

# WRITING ACCOUNTABILITY GROUPS ARE A TOOL FOR ACADEMIC SUCCESS: THE OBESITY HEALTH DISPARITIES PRIDE PROGRAM

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**Introduction:** The current hypercompetitive extramural funding environment in the United States emphasizes the critical need for effective research training programs that focus not only on grantsmanship, but on skill development across the full range of research activities, culminating in writing research results for publication. Using Writing Accountability Groups (WAG), the National Heart, Lung, and Blood Institute (NHLBI) funded Obesity Health Disparities (OHD) PRIDE is one of the few research training and mentoring programs that places an equal focus on scientific writing and grant writing. This article reports on the utility of WAGs for OHD PRIDE mentees.

**Method:** Participants included 14 of 26 individuals who were fellows in the OHD PRIDE research training and mentoring program. A typical WAG has between four and eight members who meet for one hour each week over a 10-week period and commit a priori to attend at least 70% of the sessions. Summary statistics were produced to characterize number of peer-reviewed publications, grants, years in academic rank, and category of current academic rank, barriers to frequency of writing, and duration of writing. Results from pre- and post-WAG surveys were compared to determine the overall impact of the WAG. The study period discussed in this article took place between January and December 2017 and included data from three 10-week cycles beginning in February, May, and September.

**Results:** Fifty-three percent of OHD PRIDE participants successfully completed at least one 10-week WAG cycle. The WAGs did not have a statistically significant impact on either the frequency of writing or the duration of writing. However, the majority of the participants who successfully completed at least one WAG cycle reported that they

## INTRODUCTION

Innovative and expanded strategies to address the disproportionately low funding rates of R01s among certain United States (US) racial and ethnic populations are needed to capture untapped talent and increase the contribution of groups presently underrepresented in biomedical research workforce.<sup>1-3</sup> A significant funding gap between African American (AA) and White

researchers in first-time NIH R01 applications was documented by Ginther and colleagues at the end of the last decade.<sup>4,5</sup> More recently, a Working Group from the National Institutes of Health (NIH) reported that the funding gap during FY2000 and FY 2006 between first-time NIH R01 applications from African American and White researchers (17% vs 29%) continued between FY 2011 and FY 2015 (11% vs 17%).<sup>6</sup> The Work-

either maintained or increased their frequency or duration of writing.

**Conclusion:** By providing a structured approach to developing and/or enhancing a practice of consistent writing, time management skills, and collaborative relationships, the WAG has promise for enhancing scientific writing skills for many trainees and early-career faculty. Longer term follow-up is needed to more fully assess the potential impact of WAGs. *Ethn Dis.* 2020;30(2):295-304; doi:10.18865/ed.30.2.295

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ing Group also found that African American investigators: submitted fewer initial R01 grant applications; received lower overall priority scores; resubmitted unfunded grant applications less frequently; and proposed topics that were less likely to be awarded more often than White investigators.<sup>6</sup> These factors constitute critical barriers to reducing the racial disparity in funded initial R01 grant applications and in bringing the insights and talents of African American

Centers for Minority Aging Research<sup>11</sup>; the investigator development cores of the National Institute on Minority Health and Health Disparities (NIMHD) Specialized Centers of Excellence on Minority Health and Health Disparities; and the National Mentoring Network Grant programs.<sup>12</sup> These research skill-building programs are promising exemplars designed to increase the prevalence of underrepresented minority (URM) researchers in the biomedical workforce through diversity-focused training.

