

# Christmas Break: Predictive Value of Holiday Avian Wishbone Traditions Among Frontline Healthcare Workers in a Prospective Trial

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**Objective:** To assess the impact of winning a wishbone contest on the likelihood of subsequent goal attainment.

**Design:** Prospective cohort study.

**Setting:** A large urban academic emergency department in the United States.

**Participants:** 40 frontline emergency department clinicians including supervising and resident physicians and physician assistants. Participants were enrolled between December 8, 2023 and January 10, 2024 and followed for three months.

**Main Outcome Measures:** The primary outcomes were feasibility of performing wishbone contests in the emergency department and attainment of a pre-specified wish by the end of the three-month follow-up period.

**Results:** Forty participants who met eligibility criteria were enrolled in the study and 37 completed follow-up at three months. Half identified as female and professional roles (resident physician, attending physician and physician assistant) were equally distributed. Overall, 38% of wishes were realized at three month follow-up. There was no association between winning the wishbone competition and realizing the wish. Participants who perceived a greater degree of control over the outcome of their wish were more likely to have their wish realized (RR1.2, 95% CI 1.05–1.37).

**Conclusion:** Frontline healthcare workers will engage in luckiness-boosting wishbone contests even in a busy emergency department environment. In our study, there was no association between winning the wishbone competition and goal or wish achievement. Participants who reported and perceived a greater degree of control over the outcome of their wish, however, were more likely to have their wish realized. Holiday cheer and wishful thinking traditions may indicate the feasibility of future work in extending positive thinking among frontline healthcare workers.

**Keywords:** positive thinking, Turkey, wishbone, affect, emergency medicine, training, luck, cognitive training

## Introduction

Superstition has long been a focus in behavioral science. Specifically, the cognitive (ie, decision-making, self-efficacy) and subsequent behavioral consequences (ie, task performance, goal attainment) of superstition is examined in an effort to understand human response to seemingly irrational beliefs.<sup>1</sup> In the extant literature, superstition is often explored as a general construct varying by individual rather than by specific population-level superstitious traditions. Studying specific traditions is crucial given the potential to leverage more ubiquitous superstitions to influence behavior. Further, exploration into superstition and behavior is majority contained to consumerism and athletics given the reliance on goal achievement within these areas.<sup>2,3</sup> However, there are many more areas in which task and goal achievement has significant implications. Therefore, to fill some of these gaps, the goal of this scientific inquiry is to preliminary explore a specific population-level superstitious tradition – the wishbone contest, within a specific population with critical necessity for goal achievement – emergency department healthcare workers.



The tradition of using avian wishbones to facilitate wish-making and subsequent goal attainment, popular in the holiday tradition of wishbone breaking, has been around for centuries. Anatomically, in a turkey, chicken, or goose, the wishbone or *furcula* is located at the base of the bird's neck.<sup>4</sup> The *furcula*, the Latin term for "little fork", acts to strengthen the thoracic skeleton by supporting the bird's wing strut. It connects the neck and sternum and equates to the bird's clavicle. The first documented use was among the Etruscan civilization in 800 BCE, Italy.<sup>5</sup> At that time, wishbones were extracted from deceased chickens and were dried, unbroken, in the sun. Once dried, the individual would gently touch the bone, and make a wish. Etruscans believed these birds were oracles capable of foreseeing the future, and by touching these sacred bones, wish-makers impacted their future.<sup>6</sup> The Romans adopted the tradition and transformed it into a competition: instead of just lightly touching it, they would engage in a tug-o-war type fight over pulling apart the wishbone. Following the combat, whoever walked away with the larger piece of the broken bone was likely to have their wish fulfilled. This tradition was carried to the Britain Empire in the 1400s, where the English incorporated the tradition into their autumn harvest feast using a dried goose wishbone called "merrythought". By the 1800s, the North American turkey wishbone traditions emerged during the Thanksgiving and Christmas holidays and continue today.<sup>7,8</sup> In the current holiday tradition of snapping a turkey wishbone, the V-shaped bone is meticulously cut out of the muscle and cartilage and dried in the oven before breaking.<sup>9</sup> Whoever is left holding the bigger piece of the clavicle, will have their wish come true – or so we wish to believe. To the best of our knowledge, this specific superstitious tradition and its implications for perceptions of goal achievement and goal-oriented behavior has never been studied scientifically.

