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Original Research

Magic Medicine

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Abstract

Background
A superstition is a belief or practice that is considered irrational, resulting from ignorance, fear of the unknown, trust in magic or chance or a false conception of causation. In medical settings superstitions often arise from attempts to assign causation to events that are either random, or in which all information is not available. In this manuscript, we present a descriptive review of the literature related to superstition in medicine and present the results of our own data; that one's age is equal to the chance of being admitted from the emergency department.

Methods
In the descriptive review of superstitious beliefs in medicine, we identified 295 articles in which specific superstitions were studied. These articles were then organized by field and specific superstition. To investigate the age and admission correlation, we retrospectively quarried over 250,000 charts.

Results
295 papers on specific medical superstitions were reviewed and presented according to specialty, population and commonly investigated superstitions. Psychiatry had the largest number of articles addressing superstitious behavior, followed by OB/GYN. Importantly, significant heterogeneity exist within these papers suggesting that superstitious beliefs can be found in all fields of medicine. In addition, our data did not support the superstition that a patient's age will mirror their admission rate.

Conclusions
The majority of the superstitions identified were "harmless" in that they would not result in significant patient harm. The exponential growth in medical knowledge presents a challenge for many to stay up to date. Our findings suggest a need for a continued emphasis of scientific literacy among physicians and further establish the expectation that physicians be engaged in consuming the latest scientific evidence in their field.

Keywords
superstition; traditional medicine/psychology legend; myth; irrational belief; full moon; McClintock effect; Throckmorton; black cloud; Christmas effect; jinxed; bao; Friday the thirteenth; attitude of health personnel

Introduction
A superstition is a belief or practice that is considered irrational, resulting from ignorance, fear of the unknown, trust in magic or chance or a false conception of causation.[1-3] In medical settings, superstitions can be inherited from more experienced physicians or acquired through experience, often from attempts to assign causation to events that are either random or for which all information is not available. Superstitions are persistent, even when confronted with evidence to refute them.

In this descriptive review of superstitious beliefs in medicine, we will explore the published literature where specific beliefs have been studied and often re-studied repeatedly in an attempt to show they are true.[4] Historically, superstitious beliefs about how the body functions (e.g., humor) resulted in medical practices that caused significant harm. For example, drill-

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ing a hole (i.e., trepanation) in your head to let your brain "breath" was used to treat ailments like headaches, epilepsy or possession by evil spirits.[5] Other interventions such as blood-letting, mercury administrations and tapeworm introduction were prescribed without a full understanding of the consequences.

Interestingly, some superstitious beliefs held kernels of truth or produced desirable outcomes, but not for the expected reasons. For example, the occurrence of malarial fevers was attributed to the lunar phases in India in 1869, by WJ Moore.[6] While clearly, the moon itself did not cause the fevers, modern research suggests that the additional light of the moon increases mosquito activity and subsequently increases the likelihood of contracting malaria.[7]

In modern medicine, the influence of superstitions, especially superstitions that result in harmful practices, have been reduced. However, superstitions still influence medical belief and practice as evidenced by active, ongoing research and the outdated practices still being taught.[8] While typically harmless, these beliefs can bias decision-making.

To clarify all this, we investigated the literature on superstition as well as the specific anecdotal belief in the emergency department (ED) that a patient's age is the same as their admittance rate.

Methods

Literature Review for Superstition

Our literature review focused on three fundamental categorizations: superstitions by specialty, country and supportive evidence. This detailed descriptive review was performed using PubMed, Google, Google Scholar and bibliographies from referenced literature featuring specific notions found in the medical research. Search terms included: delusion, medicine, myth, full moon, Friday the 13th, red hair, July phenomenon, black cloud, jinxed, luck, period syncing, McClintock effect, Throckmorton, Emergency Department, nursing and birth. Initially, 301 papers were identified. Six were removed because of the inability to obtain meaningful information from the article. Thus, 295 published papers were reviewed. Papers were categorized according to the topic, specialty, year published, findings and region of origin.