The current hypercompetitive environment for extramural funding in the United States further undergirds the critical need for effective research training programs that focus not only on grantsmanship, but also on skill development across the full range of research activities, culminating in writing research results for publication. Remarkably, few research training programs for early career researchers focus on both manuscript and grant writing.<sup>13</sup> This is particularly surprising given the increased focus on two key review criteria for NIH grant applications: a) the investigator's suitability, experience, training, and record of accomplishment; and b) the strength of publications or research products that punctuate the contributions to science required in the NIH biosketch. These are key areas of NIH grant applications where African American and other underrepresented minority applicants often do not fare well in peer review meetings to score grant applications.<sup>3,5,14</sup>

Writing and publishing peer-

reviewed manuscripts is one of the primary challenges facing URM faculty at both research-intensive and teaching-intensive institutions.<sup>7</sup> The development of strong writing skills and related habits is often assumed to be part of graduate research training; however, graduate students from groups underrepresented in the biomedical sciences tend to have fewer opportunities to develop scientific communication skills for careers in research compared with their peers from majority populations.<sup>4</sup> Those who transition to their first faculty position in a teaching-intensive institution without completing a post-doctoral research fellowship or publishing from it typically require additional training to establish research careers, and even many URM fellows at research-intensive institutions have had fewer opportunities to participate in high-quality research projects and to publish than their majority-group peers.<sup>3</sup> A high publication rate is essential for career advancement in academic research, and both publications and external grant applications are becoming increasingly important for promotion and tenure in teaching-intensive institutions. Early-career faculty and young scholars (ie, postdoctoral fellows) transitioning into a research career must develop effective ways to meet institutional and professional standards for writing productivity, but these requirements can be particularly challenging for faculty at teaching-intensive institutions because of high teaching loads, heavy service demands, and constrained resources

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researchers to bear on health challenges that affect the US population.

In an effort to increase the competitiveness of investigators underrepresented in the biomedical sciences and reduce the racial/ethnic funding gap in R01s, the NIH has established a number of training programs focused on developing strong grantsmanship skills, including, but not limited to, the National Heart, Lung, and Blood Institute (NHLBI) Programs to Increase Diversity among Individuals Engaged in Health-Related Research (PRIDE)<sup>7-10</sup>; Resource

for faculty research development.<sup>7</sup>

Obesity Health Disparities (OHD) PRIDE is an intensive research training and mentoring program funded by NHLBI, designed to support research-oriented early-career URM faculty at historically Black colleges and universities (HBCUs) and other teaching-intensive institutions in their effort to become established as independent biomedical scientists.<sup>7,8</sup> It is focused on developing mentees' strong scientific writing skills, promoting their strategic writing in advance of applying for grants, and enhancing the scholarly productivity of faculty with heavy teaching and clinical loads.<sup>7</sup> Because there is a paucity of published evidence-based strategies to establish scientific writing habits among early-career faculty from groups underrepresented in biomedical science, OHD PRIDE has also sought to evaluate the impact of its activities in this area.

One core component of OHD PRIDE's program is the *Writing Accountability Group* (WAG). The concept of WAGs was developed by Dr. Paul Silva, who advocated committing to a set schedule of writing with others to whom one would be accountable.<sup>15</sup> Johns Hopkins University (JHU) School of Medicine's Office of Faculty of Development has established several WAGs across the University to develop sustained scholarly writing habits. The first author has experience leading WAGs at the JHU School of Public Health and establishing WAGs at other universities. The purpose of this article is to report on the assessment of OHD

PRIDE's WAGs and their impact on mentees. We hypothesized that participation in WAGs would result in OHD PRIDE mentees spending increased time writing scientific manuscripts and an increase in their frequency of writing generally.

## METHODS

### Study Participants

Study participants included individuals who participated in the OHD PRIDE research training and mentoring program designed for early-career faculty from backgrounds underrepresented in biomedical research and who are graduates of or active faculty members at HBCUs. OHD PRIDE is one of nine PRIDE Programs at that time sponsored by the NHLBI.<sup>9</sup> Each PRIDE site addresses one of NHLBI's areas of emphasis (<https://www.nhlbi.nih.gov/node-general/programs-increase-diversity-among-individuals-engaged-health-related-research-pride>). OHD PRIDE focuses on training and preparing early-career faculty mentees to conduct disparities research in obesity. Individuals selected for this program are exposed to cutting-edge obesity research in combination with guidance in career navigation, networking, and intense one-on-one and group mentoring designed to enhance their overall research productivity with peer-reviewed publications, development of high-quality grant applications, and general professional development. Additional information on OHD PRIDE is available elsewhere.<sup>8</sup>

