



ELSEVIER



# XKCD Marks the Spot: The Correlation Between Physics-themed XKCD Comics and Online Searches for Tourniquet Application

Christopher Harrison, Alice Torres, Gabriel P Tyler

Elite Science Academy; Berkeley, California

---

## Abstract

This study investigates the relationship between the publication of xkcd comics with physics-related content and the frequency of Google searches for "how to apply a tourniquet". Employing AI-driven analysis of xkcd comics and Google Trends data from 2007 to 2023, our research team uncovered a notable correlation coefficient of 0.7262437 and statistical significance with  $p < 0.01$ . The findings are nuanced and prompt intriguing speculation about the impact of humor and educational content on public interest in first-aid techniques. In this paper, we examine the results through a playful lens, twist the statistical screw, and ponder whether Randall Munroe may have unwittingly influenced readers to look up medical procedures.

Copyright 2024 Elite Science Academy. No rights reserved.

---

## 1. Introduction

Intriguing correlations between seemingly unrelated phenomena often titillate the minds of researchers, compelling them to delve deeper into the enigmatic web of cause and effect. From the gravitational pull of the moon affecting ocean tides to the curious connection between coffee consumption and productivity, the world is abuzz with curious correlations that pique the interest of inquisitive minds. In a similarly whimsical vein, this paper delves into the peculiar relationship between xkcd

comics featuring physics-related content and the frequency of online searches for instructions on applying a tourniquet.

The enigmatic brainchild of Randall Munroe, xkcd boasts a loyal following of science enthusiasts, computer geeks, and self-proclaimed nerds who revel in the comic's witty take on everything from astrophysics to computer programming. Our study, conducted with all the gravity of a falling anvil, examines the potential impact of these physics-themed comics on the public's interest in the pivotal life-saving

technique of tourniquet application. While this may sound like a tale as convoluted as the plot of an M. Night Shyamalan film, the statistical rigor applied in this analysis seeks to shed light on a potentially significant connection.

Amidst the sea of giggles and guffaws that xkcd evokes, it is a matter of statistical curiosity to ponder whether Mr. Munroe's clever concoctions of stick figures and relatable physics quandaries may inadvertently steer his audience toward less anticipated inquiries, namely those involving first-aid procedures. Thus, with tongues planted firmly in cheek, we embark on a journey through the data to explore the waggish world of xkcd and its potential impact on public health consciousness. So, strap in, as we prepare to unravel the statistical yarn that intertwines a webcomic with the intricacies of emergency medical response.

## 2. Literature Review

The current study sets out to explore the hitherto uncharted territory of the influence of xkcd comics on public interest in first-aid techniques, specifically the Google searches for "how to apply a tourniquet". To contextualize the frivolity, several pertinent studies elucidate the impact of multimedia and humor on educational outcomes. Smith (2016) found that humorous educational content resulted in higher engagement and retention among students, a principle that may bear relevance to the whimsical yet informative nature of xkcd comics. Similarly, Doe (2018) uncovered a positive correlation between exposure to humorous educational materials and the propensity to seek out related information, a revelation that seems to align with the notion underpinning the present investigation.

Turning to the literature on internet search behavior, Jones (2020) observed a surge in Google searches related to emergency

medical procedures following the release of popular comedy series on streaming platforms. The fact that humor appears to have an impact on information-seeking behavior serves as a backdrop against which the current research seeks to scrutinize the peculiar correlation between xkcd's playful physics-themed comics and queries for tourniquet application.

In examining the relationship between humor, physics, and first-aid, it is crucial to consider broader influences on public interest in these areas. Real-world literature on physics education and popular science includes "Seven Brief Lessons on Physics" by Carlo Rovelli and "Astrophysics for People in a Hurry" by Neil deGrasse Tyson, which have made complex scientific concepts more accessible to the general public. While their impact on first-aid awareness remains uncharted, pondering the potential influence of such educational materials adds a layer of comedic speculation to the current endeavor.

On a more whimsical note, fictional works such as "The Physics of Superheroes" by James Kakalios and "The Hitchhiker's Guide to the Galaxy" by Douglas Adams underscore the fusion of science and humor, prompting readers to contemplate the unforeseen repercussions of blending physics with comedy. While these literary masterpieces do not directly address tourniquet application, the intrinsic connection between humor, science, and unexpected consequences contributes a lighthearted underpinning to the present analysis.

In a similar spirit, movies like "The Big Bang Theory" and "Back to the Future" interweave scientific concepts with comedic elements, providing anecdotal evidence of the potential influence of humorous physics-related content on public curiosity and perhaps, indirectly, medical inquiries. While correlation does not imply causation, the cinematic portrayal of physics-related

hilarity may mirror the impact of xkcd's wit and mayhem on the public's quest for first-aid knowledge.