Data Review for Age to Admission Ratio

Additionally, we queried the HCA Healthcare (HCA) data to evaluate the belief that the age of the patient is roughly equal to the chance of them being admitted to the hospital from the emergency department (e.g., A 10-year-old has a 10% chance of admission and so on). HCA's database for all ED visits from 2018 in the Capital Division, which includes fifteen hospitals in Indiana, Kentucky, New Hampshire and Virginia, were reviewed. These hospitals cover rural, suburban and urban areas. This analysis included 259,725 ED visits by patients aged 0–89. These visits were coded as discharged home versus admitted, deceased or transferred, which provides for deceased, observation, transferred or admitted. These data were deemed exempt from IRB oversight by the US Office for Research Protections rule 45 CFR 46.104(d) (4) or "Common Rule" (HHS, 2018).

Results

Superstition Rates by Specialty

As an emergency physician, I expected emergency medicine would be in the first place for papers involving superstitions, with obstetrics and gynecology in a close second. However, as **Table 1** reveals, psychology and psychiatry were more heavily represented than anticipated. This should not be surprising since, according to the landmark article by Boris Veysman[9] in December 2005, being unorthodox is a primary requirement to go into the field. Perhaps, the nature of psychology and psychiatry results in a more nebulous interpretation of causation. In other words, they deal with more confounding factors. If we combined general medicine with internal medicine, psychology/psychiatry fields still reported more research on superstitions.

Superstition rates by origin

We looked at the location of the study population as well as the study authors in an attempt to identify the highest prevalence of superstitious beliefs in medical professionals. (**Table 2**) Some papers are from multiple countries.

The US had almost as many research articles on superstitions in medicine as the rest of the world combined. The reason may be because

Table 1. Articles attempting to prove or disprove a superstition, by specialty.

Specialty	Number of papers cited
Psych	74
OB/GYN	44
General Medicine	36
Emergency	29
Neurology	16
Surgery	15
Anesthesia	14
Internal Medicine	12
Orthopedics	8
Trauma	8
Vets	7
Otolaryngology (ENT)	5
Pediatrics	5
Cardiology	4
Gastroenterology	3
Radiology	3
Nursing	2
Urology	2
Architecture	1
Endocrine	1
Hematology	1
Immunology	1
Nephrology	1
Ophthalmology	1
Podiatry	1
Rheumatology	1
Toxicology	1

Table 2. Articles by country.

United States	130
United Kingdom	25
Canada	20
Germany	20
Switzerland	10
Austria	8
Australia	6
Italy	5
Japan	4
Czechoslovakia	3
Denmark	3
Finland	3
Iran	3
Israel	3
Netherlands	3
Singapore	3
France	2
Greece	2
Hungry	2
Pakistan	2
Poland	2
Scotland	2
South Africa	2
China	2
Jamaica	1
Lebanon	1
Lithuania	1
Mozambique	1
Niger	1
Qatar	1
Republic of Seychelles	1
Slovenia	1

the US has approximately 174,000 doctorate degrees awarded each year, most of which require research component.[10]

Further patterns arose when combining geography with the ratio of studies that support or refute a superstition. Of the 44 countries involved, 24 had endorsed a superstition (positive), while 32 countries had studies that refuted a superstition (negative). Canada had the highest negative to positive ratio. The combined Eastern European countries had twice as many positive vs. negative papers. As an example, one article from Slovakia looked at the incidence of recurrent atrial fibrillation and the presence of the full moon.[11] There was a strong correlation, but the paper did not achieve recognition because the number of study subjects was one and that one person was the author!

Table 3. Quantitative studies with greater than one review on a topic.

