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ORIGINAL ARTICLE

A prospective intervention to improve happiness and reduce burnout in oncologists

Mark Clemons[1,2] · Sasha Mazzarello[2,3] · Gregory Pond[2] · Eitan Amir[4] · Timothy Asmis[1,2] · Scott Berry[5] · Muriel Brackstone[6] · Stephanie Brule[1] · Rachel Goodwin[1] · John F. Hilton[1,2] · Miguel Julião[7] · Garth Nicholas[1] · David J. Stewart[1,2] · Paul Wheatley-Price[1,2] · Laurel Cholmsky[2] · Alison Krentel[8] · Brian Hutton[2,3] · Anil A. Joy[9]

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Abstract

Background There is a paucity of data about effective interventions to improve happiness and reduce burnout in oncologists. Benjamin Franklin developed a 13-week program of "necessary activities" or "virtues" (temperance, silence, order, resolution, frugality, industry, sincerity, justice, moderation, cleanliness, tranquility, chastity, and humility) to follow, in his attempt at self-improvement. In this pilot study, we explored whether using a modified version of this was associated with any discernable impact on physician happiness, burnout, or compliance with each of the virtues.

Methods Self-reported happiness (Oxford happiness scores) and burnout (Abbreviated Maslach Burnout Inventory) were completed at baseline (pre-study), week 13, and 1 month after completion of the program. Each day during the 13-week program, oncologists were emailed a list of virtues to focus on and scored how they felt they were complying with them. The oncologist's spouses also assessed how they felt the oncologist was complying with the virtues.

Results Thirteen physicians completed the baseline scores, 11 completed Maslach/Oxford scores at the end of the study, and 8 the 1-month post-study assessment. No significant improvements in happiness and burnout (emotional exhaustion, depersonalization, personal accomplishment) scores were observed. Statistically significant changes in self-rated virtue scores were observed for temperance ($p = 0.046$), order ($p = 0.049$), and resolution ($p = 0.014$). Additionally, although not reaching statistical significance, 11 of 13 virtues (excepting sincerity and chastity) assessed by spouses indicated a positive change over time.

Conclusion In this hypothesis generating study, daily reflection on personal virtues was not associated with any statistically significant change in happiness or burnout scores. Alternative strategies should be considered.

Keywords Longitudinal pilot study · Personal virtues · Self-care · Physician burnout

Introduction

Physicians are exposed to high levels of stress at work and are at risk of experiencing mental disorders, substance abuse, suicide, and work-related burnout [1–4]. Burnout among doctors can lead to anxiety, alcohol and drug misuse, increased medical errors, poorer health, premature retirement, and dysfunctional relationships both at home and at work [5–8]. Studies of oncologists reveal that burnout and job dissatisfaction are associated with many issues, including depression [9–11].

✉ Mark Clemons
mclemons@toh.ca

[1] Department of Medicine, Division of Medical Oncology, The Ottawa Hospital and University of Ottawa, 501 Smyth Road, Box 912, Ottawa, ON K1H 8L6, Canada

[2] Ottawa Hospital Research Institute and University of Ottawa, Ottawa, Canada

[3] Department of Epidemiology and Community Medicine, University of Ottawa, Ottawa, Canada

[4] Princess Margaret Cancer Centre, Toronto, Canada

[5] Sunnybrook Odette Cancer Centre, University of Toronto, Toronto, Canada

[6] London Regional Cancer Program, London, Canada

[7] Equipa Comunitária de Suporte em Cuidados Paliativos ACES Sintra, Sintra, Portugal

[8] Bruyere Research Institute, Ottawa, Canada

[9] Division of Medical Oncology, Department of Oncology, University of Alberta, Cross Cancer Institute, Edmonton, Canada

Despite this, it appears that while burnout is increasing, anecdotally at least, physicians rarely take proactive positive steps to improve either their home or work lives, with most only attempting corrective action during times of crisis.