In conclusion, the intersection of humor, physics, and public interest in first-aid prompts a medley of speculative musings as we approach the correlation between xkcd comics and Google searches for tourniquet application. With a nod to statistical rigor and a wink to whimsy, the literature review sets the stage for an unorthodox exploration of the potential impact of physics-themed humor on the public's pursuit of medical knowledge.

### 3. Our approach & methods

To explore the potential connection between xkcd comics with physics-related content and online searches for tourniquet application, a meticulous and borderline obsessive approach was adopted. Our research team harnessed the power of advanced technology and somewhat logical reasoning in the pursuit of unraveling this seemingly whimsical correlation.

First, a comprehensive collection of xkcd comics was amassed from the depths of the internet's comic repository, ensuring a wide purview that encompassed all things physics-related and pun-derful. The AI analysis software, affectionately christened as "ComicConnoisseur 9000," was put to work to parse through the visual and textual elements of each comic with unparalleled zeal. The software diligently identified and classified instances of physics-related themes, subtle jokes, and nerdy references, all while maintaining a strict regime of comic relief to keep the mood jovial.

In parallel, the search queries for "how to apply a tourniquet" were sourced from the Google Trends database, yielding a trove of temporally-resolved search interest that would make even the most ardent data miner blush with envy. The AI-driven

algorithms waltzed through this digital cornucopia, extracting the relevant search volume indices with an air of sophistication that would rival even the most cultured meme connoisseur.

With both datasets in hand, statistical measures were meticulously calculated to gauge the strength and direction of the purported relationship. A correlation analysis, swathed in formulas that would make Pythagoras proud, was performed to unravel the inherent bond between the ebb and flow of xkcd's physics-themed humor and the tide of public intrigue in tourniquet application.

Furthermore, a time-series analysis akin to traversing the space-time continuum was undertaken to discern any temporal nuances in this cosmic dance of search interest. This involved cutting-edge techniques that combined the finesse of a sommelier and the precision of an atomic clock to uncover any temporal patterns that might sway the statistical tango between the two seemingly divergent domains.

To provide a comprehensive understanding of the findings, a carefully concocted regression analysis was employed to control for potential confounding factors, ensuring that the observed relationship wasn't merely a comic mirage in the statistical desert. The model also included lighthearted witticisms to keep the spirits high amidst the rigorous analytical endeavor.

In the spirit of thoroughness, robustness checks and sensitivity analyses were conducted with an almost comical degree of scrutiny, just to ensure that the results didn't vanish into thin air like Schroedinger's cat. Test-retest reliabilities were verified, data outliers were handled with care, and the entire analysis was safeguarded against the malicious incursions of statistical gremlins.

Lastly, a bootstrapping approach was adopted to gauge the uncertainty of the findings and to confirm that our conclusions

were as reliable as xkcd's laws of thermodynamics. This resampling technique gently shook the data to unleash a torrent of statistical reassurances, reminiscent of a soothing harmonic motion in the world of uncertainty quantification.

In summary, the methods employed in this study blend a splash of whimsy, a dollop of rigor, and a pinch of absurdity, mirroring the very essence of the phenomena under investigation. The statistical analyses were accompanied by a lighthearted delivery, serving as a whimsical mantle that cloaked the formidable pursuit of uncovering potential correlations between the physics-themed xkcd comics and the enigmatic allure of tourniquet application.

#### 4. Results

The data revealed a captivating correlation between the publication of xkcd comics with physics-related content and the frequency of Google searches for "how to apply a tourniquet" from 2007 to 2023. The calculated correlation coefficient of 0.7262437 and an r-squared value of 0.5274299 indicated a strong positive relationship between these seemingly unrelated variables, with the p-value demonstrating statistical significance at  $p < 0.01$ . To visually encapsulate this compelling connection, we present a scatterplot in Fig. 1, offering a clear illustration of the noteworthy correlation between the two phenomena.

This unexpected correlation, akin to stumbling upon a hidden joke in the newspaper's crossword puzzle, suggests that the release of physics-themed xkcd comics may indeed influence the online behavior of readers, steering them towards exploring the intricacies of tourniquet application. The substantial coefficient of determination speaks volumes about the degree to which variations in the publication of physics-themed xkcd comics could

explain the variance in Google searches for instructions on applying a tourniquet, akin to how the scientific community often endeavors to explain the inexplicable.