Healthcare represents a field where goal achievement is critical with significant implications to individual patients and public health. Among clinicians, Emergency Department providers, in particular, operate within a dynamic, ever-changing environment and rely on achievement within a diverse knowledge base and skill set to ensure optimal patient outcomes, and at times, avert severe morbidity and mortality. Maintaining a sense of goal achievement within emergency medicine is challenging given high risk for burnout syndrome which is associated with perception of low personal accomplishment.<sup>10,11</sup> Superstitions often act as coping mechanisms for high-stress situations characterized by uncertainty and limited control– the very nature of emergency care and related burnout.<sup>12</sup> Further, superstitions significantly enhance task performance.<sup>13</sup> Taken together, exploration into how superstition may impact emergency medicine provider perception of goal achievement could provide insight into how to optimally leverage the positive impacts of superstition for frontline healthcare workers with implications for patient care.

In the context of wishbone contests, potential mechanisms through which goal achievement may be impacted include goal-setting, self-efficacy, positive affect, success expectancies, superstitious beliefs, controllability beliefs, and luckiness perceptions.

Wishbone contests act as a facilitator of goal-setting, relying on the individual to operationalize their wish and desired outcomes. For emergency medicine providers, such goal setting may have a significant impact. Healthcare trainees in many specialties, especially in emergency medicine, rely on goal setting early in their training to achieve the clinical competency needed to ensure goal achievement in patient care.<sup>14</sup> Moreover, clear goal setting supports organizational efficiency, mitigates medical errors, and ensures compliance with national safety standards, making it a crucial component of emergency medicine training and practice.<sup>15</sup> By operationalizing measurable objectives, providers can continuously evaluate and refine their approaches, leading to improved patient care and overall system performance.

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Establishment of ambitious, specific objectives has been linked to higher levels of performance and perception of success across fields beyond healthcare (including sports and academics) via increases in self-efficacy and emotion regulation.<sup>17</sup> Notably, emotion regulation is a primary factor in generation of positive affect.<sup>18</sup> Both self-efficacy and positive affect are strongly linked to goal-oriented behavior, improved performance, and success expectancies.<sup>19</sup> Success expectancies play a critical role in goal achievement by shaping motivation, effort, and persistence.<sup>20</sup> Research also suggests an association between superstitious thoughts and practices (eg, crossing fingers; saying "break a leg!") and improved performance across multiple tasks including athletics and motor/cognitive skills via increases in self-efficacy.<sup>21</sup> Superstition has also been linked to an increase in perception of control within unpredictable situations, which in turn, regulates emotions to produce more optimal performance leading to goal achievement.<sup>22</sup> Further, perception of luckiness

is associated with goal-oriented behavior and performance via self-efficacy and optimism – a specific form of positive affect produced by belief in good luck.<sup>23,24</sup> Together, these findings support a potential psychological-behavioral pathway from wishbone contest outcome to perceived or actual goal achievement.