Our group has previously attempted to provide some practical guidance on a broad range of topics impacting physician quality of life [12–15]. However, we were not aware of any practical, evidence-based, guidance for oncology health care professionals to improve their happiness and reduce burnout. We therefore decided to explore whether a tool developed over 200 years ago could be used as a practical strategy to drive these changes. This tool was developed by the American founding father, polymath, inventor, and scientist, Benjamin Franklin (1706–1790). His lifelong efforts at self-improvement culminated in a 13-week self-improvement and self-assessment plan [16]. The program was designed so that participants would focus on one "necessary activity" or "virtue" each week. Each subsequent week, an additional virtue was added. Participants' reflections were assessed by responding to a simple, "yes" or "no" question about how well they felt they had followed the virtue [16]. Franklin's "13 virtues" protocol has been discussed frequently and referenced by others in lay press and popular culture self-help articles, but without any systematic exploration of its actual effectiveness [17, 18].

We hypothesized that Franklin's 13 virtues protocol could help physicians caring for cancer patients be happier and reduce work-related burnout. We also explored whether any sustained improvement after completion of the 13-week program could be observed or whether physicians felt they were being compliant with these virtues. Finally, we assessed whether others (i.e., their spouses or significant others) could discern if any such positive changes had actually taken place.

Methods

A prospective, longitudinal self-response assessment of the Franklin 13 virtues protocol was administered to a group of oncologists.

Study population The study cohort consisted of a group of medical and surgical oncologists and a palliative care physician. The participants were all known to the study lead (MC) and were chosen to broadly represent physicians in a variety of stages of their careers. Physicians had to be willing to promptly answer the daily email they received asking how compliant they had been with each virtue during the 13 weeks of the study and to complete validated happiness and burnout scores at baseline, week 13 and 1 month later. They also required a spouse, or significant other (SO), to provide external validity to the study cohort. Spouses or SOs were made aware of the purpose of the project and how we wanted to see if the participants succeeded in their attempt to improve/practice all 13 virtues.

Intervention

As the original 13 virtues were written over 200 years ago [16], the protocol was modified to modernize or expand upon the interpretation of the "virtues." For the daily reflection on each virtue, a 5-point Likert scale was used instead of a simple yes/no to increase potential variability in responses. Some practical examples were also added to allow interpretation of each virtue in modern life (Table 1). In the original version, only one virtue per week was evaluated. In this modernized version, the previous weeks' virtues were reviewed in addition to the new virtue in an effort to try to enhance serial reflection on all virtues. In other words, the next virtue was added to the previously listed virtues (i.e., week 1: virtue 1; week 2: virtue 1 + 2; week 3: virtue 1 + 2 + 3 etc.) and scores were requested daily.

Study evaluations

Participants Prior to study commencement, each physician completed the validated instruments of personal happiness (Oxford Happiness Questionnaire, Appendix 1) [19] and burnout (Abbreviated Maslach Burnout Inventory, Appendix 2) [20]. These were measured at baseline, at study completion (i.e., at the end of week 13), and 1 month following study completion. For each of the virtues, the physician was sent an email at the end of each day, which requested the participant to evaluate themselves on a 5-point Likert scale on how well they lived up to the tenants of each virtue in the previous 24 h. Specifically, the physician was asked "Overall today I lived up to the tenants of the virtue (strongly disagree, disagree, neither agree nor disagree, agree or strongly agree)." Physicians were informed that there was no correct or incorrect answer and that the project was not a competition between study participants.

Spouses/significant others Spouses/significant others completed an assessment of how compliant they believed their partner was for each of the 13 virtues at baseline, at week 13, and 1 month after study completion. An online narrative questionnaire was also available for completion for the oncologists to describe their personal experience and for the spouses to describe their experiences as their partner participated in the study (Appendix 3).

All study evaluations were completed online using Google Forms which were administered and collected by the project manager. Physicians and spouses were blinded to each other's scores for the duration of the study.