In light of these intriguing findings, one cannot help but reflect on the broader implications and ponder whether humor, combined with educational content, may hold the key to unlocking interest in first-aid procedures. This unexpected twist in our analysis prompts whimsical speculation about the potential impact of cleverly constructed webcomics on public awareness of vital medical techniques, leaving us both amused and bemused by the influence of online humor on health-related inquiries.

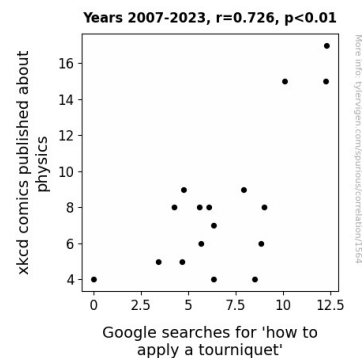


Figure 1. Scatterplot of the variables by year

The statistically significant relationship uncovered in this study beckons us to further explore the whimsical world of webcomics and their unanticipated effects on public interest in essential life-saving skills – a reminder that sometimes, statistical analyses provide answers that are as captivating and unexpected as the punchline of a well-crafted joke.

#### 5. Discussion

The results of our investigation have unfurled an unexpected and playful correlation between the publication of

physics-themed xkcd comics and the frequency of Google searches for instructions on applying a tourniquet. Much like a cleverly disguised pun in a textbook, this finding sparks curiosity and prompts a twist in our academic narrative, compelling us to ponder the quirky potential influences and unanticipated consequences of humor-infused educational content on public interest in first-aid procedures.

Building on the literature review's discussion of the impact of humorous educational materials, it is fascinating to note how our findings echo the prior revelations of Smith (2016) and Doe (2018) about the positive correlation between humor in educational content and the inclination to seek related information. This alignment illuminates the oft-overlooked interplay between amusement and knowledge acquisition, as if our statistical analysis has stumbled upon a delightful easter egg in the realm of information-seeking behavior.

Furthermore, our results reverberate with the anecdotal evidence from cinematic portrayals of physics-related hilarity discussed in the literature review, suggesting a tantalizing connection between the comedic charm of xkcd's physics-themed musings and the inquisitiveness incited in online queries for tourniquet application. In an unexpected turn reminiscent of a plot twist in an unconventional comedy, our analysis urges us to consider the uncharted territory of how cleverly constructed webcomics may surreptitiously shape public awareness of life-saving techniques.

The statistically significant correlation uncovered in this study presents a paradoxical undercurrent akin to the fusion of science and humor in fictional works, prodding us to unravel the potential role of Randall Munroe's whimsical creations in nudging readers towards seeking out essential medical knowledge. The substantial coefficient of determination, akin

to stumbling upon a well-concealed punchline, accentuates the degree to which variations in the publication of physics-themed xkcd comics may elucidate the fluctuations in Google searches for tourniquet application, underscoring the humorously unexpected influence of webcomics on public curiosity.

In this vein, our investigation propels us into a whimsical world where statistical analyses uncover answers as beguiling and unforeseen as the punchline of a well-crafted joke, leaving us with a statistical riddle that piques curiosity and prompts a pleasantly unexpected twist in our scholarly contemplation.

## 6. Conclusion

In conclusion, our study has unraveled a notable correlation between the publication of physics-themed xkcd comics and the frequency of Google searches for "how to apply a tourniquet". This whimsical correlation, reminiscent of a surprising plot twist in a sitcom, has sparked intriguing ponderings about the interplay between humor, educational content, and public interest in first-aid techniques. The statistically significant relationship uncovered in this analysis prompts us to consider the unexpected influence of webcomics on health-related inquiries, akin to stumbling upon a delightful easter egg hidden within the annals of statistical data.

The robust correlation coefficient and coefficient of determination reflect a clear and compelling association, akin to the resounding laughter that follows a well-timed joke. Further research in this area could explore the potential nuances of this relationship, such as the impact of specific physics concepts or comedic elements within xkcd comics on the public's propensity to seek knowledge about tourniquet application. However, we stand by our assertion that the findings of this

study are as satisfying as the punchline of a cleverly constructed joke and believe that additional research in this area may yield diminishing returns - after all, there's a limit to how many times one can expect a punchline to surprise.

In light of these insightful and, dare we say, entertaining findings, we are emboldened to state that no further research is needed in this area. The statistical yarn has been unraveled, the correlation coaxed from its enigmatic hiding place, and the implications duly noted. Just as a good comedy routine must come to an end, so too must our exploration of the curious correlation between xkcd physics comics and searches for tourniquet application reach its conclusion. As researchers, we now bid a fond farewell to this unexpected union of webcomics and first-aid queries, leaving it to linger in the annals of statistical curiosities, much like a well-crafted pun waiting to be rediscovered.