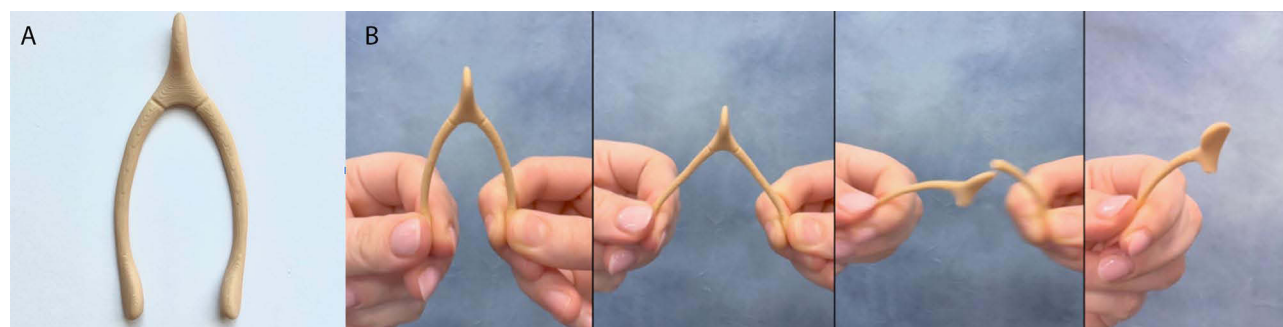
Therefore, in this study, we sought to examine the impact of wishbone competition results on goal achievement among frontline emergency department providers to explore the psychological-behavioral pathway and inform training practices. Specifically, the aims of this study were to a) test the association between wishbone contest outcome and perception of goal attainment and b) explore posited related psychosocial factors [goal-setting, self-efficacy, positive affect, success expectancies, superstitious beliefs, controllability beliefs, and luckiness perceptions] associated with perceived goal attainment. Given this is the first study of its kind, the study was preliminary and exploratory, thus no hypothesis were identified a priori.

## Methods

We carried out a quasi-experimental study within a large, academic, urban emergency department in the United States. The department is staffed by attending (supervising) physicians, physician assistants, and resident physicians from a four-year emergency medicine residency training program. Participants represented a convenience sample (N = 40) of residents, physician assistants, and attending physicians working in the emergency department.

Eligible participants were approached by the study staff for enrollment and provided informed consent. Participants were enrolled over the holiday season between December 8, 2023 and January 10, 2024. At the enrollment visit, participants completed a baseline psychosocial quantitative assessment that included basic demographics, perceived luckiness, and positive and negative affect schedule and were asked to develop and record a wish related to a clinical, professional, or personal goal. We included personal goals because individuals who achieve personal goals may indirectly perform better in their clinical setting. Additionally, due to the holiday spirit associated with the wishbone contest, we sought to provide the opportunity for participants to infuse their professional life with a reminder of the importance of personal goals. Participants were asked to ensure that the wish had a binary outcome and was achievable within a three-month timeframe.

Next, participants were paired into dyads on a convenience basis for the wishbone contest. We used three-dimensional (3D) printed polylactic acid wishbones for the contest, pre-scored on either side at even intervals to provide a 50% chance of each participant winning (Figure 1). A printed wishbone was evaluated by a United States Department of Agriculture (USDA) certified butcher who verified the equivalent brittleness of the 3D-printed wishbone compared to an actual live-baked turkey wishbone. For the contest, each participant grasped the distal end of the wishbone and together pulled apart the wishbone. Winning the wishbone contest was defined as retaining the larger portion of the wishbone after it was broken. After a winner was determined and announced, participants completed a post-contest self-reported assessment of their estimated probability of winning their next wishbone contest and the probability that their wish would be realized in three months. Enrollment and engagement with the wishbone contest occurred within the emergency department. The contest itself was completed in clinical care areas accessible only to healthcare workers and was



**Figure 1** Image of 3D printed Turkey wishbone pre-scored at equidistant locations from the center vertebrae (**A**). When pulled by two individuals, the wishbone fractures at the pre-scored locations (**B**).

supervised by a member of the study team. Results of the contest were clearly apparent to the participants but were not announced to the overall emergency department. The study team members specifically were trained to project a neutral affect in order to not alter the degree of cheer within the department. Training in maintaining a neutral affect was supervised by a member of the study team who is a clinical health psychologist. No congratulations were offered to the winner nor condolences to the loser. Finally, participants were followed-up at three-months after the baseline visit to ascertain wish fulfillment. At the three-month follow-up, we also asked participants to complete the luckiness scale and positive and negative affect schedule. All measures are detailed below.