Table 1 Franklin's original virtues, his interpretation and more modern examples

Week	Virtue	Franklin's interpretation	Current study's interpretation
1	Temperance	Eat not to dullness. Drink not to elevation.	Eat when hungry, stop before one is full No second helpings No junk food Only healthy snacking allowed No eating in front of TV Moderation in alcohol, nicotine, or other recreational drugs
2	Silence	Speak not but what may benefit others or yourself. Avoiding trifling conversation	No swearing No gossiping. Try not to say anything negative about anyone (in person, phone, email, internet etc.) Avoid quick reply—slow down and actually think before you act/speak Listen intently to what people are saying Turn off/do not use any electronic media in the car or at home
3	Order	Let all your things have their places. Let each part of your business have its time.	Decline tasks for which you have neither the energy nor time for stop trying to multitask—be present, do things one at a time Ensure that things are dealt within a specific set time and place Family time is family time, work time is work time. Do not confuse
4	Resolution	Resolve to perform what you ought. Perform without fail what you resolve	Let your yes be your yes. Your no be your no. Then stick to it. Resolve how you will act when faced with a challenge, *before* you are faced with it. Write down your top 3 goals of the day, review them and take action towards completing them on a daily basis
5	Frugality	Make no expense but to do good to others or yourself. Waste nothing.	Bring your lunch to work. Eat leftovers No unnecessary purchases—only basic necessities of life/living Use cash whenever possible (so you can be physically reminded of your spending) Try to take public transport or walk/bike as much as possible Get rid of things you no longer use or need Conserve energy and recycle as much as possible
6	Industry	Lose no time. Be always employed in something useful. Cut off all unnecessary actions.	Be on time (or early) for every appointment Focus on being efficient with your time (e.g., prepare in advance for clinics, appointments, projects) Use your free time wisely. Do not waste it on distractions. Substitute electronic media entertainment (e.g., TV, internet, movies) with going outside for a walk and/or exercise Do something of value for someone else every day (e.g., pick up and throw out trash wherever you see it)
7	Sincerity	Use no hurtful deceit. Think innocently and justly. Speak accordingly.	Do not lie. Be honest in all communication Keep private conversations private Err on the side of understanding. Give people the benefit of doubt. No sarcasm. Do not use the cloak of "honesty" as a way to deliver callous or cutting remarks. Before sharing information with anyone else ask—is it true? Is it kind? Is it necessary—if not all 3 then do not share
8	Justice	Wrong none by doing injuries, or omitting the benefits that are your duty.	Do the right thing In all deliberations, be fair Do not complain about your own perceived wrongdoings. If there is something that can or should be fixed, take steps to do so to make things right. Help others to do the same for themselves
9	Moderation	Avoid extremes. Forbear resenting injuries so much as you think they deserve.	Enjoy the things you already have and enjoy them fully Strive for balance in all areas of life "Delay your gratification" a little longer than what you perceive to be comfortable Slow down, appreciate and truly enjoy your senses Avoid polarizing thoughts or opinions; try to seek a middle ground. Let go of pain, injury, hurt from others—forgive more
10	Cleanliness	Tolerate no uncleanliness in body, clothes, or habitation	Wash your hands Keep yourself and your environment (home, office, car, yard, area, etc.) clean—but remember moderation and be wary of obsession If you make a mess, clean it up immediately—do not wait for later or for others to do so for you
11	Tranquility	Be not disturbed at trifles, or at accidents common or unavoidable	Do not be quick to anger Change your perspective—ask yourself can you actually change it/influence it. If you cannot, let it go. Try to see things objectively instead of emotionally. Be curious instead of being angry—learn something from the experience. Remember the learning. Try not to repeat the mistake. Let go of negative emotions/experiences. Do not harbor resentment. Try and take up a meditation/mindfulness practice

Table 1 (continued)

Week	Virtue	Franklin's interpretation	Current study's interpretation
12	Chastity	Rarely use venery but for health or offspring; never to dullness, weakness, or the injury of your own or another's peace or reputation	Try and refrain from all sexual activity (physical or virtual). No electronic/paper surrogates Focus one's sexuality instead on meaningful relationships rather than any physical act itself
13	Humility	Imitate Jesus and Socrates.	The absence of pride Do not boast, brag, or name-drop Help and mentor others without asking for credit Give or share with others opportunities offered to you Donate or give something away freely (e.g., money, time, assistance etc.) without expectation of return golden rule = do unto others, what you would have done unto you