### Design

WAGs are peer-facilitated, weekly writing groups designed to instill good writing habits and incorporate time management, prioritization, and organization skills.<sup>15,16</sup> One unique aspect of a WAG is that it focuses on the writing process, rather than writing outcomes. There is no review of writing content. A typical WAG has between four and eight members who meet for one hour a week over a 10-week period and commit a priori to attend at least 70% of the sessions. Weekly WAGs allocate the first 15 minutes for members to report on their writing goal for the prior week and their plan for that day's writing session; the next 30 minutes are dedicated to a timed period of simultaneous, individual writing, and the final 15 minutes are allotted to participants reporting their accomplishments during the group writing session and writing goals for the upcoming week. In addition to the weekly WAG, Silva suggests that WAG participants write for at least 30 minutes 5 days a week.<sup>15</sup> The study period discussed in this article spanned from January to December 2017 and included data from three 10-week cycles beginning in February, May, and September. The Johns Hopkins Bloomberg School of Public Health institutional review board approved this research (IRB #7630).

### Measures

Participants completed brief electronically administered surveys prior to and after each WAG cycle. The pre-WAG questionnaire consisted of questions pertaining

to the participants' frequency of writing, ideal frequency of writing, duration of a typical writing session, and duration of an ideal writing session. This survey also asked participants to report: their number of peer-reviewed publications; the number of peer-reviewed publications they aspired to publish in the coming year; the number of grants on which they were the principal investigator; the number of grants they aspired to obtain as principal investigator; their faculty rank; and their time in that rank. Participants were also asked to assess the significance for them of common barriers to writing, which included: trouble getting started; perfectionism prevents me from finishing; too many clinical commitments; too many teaching commitments; too many personal/family commitments; difficulty with time management; do not have adequate statistical support; do not have mentors to give me feedback and encourage me; not very interested in my topic; do not know what to write about; English is not my first language; writing skills are poor; or other.

The final item asked participants to identify the most significant barrier of those they reported facing.

The post-WAG questionnaire was significantly shorter as it included only questions regarding the participants' frequency of writing, ideal frequency of writing, duration of writing, and ideal duration of writing. The pre-WAG and post-WAG Questionnaire can be obtained from the corresponding author.

### Approach

This study employed a pre-post study design with a non-random sample. After providing oral consent, participants were emailed a link to the pre-WAG questionnaire to ascertain their writing habits at the study's inception. Following the 10-week WAG, participants completed the post-questionnaire, which queried their writing habits in terms of frequency and duration of writing. Means and standard deviations were used to summarize the respondents' actual numbers of peer-reviewed publications, ideal number of peer-reviewed publications, the actual number of grants

where the participants were the principal investigator, and participants' ideal number of grants to obtain as principal investigator. Proportions were used to characterize the participants' current rank and reported barriers to writing, including the reported biggest barrier to writing. The Wilcoxon signed rank sum test was used to determine the overall impact of the frequency of writing and the duration of writing for members who completed pre- and post-WAG surveys.<sup>17</sup> P-values <.05 were considered to be statistically significant. Analyses were conducted using STATA version 14 (Stata-Corp, LLC., College Station, TX).

## RESULTS

The distribution of select characteristics of the WAG participants is presented in Table 1. Among the total group of 26 OHD PRIDE mentees, 53.8% of the program's participants took part in the WAGs. More than half of the study participants were assistant professors and their mean number of years at

**Table 1. Distribution of select characteristics of OHD PRIDE Writing Accountability Group (WAG) participants between February 2017 and January 2018<sup>a</sup>**

Question	Mean ± SD
Number of peer-reviewed publications	4.1 ± 3.7
Number of peer-reviewed publications aspired to publish	8.7 ± 5.4
Number of grants had as a PI	1.4 ± 1.1
Number of grants aspired to obtain as a PI	2.8 ± 1.9
Number of years in this rank	2.5 ± 2.4
Current rank	%
Associate professor	20
Assistant professor	60
Instructor	20

a. 14 early-career faculty participated in WAGs. One participant joined two groups, resulting in 15 responses.