All procedures and study materials were approved by the Mass General Brigham (MGB) Institutional Review Board.

## Patient and Public Involvement

Patients and the public were not involved in the design of this study. We did have a UDSA certified butcher evaluate 3D printed wishbones prior to use.

## Measures and Variables

### Sociodemographics

Participants self-reported age, gender (not restricted to binary options), and clinical role.

### Success Expectancies

We asked participants to estimate the probability (0–100%) of their potential success in the wishbone contest prior to playing the wishbone game. Participants also estimated the probability of ultimately fulfilling their wish prior to playing the wishbone game and as part of the post-contest assessment.

### Type of Goal-Setting (the “Wish”)

Each wish was classified by author consensus based on content into one of the three mutually exclusive categories: clinical wishes (eg “within three months I hope to have attempted an intravenous central line placement”), professional wishes (eg “three months from today, I wish to have both of the papers I am working on accepted for publication”), and personal wishes (eg “I wish to visit home more than once before the end of the calendar year”).

### Perceived Luckiness

We utilized a Luck Tendency Questionnaire in the baseline and three-month follow-up assessments to assess participants’ self-perceived luckiness.<sup>25</sup> In this 4-item survey, participants reported on a 1–7 scale their agreement with statements related to luckiness or unluckiness to quantify their sense of personal luck. The difference between scoring on statements regarding luckiness and unluckiness yielded a final score: a positive overall score represented greater self-perceived luckiness, and a negative score represented self-perceived unluckiness.

### Self-Efficacy

To evaluate participant self-efficacy regarding their contest wish and goals in general, we asked participants to report their self-perceived degree of control over their wish being realized and their confidence in achieving any future professional goals; both using 1–10 Likert scales, prior to engaging in the contest and at follow-up.

### Affect

To evaluate the impact of participant affect on wish realization, we incorporated the Positive and Negative Affect Schedule short-form (PANAS-SF) at baseline and at three-month follow-up.<sup>26</sup> The PANAS-SF is a 20-item assessment in which participants report their frequency with different moods/emotions on a 1–5 scale, yielding scores for both positive and negative affect.

### Wishbone Competition Outcome

Following the wishbone contest, we recorded the outcome of the contest in each participant’s post-contest assessment.

### Wish Realization

At three-month follow-up, we asked participants to report if their goal (or wish) had been realized.

## Statistical Analyses

Descriptive statistics were examined for all study variables. Identified key demographics (gender, age, provider type) were examined as part of this exploratory study given research has shown that these may influence perceptions of achievement, motivation, and engagement in medical settings, with disparities affecting evaluations, provider burnout, pay inequities impacting motivation, and response to competitive and goal-setting environments.

To explore factors associated with wishbone competition success, a series of log-binomial regression analyses were employed. Key demographic variables and baseline visit values for success expectancies (for winning the wishbone contest and achieving their goal/wish), luckiness, self-efficacy (controllability of and success expectancy of winning the wishbone contest, affect (positive and negative) were used predictors in bivariate models with wishbone competition success as the outcome.<sup>27–29</sup> We further examined the impact of the wishbone contest outcome on an individual's perceived probability of winning subsequent wishbone competitions as well as on wish attainment using a difference-in-differences analysis. Additionally, we explored demographic factors associated with a participant's perceived likelihood of wish realization via linear regression models.

To assess factors associated with goal attainment (wish realization), a series of log-binomial regressions were employed. Along with demographic attributes, we used baseline scores outlined above as well as the post-wishbone contest likelihood of wish realization in bivariate models with goal attainment as the outcome. To further explore predictors of goal-attainment, models were further adjusted for clinical role group and wish type.

Results are reported in Relative Risk (RR) ratios using an alpha level of 0.05. All analyses were conducted in Stata Version 17 (StataCorp, College Station, Tx USA).