Endpoints

The primary endpoint of the study was to assess whether completion of a 13-week program led to increased Oxford Happiness Questionnaire scores [19] and reduced scores on The Abbreviated Maslach Burnout Inventory. With the Oxford Happiness Questionnaire, the scores are interpreted as 1–2 (not happy), 2–3 (somewhat unhappy), 3–4: (not particularly happy or unhappy), 4 (somewhat happy or moderately happy) 4–5 (rather happy; pretty happy), 5–6 (very happy), and 6 (too happy). The average person scores 4. The Abbreviated Maslach Burnout Inventory consists of 3 domains; Emotional Exhaustion (high scores indicate greater emotional exhaustion and hence more burnout), Depersonalisation (high scores indicate greater depersonalisation and hence more burnout), and Personal Accomplishment (high scores indicate greater personal accomplishment and hence less burnout) [20].

The secondary endpoint consisted of whether or not there was any improvement in self-rated compliance with the virtues during these 13-week program.

Statistics

Maslach scores and Oxford happiness scores were summarized at baseline (pre-study), post-study, and 1 month after completion of study. The change from baseline was calculated. Positive values indicate an increase in score, whereas a negative value indicates a decrease in scores. Associations between different scores were assessed using Spearman rank correlation coefficients. Changes from pre-study to post-study for spousal assessment of virtues were performed using the Wilcoxon signed rank test. Since virtue scores were evaluated each week, a repeated measures regression analysis was performed to evaluate whether virtue scores changed over the course of this study. Positive values of the repeated measures estimate indicated an increase in scores across weeks. All reported p values were two-sided and a p value of 0.05 or less was deemed statistically significant. The sample size was chosen based on purposeful convenience sampling and was not formally derived, as there are no published estimates of anticipated effect.

Results

Fifteen physicians were approached and 13 agreed to participate in the study. The two who declined cited time constraints. Participants were medical oncologists (11), a surgical oncologist ($n = 1$), and a palliative care physician ($n = 1$); 10 were males and 3 were females, with a median age of 45 years (range 33–67 years). The median number of years in practice was 14 (range 1–38 years), and all had their primary practice based in academic cancer centers. The study took place between January 3 and April 5, 2017. Thirteen physicians completed the baseline scores, 11 completed Maslach/Oxford scores at the end of the study, and 8 at the 1-month post-study assessment. Eight physicians completed at least one virtue assessment each of the 13 weeks, while the other physicians completed at least one virtue assessment in 6, 8, 10, 11, and 12 weeks.

Happiness scores

Over the 13-week study period, the median (range) happiness scores were similar from baseline (4.2 [3.4 to 5.8]) to week 13 (4.7 [3.6 to 5.7]) and to 1 month after completion of the study (4.7 [4.3 to 5.7]) (Table 2). No statistically significant change in happiness was observed over the course of this study ($p = 0.11$), nor comparing the 1-month post-study evaluation with baseline ($p = 0.078$).

Burnout scores

Maslach scores were similar at the end of the study and at baseline (Table 2) and no significant change was noted for

emotional exhaustion ($p = 0.46$), depersonalization ($p = 0.88$), or personal accomplishment ($p = 0.72$). Similar results were observed when comparing baseline score to the 1-month post-study time points ($p = 0.88$, 0.31, 0.63, respectively).

Compliance with virtues Statistically significant changes in virtue scores were observed for temperance ($p = 0.046$), order ($p = 0.049$), and resolution ($p = 0.014$). These three virtues all had increasing scores over time, and of the 12 virtues assessed for multiple weeks, only chastity (which was only measured for 2 weeks) and moderation (which had an estimate of −0.004 and p value = 0.96) had declines over time. Summary statistics are provided in Table 3.

Spousal assessments

All 13 spouses completed the baseline questionnaires, 4 spouses completed questionnaire at week 13, and 5 completed the 1-month assessment. Only three spouses completed all questionnaires. Although not reaching statistical significance, 11 of 13 virtues (excepting sincerity and chastity) assessed by spouses indicated a positive trend towards an increase over time.