Topic	Positive: Negative	Odds
Lunar	43:144	0.3
Red hair	5:7	0.71
McClintock Effect	4:7	0.57
Friday the 13th	5:7	0.6
Throckmorton	2:5	0.4
Black clouds	3:2	1.5
Weather and deliveries	2:0	2

Commonly Investigated Superstitions

Significant themes with many possible variations:

- Full Moon (Transylvania effect): 210 papers on different issues were found. Examples are abdominal aortic rupture, absenteeism, acute diarrhea, acute myocardial infarction, the aggression of hockey players, appointments at thyroid clinics, atrial fibrillation, babies born, breast cancer survival, burns, contraception, crimes, dog bites, drug overdose, emergency department admissions, epistaxis, gastrointestinal bleeding, hospital falls, in vitro fertilization, increased aggression, increased psychiatric patients in the ED, nausea and vomiting, nursing home resident agitation, perioperative complications, physical fitness, post-surgical pain, prison violence, renal colic, seizures, self-poisoning, spontaneous abortions, stroke, suicide, traffic accidents, trauma, and women menses.
- Redheads: 16 papers on increased bleeding and increased anesthetic requirements for redheads.
- McClintock Effect: 14 articles on menses syncing in women living in close quarters.
- Throckmorton: 9 essays on the penis pointing to a fracture.
- Friday the 13th: 9 papers on ED services, traffic accidents, trauma and clinic caseload related to Friday the 13th.
- Black cloud residents: 6 pieces on the repetitive challenge of on-call for specific residents.
- Bad weather: 3 papers on climate precipitating women to go into labor.
- Werewolves: There was 1 study in 2016 by Chaput, who looked at the sleeping habits of children as related to the full moon to find out if they are werewolves. The study showed the children slept an average of five minutes less per night with a full moon. This involved children from 12 different countries.
- The Q word: 1 paper on if saying “quiet” in the ED causes a spike in volume.
- Bean bun intake (Bao): 1 writing on the perceived difficulty of night call correlated with the number of bean buns eaten for dinner.
- Jinxed: 1 essay on saying “Have a great day,” causing the opposite.
- Christmas Effect: 1 paper on the spike in births around Christmas.
- Threes: 1 article on adverse outcomes occurring in a sequence of three.

Some other honorable mention topics were the evil eye, luck, geomagnetic storms and editorials and rebuttals on other papers. Some of the papers include criticisms of the methods of various positive studies. **Table 3** contains an overview of the studies. Some studies addressed more than one topic.

Results for Age to Admission Ratio Belief

Results are summarized in **Figures 1 and 2**. An HCA Healthcare analyst de-identified and delivered the data. Our results do not support the superstition that age is equal to the admission rate. The age and admission rate was the same only for 2-year-olds. (**Figure 1**) **Figure 2** demonstrates that the frequency of ED visits by those age 65 and older is similar to prior studies.[12,13]

Discussion

There is significant heterogeneity in each group

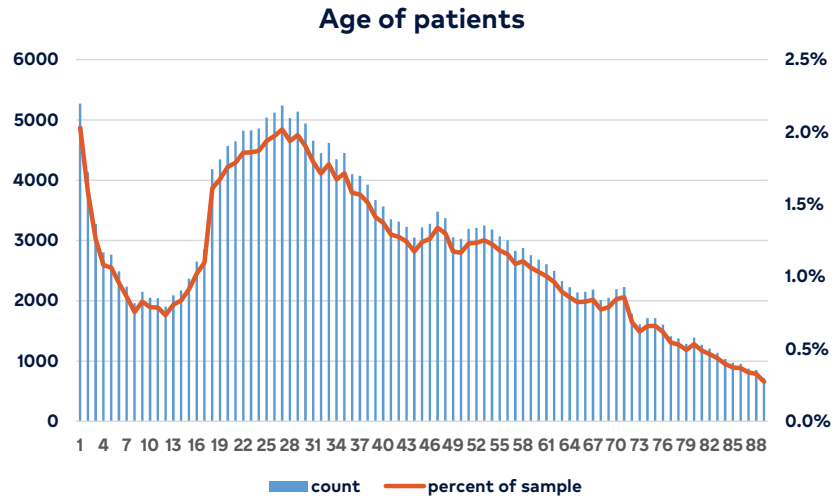

Figure 1. Admission rate compared to age.

with different measures, populations and comparisons. However, there are some vital takeaway points. We might consider augmenting the obstetric staffing during a storm since there will be increased births. However, there is no need to expand the emergency room staffing on Friday the 13th. Do not be afraid to give a redheaded patient more lidocaine; they will not disproportionally bleed. Some providers can always make life more difficult for others, as well as themselves, and as such, they create black clouds. Pay no attention to the penis on the film. Throckmorton is of no help.