**Table 2. Frequency of barriers to writing and the biggest barrier to writing among OHD PRIDE Writing Accountability Group participants between February 2017 and January 2018, N=14**

<b>Barriers to writing<sup>a</sup></b>	<b>n</b>	<b>%</b>
Have trouble getting started	10	20.8
Have too many teaching commitments	9	18.8
Perfectionism prevents me from finishing	6	12.5
Have too many personal/family commitments	6	12.5
Have difficulty with time management	5	10.4
Don't have adequate statistical/data analytic support	4	8.3
Other <sup>b</sup>	3	6.3
Have too many clinical commitments	2	4.2
Don't know what to write about	2	4.2
Writing skills are poor	1	2.1
Don't have anyone (mentors) to give me feedback	-	-
<b>Biggest barrier to writing<sup>a</sup></b>	<b>n</b>	<b>%</b>
Trouble getting started	3	20.0
Perfectionism prevents from finishing	2	13.3
Have too many teaching commitments	2	13.3
Have difficulty with time management	2	13.3
Don't have adequate statistical/data analytic support	2	13.3
Other barrier not specified	1	6.7
Have too many clinical commitments	1	6.7
Have too many personal/family commitments	1	6.7
Don't have anyone (mentors) to give me feedback	1	6.7
Don't know what to write about	1	6.7

a. Total exceeds 14 as some respondents reported more than one barrier and one person participated in two writing groups.

b. Other responses include: 1) procrastinator and doing too much; 2) making it a daily routine; 3) It is disheartening to know that in my professional environment, research is not a priority. It's very discouraging and dismal. Years before, I was in an environment where scientific inquiry was encouraged. I felt motivated. I do understand that I have to be autonomous and self-motivated, however.

their current rank was 2.5. Over the course of three WAG cycles, 14 participants completed at least 70% of all WAG sessions during a given 10-week period. There are 15 responses in our sample because one person completed two WAG sessions. Study participants reported having published an average of four peer-reviewed articles at baseline, but also reported that they aspired to have published an average of eight peer-reviewed articles at this point in their career. The participants reported being funded for an average of one grant as principal investigator. However, study members also reported that

they aspired to obtain an average of three grants as principal investigator by this point in their career.

The frequency of reported barriers to writing and the most significant barrier to writing are displayed in rank order in Table 2. The five most common barriers to writing included: 1) trouble getting started; 2) too many teaching commitments; 3) perfectionism prevents me from finishing; 4) have too many personal/family commitments; and 5) difficulty with time management. Four of the five most significant barriers to writing mirrored the most common barriers to writing. While it was not one of the

top five barriers, several respondents indicated that lack of adequate statistical/data analytic support was their biggest barrier to writing.

The participants' frequency and duration of writing are displayed in Table 3. Based on the Wilcoxon signed rank test, the WAGs did not have a statistically significant impact on the frequency of writing for the participants ( $P=.0915$ ). However, a fuller description of the findings is noteworthy. Specifically, 60% of the participants reported no change in their frequency of writing with the majority of these participants reporting writing almost every day before and after the WAG.