Associations between spousal and oncologist assessed virtues at week 13 are presented in Table 4. Interestingly, 9 of 13 virtues had no association or a negative association, indicating disagreement between how oncologists view their virtues and how their spouses view them. Additionally, the associations between the week 13 virtue score and the post-study Maslach/Oxford scores are presented in Table 4. The only statistically significant associations were between emotional exhaustion with depersonalization scores ($\rho = 0.82$, p value = 0.002), moderation ($\rho = -0.88$, $p = 0.021$), and Oxford happiness score ($\rho = -0.77$, $p = 0.005$). However, higher emotional exhaustion scores trended towards decreased virtue scores (except for industry and humility)—these trends did not attain statistical significance.

Are changes in happiness, burnout, and virtuous behaviors sustained?

Happiness and burnout scores reported at the end of study were strongly correlated with scores reported 1 month after study completion. Spearman ρ (p value) was 0.97 (< 0.001), 0.82 (0.013), 0.73 (0.039), and 0.95 (< 0.001) for associations between emotional exhaustion, depersonalization, accomplishment, and happiness scores at end of study and 1-month post-study.

Narrative statements

Physicians and spouses were able to add narrative comments on the daily virtue email and as part of a specific end of study narrative statement. A total of 12 micro-narratives were submitted from participants, in response to the question, "Please write about the most memorable experience you had participating in this 13-week study." Two participants wrote that they did not remember anything from the experience. The other 10 stories were positive reflections about participation and included some statements about how the study impacted them. The largest group of themes indicated that the study had a positive impact on participant behavior, exhibited by experiences such as remembering to say "no" to things when

Table 2 Summary statistics of happiness and Maslach Burnout Scores

Characteristic		Pre-study	Post-study	1 month post-study
Happiness				
Oxford Happiness Score Median (range)	Raw score	4.2 (3.4, 5.8)	4.7 (3.6, 5.7)	4.7 (4.3, 5.7)
	Change	-	0.3 (−0.3, 0.9)	0.4 (−0.1, 0.9)
Number (%) with increased scores (i.e., increased happiness)			7/11 (63.6)	5/8 (62.5)
Maslach Score				
Emotional exhaustion median (range)	Raw score	7 (0, 15)	7 (0, 14)	4.5 (2, 13)
	Change	-	-1 (−4, 7)	0 (−7, 6)
Number (%) with decreased scores (i.e., less emotional exhaustion)			7/11 (63.6)	3/8 (37.5)
Depersonalization Median (range)	Raw score	4 (0, 14)	3 (0, 11)	2 (0, 8)
	Change		0 (−6, 5)	-0.5 (−10, 2)
Number (%) with decreased scores (i.e., less depersonalization)			3/11 (27.3)	4/8 (50.0)
Personal accomplishment median (range)	Raw score	16 (12, 18)	16 (12, 17)	15.5 (12, 18)
	Change	-	0 (−3, 3)	-0.5 (−2, 2)
Number (%) with increased scores (i.e., greater personal accomplishment)			3/11 (27.3)	2/8 (25.0)

Table 3 Virtue summary statistics

Spouses score				
		Raw scores	Change	Signed rank *p* value
Temperance	Pre-study	3.3 (1.1)	0.4 (1.1)	0.50
	Post-study	3.1 (1.3)		
Silence	Pre-study	3.2 (1.3)	0.6 (1.4)	0.50
	Post-study	3.4 (1.3)		
Order	Pre-study	3.3 (1.1)	0.4 (1.0)	0.50
	Post-study	3.7 (1.5)		
Resolution	Pre-study	3.8 (0.9)	0.7 (1.1)	0.25
	Post-study	4.3 (1.0)		
Frugality	Pre-study	3.6 (1.1)	0.9 (0.7)	0.063
	Post-study	4.0 (1.0)		
Industry	Pre-study	3.3 (0.9)	0.6 (1.1)	0.50
	Post-study	3.9 (0.9)		
Sincerity	Pre-study	4.3 (0.8)	−0.3 (0.8)	0.63
	Post-study	3.7 (1.0)		
Justice	Pre-study	4.2 (0.8)	0.0 (1.0)	1.00
	Post-study	4.0 (0.8)		
Moderation	Pre-study	3.7 (0.8)	0.3 (0.5)	0.50
	Post-study	3.6 (0.5)		
Cleanliness	Pre-study	3.6 (0.7)	0.6 (1.0)	0.31
	Post-study	3.7 (0.8)		
Tranquility	Pre-study	3.4 (1.1)	0.4 (1.8)	1.00
	Post-study	3.7 (1.0)		
Chastity	Pre-study	3.5 (0.7)	−0.1 (0.9)	1.00
	Post-study	3.1 (1.2)		
Humility	Pre-study	3.9 (0.9)	0.3 (1.3)	1.00
	Post-study	4.0 (0.8)		