Future Research

Several other pertinent questions deserve mention. The following phenomena have been collected from physicians and nurses around the world by the author. Some have ongoing research projects to help clarify if they are true or not.

- A ratio of white blood cell count to hemoglobin of greater than one is terrible.
- Crossed legs or texting upon ED entrance on a gurney means you will be discharged home.
- Hospital noise calls patients like a street vendor yelling gets customers.
- If you completely clear the tracking board, you will get slammed.
- A patient that is saying, "I feel like I'm going to die" will.
- Patients follow a herd mentality and come as a bolus.
- Blue or green-eyed patients are bad because they are too powerful.

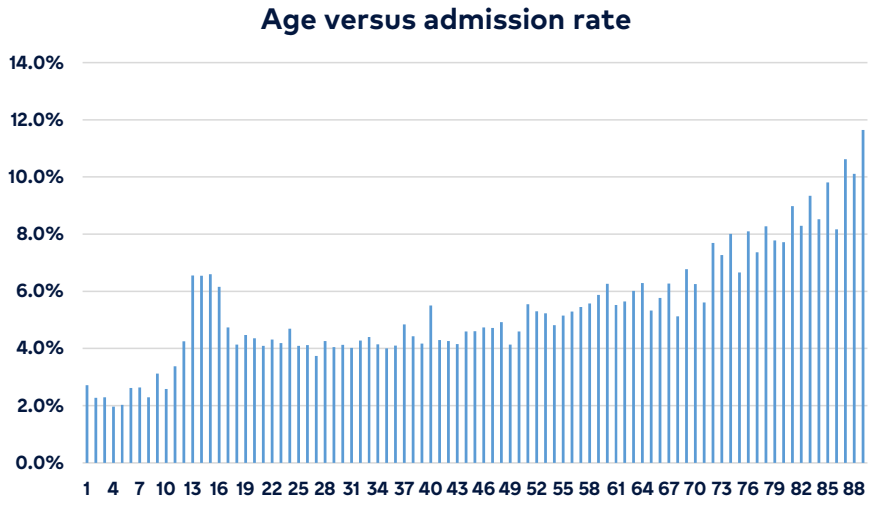

Figure 2. Number of patients in age groups with admission.

- Never leave scissors open on a tray because that means someone will be talking about you.
- Women come to the ED for less severe complaints than men.
- French's Mustard is good for burns.
- Hanging a peeled onion from the ceiling helps to fight infection.
- You should leave hospital windows open to let the evil spirits out.
- Surgeons should check the almanac to see if the patient is going to bleed.
- Antibiotics plus saline to wash out the abdominal cavity is better than plain saline.
- Wearing a Sam splint orange-side-out is to be seen, but wearing one blue-side-out is for athletes.
- A patient talking with their eyes closed during the interview is not sick.
- Eating potato chips in an emergency room means you do not need to go to the operating room for belly pain.
- Cardiologists should urinate before an intervention in the Cath lab to keep complications away.
- Teddy bear sign: If a girl in her 20's is in the Intensive Care Unit, has a doting mother and a teddy bear on the bed, her symptoms are psychosomatic.
- Tachy-Lordy syndrome: An older woman in bed crying, "Oh Lordy, Lordy, Lordy," will fare better than the one saying, "Lordy, Lordy."

Conclusion

Most of these superstitions are both harmless and entertaining. Interestingly, developed countries are not immune to magical or outdated thinking. Physicians have the responsibility to stay current in their knowledge and practice superstition-free. The art of medicine is for the interpersonal interactions with patients or areas where there is no clear standard, not for cutting corners or outdated practices.

There have been eras when the doubling time of medical knowledge was 50 years. Currently, it is estimated at 73 days.[14] It is up to us to stay current in our thinking and expertise and not to blame the touches of humor for illnesses.

Conflicts of Interest

The authors declare they have no conflicts of interest.

Dr. St. Amour is an employee of LewisGale Medical Center, a hospital affiliated with the journal's publisher.

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