## Results

### Participant Characteristics

Over the study period, a total of 40 participants were enrolled and completed the baseline survey and wishbone contest (Figure 2). Three participants did not complete the three-month follow-up survey and were deemed lost to follow-up. Characteristics of the study population are presented in Table 1. Overall, 50% (20/40) of the study population identified as female, 28% (11/40) were attending physicians, 40% (16/40) were resident physicians, and 33% (13/40) were physician assistants.

### Factors Associated with Wish Type and Perceived Feasibility (Goal Setting)

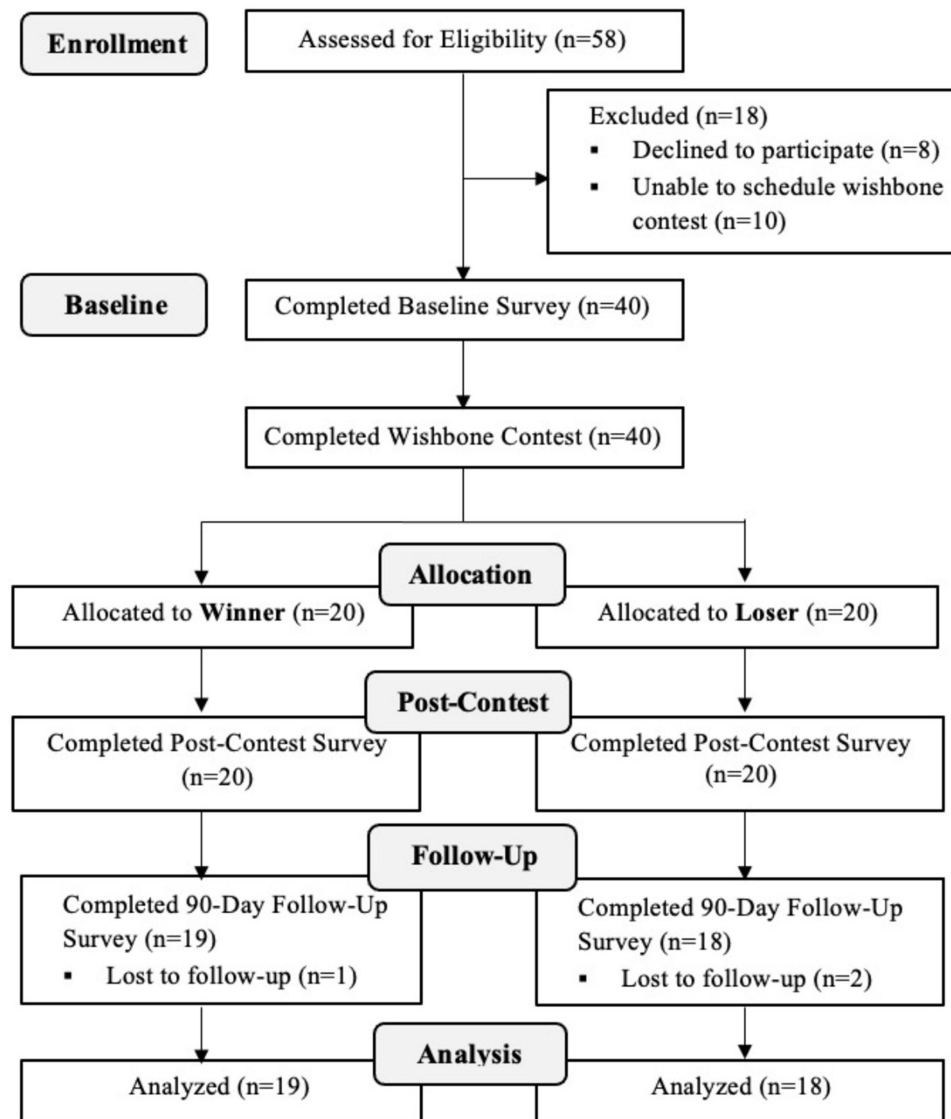
Following consensus classification, 53% (21/40) of all wishes were deemed clinical wishes, 40% (21/40) were professional wishes, and 8% (3/40) were personal wishes. Female participants were significantly more likely to make clinical wishes, while male participants were more likely to make professional or personal wishes (Relative-risk [RR] 2.17, 95% confidence interval [CI] 1.08–4.34). Additionally, resident physicians and physician assistants commonly made clinical wishes (63% and 85% of wishes, respectively), no attending physicians made a clinical wish, with 91% making professional wishes and 9% making personal wishes. With regard to likelihood of wish realization, there were no differences in the baseline perceived probability of wish realization by gender or clinical role group.