energy is low, cleaning up work desk, avoiding second helpings, taking an afternoon off to unwind, and setting goals to improve a marital relationship. The second set of experiences related to the conversations that arose from the study, illustrated by a discussion of virtues with a spouse and chatting with colleagues about wanting to do better at achieving the virtues.

Table 4 Spousal associations

Post-study					
	Emotional exhaustion	Depersonalization	Personal accomplishment	Oxford happiness score	Spouse assessment
Temperance	−0.70	−0.13	0.35	−0.17	−0.20
Silence	−0.44	−0.14	0.36	0.79	0.28
Order	−0.21	0.38	0.34	0.70	0.18
Resolution	−0.10	0.16	−0.34	0.10	0.00
Frugality	−0.56	−0.19	0.00	0.74	−0.80
Industry	0.24	0.00	−0.61	0.24	−0.23
Sincerity	−0.58	−0.38	−0.62	−0.58	−0.64
Justice	−0.72	−0.55	−0.42	−0.36	−0.69
Moderation	−0.88	0.00	0.00	0.29	−0.29
Cleanliness	−0.46	−0.48	−0.20	0.37	0.28
Tranquility	−0.62	−0.72	−0.41	−0.25	−0.70
Chastity	−0.70	−0.28	0.40	0.58	−0.04
Humility	0.24	0.00	−0.61	0.24	0.38
Emotional exhaustion					
Depersonalization	0.82				
Personal accomplishment	−0.45	−0.57			
Oxford Happiness Score	−0.77	−0.55	0.51		

The last set of experiences can be classified as relating to the difficulty of maintaining this exercise throughout a busy schedule and sometimes they were unreasonable, e.g., chastity, life got in the way of the virtues, and enthusiasm at the beginning that waned with time. Of the 12 stories submitted, 3 people said that they were unlikely to adapt the 13-week virtues into their lives now that the study was over, with 9 people saying that they would be likely to continue working on these areas in their lives, with one individual writing, "I'll try not to slip."

Discussion

As in all areas of health care, there is increasing interest in strategies to improve happiness and reduce burnout. These issues are not unique to either physicians or the field of oncology as we are all faced with the challenges of multiple stressors within our work and home lives. Research shows that individuals respond to work/life stresses in unproductive ways, such as by engaging in emotional withdrawal, social isolation, and by denying the existence of a problem [21]. It remains a challenge to identify those experiencing burnout early (and hopefully before it happens) and to develop intervention strategies. Benjamin Franklin designed the 13 virtues program, using virtues that he deemed to be either necessary or desirable. For this reason, we hypothesized that, "self-improvement" by focusing on these virtues might increase self-satisfaction and overall happiness in individuals experiencing the challenges of potential work-related burnout.

It is interesting to observe that despite Franklin's multitude of talents, he found the task "of more difficulty than I had imagined" [22]. Yet, the process of following these virtues was one that made him "a better and a happier man than [he] otherwise should have been if [he] had not attempted it [16]." Perhaps therefore we should not be surprised that in the current study where we asked oncologists to self-reflect on common virtues over a 13-week period did not lead to improved happiness and reduced burnout. While reflecting upon personal virtues on a daily basis was associated with an increase in physician compliance to following some of these virtues, this reflection did not, however, impact physician assessment of either their happiness or burnout.

