.8 times heat exposure and men diagnosed with idiopathic infertility have 1.6 times greater heat exposure than the fertile controls.

In the same review, time to pregnancy was significantly longer for couples ‘exposed to heat’ and seated more than 3 hours/day. Normal sperm in men exposed to heat is only 46% versus 64% in the male controls.

According to the researchers, male heat exposure appears to have a deleterious effect on male fertility and must be considered a significant risk factor for male infertility.

Link to the study

Alcohol and smoking leads to a 39% greater sperm DNA damage in men.

According to a study published in the Andrologia journal, cigarette smoking and alcohol intake are the two ‘major lifestyle factors with a negative impact on fertility’. The researchers tested sperm of infertile men with ‘normal’ conventional sperm parameters but with unexplained infertility in assisted reproduction. The ‘smoking’ group showed 31% greater DNA damage exceeding the normal range, while the ‘alcohol-smoking’ group had 39% DNA damage.

Link to the study

Weight/Lifestyle

Lifestyle habits can affect sperm motility, sperm concentration and success rates in ICSI cycles.

In men undergoing ICSI cycles, men with a higher body mass index (BMI) or who consume alcohol on a regular basis have lower sperm concentrations than men who don't. On the other hand, men who smoke, consume alcohol, or have a high BMI, have poor sperm motility.

The researchers also observed that men who consumed alcohol have poorer fertilization rates, while men who consumed red meat or who were on a weight loss diet have lower implantation rates. Men who were on a weight loss diet and who consume red meat also had a lower overall pregnancy rate.

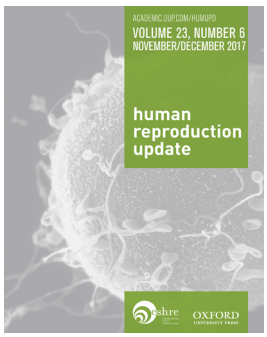
Link to the study

Women with higher BMIs have higher infertility rates.

According to a review published in the Obesity Reviews journal, women with a BMI of 30 and above have higher rates of infertility and amenorrhea. During pregnancy, these women have a higher risk of complications such as gestational diabetes and hypertension. Women with higher BMIs also have higher Caesarean section rates and longer delivery times compared to normal weight women.

Link to the study

Weight loss in overweight and obese men and women with infertility improves pregnancy outcomes.



According to a review involving 40 studies (14 of which were randomized clinical trials), non-surgical weight loss interventions led to better pregnancy and live birth rates. In women, exercise and reduced caloric intake resulted in weight loss, ovulation improvement and increased pregnancy rates.

Link to the study

Weight loss improves fertility and pregnancy outcomes and decreases miscarriage rates.

In a study which enrolled obese infertile women into a weight loss programme (diet, exercise and lifestyle changes) for 6 months, participants who completed the program had better fertility rates.

About 90% of anovulatory women who completed the program resumed spontaneous ovulation, 87% of whom achieved pregnancies and 75% achieved a live birth. Miscarriage rates for these women decreased to 18% compared to 75% prior to the program.

Link to the study

FERTILITY COACH™