### Factors Associated with Wishbone Contest Success

There were no significant differences between wishbone contest winner and losers in demographic characteristics, perceived luckiness, positive or negative affect, or the baseline likelihood of wish realization (Table 1). Following the competition, based on difference-in-differences analyses, wishbone contest winners had a non-significantly greater increase in their perceived probability of subsequent wish fulfillment.

### Factors Associated with Perceived Goal Attainment (Wish Realization)

Overall, across the follow-up period, 38% (14/37) wishes were realized. There was no association between winning the wishbone competition and goal achievement (RR 0.95, 95% CI 0.41–2.16; Figure 3). Male participants were significantly



**Figure 2** Enrollment and participation of study subjects in the trial.

more likely to attain their goal (RR 3.33, 95% CI 1.10–10.14). After adjusting for clinical role group and wish type, however, those identifying as male had similar probability of goal attainment compared to females (adjusted RR 1.23, 95% CI 0.74–2.07). We observed no significant impact of age, positive or negative affect, or perceived control on wish

**Table 1** Participant Characteristics and Study Variables

	All Participants* (n=40)	Wishbone Contest Winners (n=20)†	Wishbone Contest Losers (n=20)†
Gender (n, %)			
Male	19 (48%)	11 (58%)	8 (42%)
Female	20 (50%)	8 (40%)	12 (60%)
Prefer not to answer	1 (3%)	1 (100%)	0 (0%)

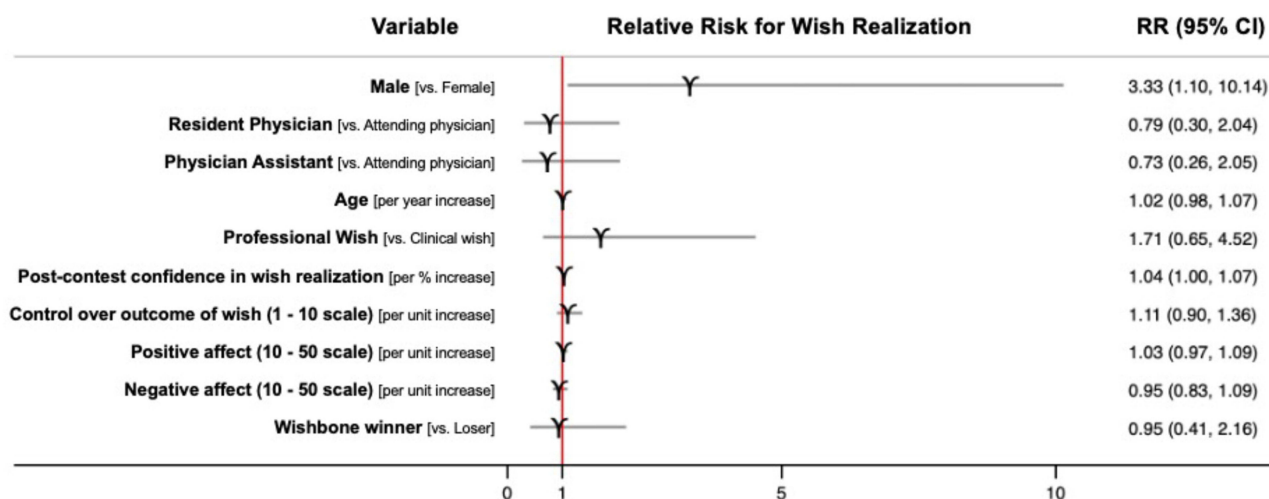
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**Table 1** (Continued).