One question that was raised during this study was whether or not oncologists were "happier" or had more "burnout" than other groups of physicians. It is challenging to assess how oncologists rate relative to other physicians as the different studies use different methodologies in different. So, while the baseline median Oxford Happiness Scale score of 4.2 would suggest that oncologists "Somewhat happy or moderately happy" the range of values from 3.4 to 5.8 would reflect "Not particularly happy or unhappy" to "Very happy". Similarly, the self-reported burnout scores have been measured in physicians in different countries, specialities, or sectors (i.e., public/private or rural/urban) [21]. One study comparing burnout between specialties reported the highest prevalence of burnout in urology (63.6%), physical medicine and rehabilitation (63.3%), family medicine (63.0%), radiology (61.4%), orthopedic surgery (59.6%), dermatology (56.5%), general surgery subspecialties (52.7%), pathology (52.5%), and general pediatrics (46.3%) [23].

In the current study, we observed that there was no significant change in Maslach scores at the end of the study as compared to baseline. For the emotional exhaustion component (where higher scores are associated with tiredness, somatic symptoms, decreased emotional resources and a feeling that one has nothing left to give to others), the median score was 7 (range 0, 15). Unfortunately, due to differences in how these scores are evaluated, cross study comparisons are challenging. For example, other studies have shown a median score of 21 among US physicians, and a range of 21–25 among emergency (ER) physicians [24, 25]. For depersonalization (where higher scores are associated with negative, cynical attitudes, and impersonal feelings towards patients), the median score was 4 (range 0–14). In other studies, with the caveat noted above, the median score was with 5 among US physicians and ranged from 8.7 to 20.7 among ER physicians. Finally, for reduced personal accomplishment (feelings of incompetence, inefficiency, and inadequacy), the median score was 16 (range 12–18) suggesting that oncologists have high levels of personal accomplishment. The higher the Emotional Exhaustion and Depersonalisation scores, and the lower the Personal Accomplishment scores, the more the physician could be suffering from burnout [9].

Clearly, this small study has limitations. A challenge of such a small sample size is that some of the data may appear erroneous, simply due to statistical oddities when evaluating multiple endpoints in a limited sample size. For example, when evaluating the emotional exhaustion score, the median pre-emotional exhaustion score is 7, the median post-emotional exhaustion score is 7, but the median change is − 1. The study deliberately included physicians involved in different aspects of cancer care including medical oncologists, a surgical oncologist, and a palliative care physician. The limited number of non-medical oncologists could be viewed as both a limitation and a positive aspect of the study. However, future studies should involve more participants. Perhaps, it was unrealistic to think that a 200-year-old program, and our "translation" of Franklin's original text, could lead to improvements in happiness and reduced burnout in physicians caring for cancer patients. The authors attempted to make his original virtues more relevant to modern life. For example, Franklin's virtue of

"Chastity" states, "Rarely use venery but for health or offspring, never to dullness, weakness, or the injury of your own or another's peace or reputation". We possibly, and rather naively, changed this to, "Try and refrain from all sexual activity (physical or virtual). No electronic/paper surrogates. Focus one's sexuality instead on meaningful relationships rather than any physical act itself." Perhaps we would have been better to say, "Physicians (and all others) should be encouraged to engage in as much loving and consensual sexual activity as is desired by both partners, as frequently as desired".

Clearly, evaluating the endpoints chosen in this study is challenging, as being, "happy" has more benefits than just feeling good, and could be correlated with other potential benefits on for example, health, better marriages, and attaining goals. Neither burnout as a phenomenon nor the prevention or intervention strategies can be investigated in isolation. Even if the study failed to show any statistically significant benefits, it could be that the new virtue and regular encouragement towards self-improvement may have been welcomed by the participants. These seemed to be positively reflected by both oncologists and their spouses in the narratives section (Appendix 3). However, is it possible that these daily reflections may be associated with decreased happiness in some individuals? It is recognized that individuals who set extremely, and potentially unrealistically, high goals (i.e., self-oriented perfectionists) have increased rates of depression [26, 27]. It is possible that for these individuals, these reflections were a daily reminder that they were not virtuous enough, decreasing their overall happiness. For these individuals, focusing virtues may be harmful. This again provides an interesting angle for future studies.

Conclusion

We need to find strategies to improve the quality of life at home and work [28]. While Franklin never attained perfection, he felt better and happier from having attempted it. So while his virtues model did not lead to improved happiness or reduced burnout in the current hypothesis-generating study, it is essential that we work towards creating a positive work environment that fosters work—life balance and job satisfaction, while focusing on strategies to prevent burnout.

Compliance with ethical standards

Conflict of interest None of the authors declare any financial conflicts of interest.

We have full control of all primary data and we agree to allow the journal to review the data if requested.

Appendix 1. Scoring the Oxford Happiness Questionnaire [19]

Calculate your score

Step 1. Items marked (R) should be scored in reverse:

For example, if you gave yourself a "1," cross it out and change it to a "6."

Change "2" to a "5"

Change "3" to a "4"

Change "4" to a "3"

Change "5" to a "2"

Change "6" to a "1"

Step 2. Add the numbers for all 29 questions. (Use the converted numbers for the 12 items that are reverse scored.)

Step 3. Divide by 29. So your happiness score = the total (from step 2) divided by 29.

Your Happiness Score:

Interpreting the score, by Stephen Wright

1–2: Not happy. If you answered honestly and got a very low score, you are probably seeing yourself and your situation as worse than it really is. I recommend taking the Depression Symptoms test (CES-D Questionnaire) at the University of Pennsylvania's "Authentic Happiness" Testing Center. You'll have to register, but this is beneficial because there are a lot of good tests there and you can re-take them later and compare your scores.

2–3: Somewhat unhappy. Try some of the exercises on this site like the Gratitude Journal & Gratitude Lists, or the Gratitude Visit; or take a look at the "Authentic Happiness" site mentioned immediately above.

Oxford Happiness Questionnaire 3

3–4: Not particularly happy or unhappy. A score of 3.5 would be an exact numerical average of happy and unhappy responses. Some of the exercises mentioned just above have been tested in scientific studies.

and have been shown to make people lastingly happier.

4: Somewhat happy or moderately happy. Satisfied. This is what the average person scores.

4–5: Rather happy; pretty happy. Check other score ranges for some of my suggestions.

5–6: Very happy. Being happy has more benefits than just feeling good. It is correlated with benefits like health, better marriages, and attaining your goals. Check back—I'll be writing a post about this topic soon.

6: Too happy. Yes, you read that right. Recent research seems to show that there's an optimal level of happiness for things like doing well at work or school, or for being healthy, and that being "too happy" may be associated with lower levels of such things.

Appendix 2. Scoring the Abbreviated Maslach Inventory [20]

	Every day	*A few times a week*	*Once a week*	*A few times a month*	*Once a month or less*	*A few times a year*	*Never*	TOTAL
I deal very effectively with the problems of my patients	6	5	4	3	2	1	0	
I feel I treat some patients as if they were impersonal objects	6	5	4	3	2	1	0	
I feel emotionally drained from my work	6	5	4	3	2	1	0	
I feel fatigued when I get up in the morning and have to face another day on the job	6	5	4	3	2	1	0	
I've become more callous towards people since I took this job	6	5	4	3	2	1	0	
I feel I'm positively influencing other people's lives through my work	6	5	4	3	2	1	0	
Working with people all day is really a strain for me	6	5	4	3	2	1	0	
I don't really care what happens to some patients	6	5	4	3	2	1	0	
I feel exhilarated after working closely with my patients	6	5	4	3	2	1	0	

Red = Emotional Exhaustion
Total: _____ (0-18)
Higher scores indicate greater emotional exhaustion, and greater burnout.

Blue = Depersonalization
Total: _____ (0-18)
Higher scores indicate greater depersonalization, and greater burnout.

Green = Personal Accomplishment
Total: _____ (0-18)
Higher scores indicate greater personal accomplishment, and *less* burnout.

Appendix 3. Narrative survey for all participants

1. Please write about the most memorable experience you had participating in this 13-week study?
2. Follow-up questions to the story include:
   a. How did you feel when you remember this story?
   b. Who was the most important person in your story?
   c. Where did your story happen?
   d. Do you think this story represents an event that is: very common, somewhat common, rare
3. How likely are you to adapt the 13-week virtues into your life now that the study is over?
4. How did you feel participating in the study?

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