	<b>All Participants* (n=40)</b>	<b>Wishbone Contest Winners (n=20)<sup>†</sup></b>	<b>Wishbone Contest Losers (n=20)<sup>†</sup></b>
Clinical Role (n, %)			
Attending Physician	11 (28%)	5 (45%)	6 (55%)
Resident Physician	16 (40%)	9 (56%)	7 (44%)
Physician Assistant	13 (33%)	6 (46%)	7 (54%)
Age in years, median (IQR)	30 (28–37.5)	29.5 (28–36)	30.5 (28.5–37.5)
Wish type (n, %)			
Clinical	21 (53%)	10 (48%)	11 (52%)
Professional	16 (40%)	8 (50%)	8 (50%)
Personal	3 (8%)	2 (67%)	1 (33%)
Pre-contest perceived probability of winning (%), median (IQR)	50 (50–51)	50 (47.5–55.5)	50 (50–50)
Luckiness (–6–6 scale), median (IQR)	2 (0–3)	1.5 (0–3.5)	2 (0–2)
Positive affect (10–50 scale), median (IQR)	33.5 (30–39.5)	33 (30–38.5)	35 (30.5–40)
Negative affect (10–50 scale), median (IQR)	16 (14–21)	16 (13.5–18.5)	19 (15–23)
Pre-contest perceived probability of wish realization (%), median (IQR)	60 (50.0–77.5)	55 (50–75)	60 (45–80)
Pre-contest perceived control over wish realization (1–10 scale), median (IQR)	6.5 (5–8)	7 (6–7.8)	6 (4.5–8)
Pre-contest confidence in achievement of any future goals (1–10 scale), median (IQR)	8 (7–8)	8 (7–8)	8 (6.5–8.5)
Post-contest change in probability of winning next competition (%), median (IQR)	0 (–5.5–10)	9.5 (0–17.5)	0 (–17.5–0)
Post-contest change in probability of wish realization (%), median (IQR)	0 (–4–10)	7.5 (0–12.5)	0 (–7.5–7.5)

**Notes:** \*Percentages in this column represent column percentages among all participants. <sup>†</sup>Percentages calculated across row, comparing wishbone contest winners and losers.

realization. Finally, while we did not observe an association of baseline perceived control over the outcome on wish realization, at the three-month follow-up, participants whose wishes were realized reported significantly greater perceived control over wish realization (RR 1.21; 95% CI 1.06–1.40).



**Figure 3** Relative risk of key variables to realization of the proposed wish.

## Discussion

Positive thinking, goal setting and professional development are important aspects of enduring training and practice in academic medicine. Developing healthy goal-setting habits and increasing perceptions surrounding luckiness can drive sustained increases in positive affect and self-efficacy—key features of sustainable success in clinical medicine. Channeling positive thinking and wishes, even if not attained, may help reinforce positive affect and self-efficacy in a career that can be stressful and riddled with psychosocial stress. A potential paradigm to consider is the traditional gathering of family and friends over the holidays which is used by many frontline healthcare workers to rest and rejuvenate from what can be a persistently stressful career (Personal communication, Dr. Edward Bowersox). Leveraging holiday tradition like the wishbone game could serve as a behavioral module reminiscent of the holidays to reinforce aspirational, positive goal setting. This investigation demonstrates that it is feasible, even within a busy emergency department to utilize the turkey wishbone contest, a tradition associated with holiday cheer and wishful thinking. It also motivates future work in extending portable positive thinking training among frontline personnel.

We were able to rapidly accrue participants in the study over a winter holiday period of five weeks demonstrating the feasibility of conducting a wishbone context even in a busy emergency department setting. In the midst of their busy clinical duties, participants were able to effectively identify wishes with academic or professional themes. It was also feasible to conduct follow-up assessments among study participants. We anticipate therefore that future use of holiday wishbones, or wishbones in general to promote positive thinking in emergency departments is likely feasible.

Winning the wishbone contest was not associated with achievement of the designated wish. In fact, only 38% of participants won the wishbone contest and also had their described wish come true. Importantly, individuals who felt a higher control over their wish had increased likelihood of their wish coming true. This finding suggests that the wishbone could be a vehicle to introduce the concept of positive thinking, wish development and self-efficacy across the spectrum of academic healthcare workers from those in training to those with established careers. It also suggests that potential targets for improving positive thinking may not only focus on building achievable wishes (goals), but also providing a vehicle that is reminiscent of the holidays, thereby transporting frontline healthcare workers out of a grueling shift into the familiar traditions and gatherings of family during the holidays. After all, who ever said that the holidays should only come once in a year?

Despite the wishbone contest we used in this study, it is important to note we detected significant gender differences in types of wishes. Wishers who identified as female tended to have clinical wishes and goals, which surrounded achieving proficiency or even just experience in performing emergency procedures while male wishers focused on professional goals. While our sample was small, even after adjusting for career stage, this association continued to be significant. This finding reflects other work demonstrating key gender disparities in emergency medicine surrounding clinical training, unrealized burdens of clinical tasks and access to procedural skills. Our work suggests that these disparities continue to be significant factors across the continuum of academic medicine and may impact perceptions of self efficacy and goal setting. It also suggests that efforts to address gender disparities in training have yet to be on the winning break of the wishbone.

This study further suggests that in future times of despair, emergency personnel could turn to their colleague, produce a wishbone and bring a small spark of holiday cheer and a boost in self-efficacy. While traditional wishbone contests have been conducted at the family dining table after dissecting the wishbone from within a perfectly roasted bird, modernizing the contest by using 3D printed wishbones that have equivalent brittleness renders the contest portable and allows the wishbone game to be played as part of a just-in-time intervention. The additional benefit of using 3D printed wishbones may be to expand inclusion of the wishbone contest to individuals who are vegetarian or vegan and thus may not typically participate in this tradition. Despite this, it is important to consider the use of biodegradable printing materials in crafting of wishbones in order to mitigate the potential environmental impact of increased use of 3D printed wishbones.

The study did have several limitations. First, our study was conducted at a single site, urban, academic teaching hospital where goal setting is emphasized in clinical training. Perceptions, luckiness and holiday cheer may vary based on other study sites. Second, our study was a pilot and not statistically powered for our secondary outcomes. Despite this,

our preliminary findings suggest that wishbone contests or similar cultural traditions could be explored for frontline healthcare worker wellness, especially during holiday seasons. Third, we did not enroll a control group who did not engage in the wishbone contest. Findings from the study may therefore lack separation from the organic holiday cheer that tends to permeate all sectors of healthcare during the holidays. Fourth, we only enrolled academic emergency medicine clinicians. Willingness to set goals, wish types and successes may vary based on clinical setting and specialty. Fifth, this study was completed in the months prior to the winter holidays where a rotating clinical schedule facilitates a break in clinical time for a majority of clinicians. While we anecdotally detected a sense of holiday cheer even three months prior to the holiday block, perceptions of luckiness, willingness to engage in a wishbone contest, and the types of wishes made may vary during the holiday period.

## Conclusion

Frontline healthcare workers will engage in luckiness boosting wishbone contests even in a busy emergency department environment. In our study, there was no association between winning the wishbone competition and goal or wish achievement. Participants who reported and perceived a greater degree of control over the outcome of their wish, however, were more likely to have their wish realized. Recreating holiday cheer and engaging in wishful thinking traditions may indicate the feasibility of future work in extending positive thinking among frontline healthcare workers.

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## Disclosure

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