**Table 3. The impact of frequency and duration of writing for OHD PRIDE participants between February 2017 and January 2018<sup>a</sup>**

Frequency of Writing			Duration of Writing		
Pre	Post	Impact <sup>b,c</sup>	Pre	Post	Impact <sup>b,d</sup>
Rarely	Rarely	No change	16-30 minutes	0-15 minutes	Decrease
Rarely	Once a week	Increase	0-15 minutes	31-45 minutes	Increase
Once a month	Almost every day	Increase	16-30 minutes	16-30 minutes	No change
Twice a month	Once a week	Increase	2+ hours	16-30 minutes	Decrease
Once a week	Once a week	No change	2+ hours	2+ hours	No change
Once a week	Almost every day	Increase	31-45 minutes	16-30 minutes	Decrease
Once a week	Once a week	No change	1-2 hours	1-2 hours	No change
Almost every day	Every day	Increase	1-2 hours	2+ hours	Increase
Almost every day	Almost every day	No change	16-30 minutes	31-45 minutes	Increase
Almost every day	Almost every day	No change	46-60 minutes	2+ hours	Increase
Almost every day	Almost every day	No change	16-30 minutes	16-30 minutes	No change
Almost every day	Almost every day	No change	16-30 minutes	46-60 minutes	Increase
Almost every day	Almost every day	No change	16-30 minutes	16-30 minutes	No change
Almost every day	Almost every day	No change	16-30 minutes	16-30 minutes	No change
Every day	Almost every day	Decrease	46-60 minutes	1-2 hours	Increase

a. N=15; one person participated in two writing groups.

b. Impact denotes that the participants reported either a Decrease, Increase, or No change.

c. The percentages for each category of impact for frequency of writing includes: 60.0% for No change, 33.3% for Increase, and 6.7% for Decrease.

d. The percentages for each category of impact for duration of writing includes: 40.0% for No change, 40.0% for Increase, and 20.0% for Decrease.

Approximately one-third (33.3%) of the participants reported an increase in their frequency of writing. Several of the participants who reported writing rarely or occasionally increased the frequency of their writing sessions by more than one category (eg, rarely to once a week or once a month to almost every day). There were 6.7% of the participants who reported a decrease in their frequency of writing. For example, only one participant reported a decrease in their frequency of writing, decreasing from every day to almost every day.

Akin to the results of the frequency of writing, the Wilcoxon signed rank test revealed that the WAGs did not have a statistically significant impact on the duration of writing ( $P=.3277$ ) for the participants. Yet, there was variation in the

duration of participants' individual writing sessions. As displayed in Table 3, 40% of study participants reported no difference in the time they spent in each writing session, while 20% of respondents indicated a decrease in the duration of their writing sessions after a WAG cycle. Those with shorter writing sessions after a WAG cycle tended to report going *down* one category (eg, from 31-45 to 16-30 minutes). The remaining proportion of study participants (40%) reported longer writing sessions, with the additional time ranging from 15 to more than 60 minutes.

## DISCUSSION

There is a growing body of literature on strategies to increase re-

search productivity among academicians, particularly the frequency of writing and number of manuscripts submitted to peer-reviewed journals.<sup>18,19</sup> The inability to write efficiently and effectively, and inadequate training in scientific writing can impede career progression.<sup>20</sup> The objective of our study was to determine the impact of WAGs on the duration and frequency of writing for OHD PRIDE mentees. The findings related to the impact of the OHD PRIDE WAG on the frequency of writing and the duration of writing are not statistically significant. However, they are important for future research training and mentoring efforts going forward and are noteworthy. The majority of the OHD PRIDE WAG participants who successfully completed at least one WAG cycle either main-

tained or increased their duration or frequency of writing. For many of the participants, their frequency or duration of scientific writing did not change; however, these participants reported that they were already writing for almost every day and for at least 30 minutes per session. Some of the participants who initially reported that they were infrequent writers (eg, rarely, once a month, or twice a month) reported an increase in frequency of writing and reported the same or longer duration of writing. For example, one infrequent writer increased their frequency of writing from rarely to once a week and increased their duration of writing from zero to 15 minutes to 31 to 45 minutes; another infrequent writer increased their frequency of writing from once a month to almost every day while maintaining their duration of writing at 16-30 minutes. These findings provide a glimpse of the potential benefits of WAG participation and subsequent research productivity.

Early-career faculty members' readiness for independent research is largely reflected in their publication records, which in turn depend on their academic preparation and experience in scientific writing, data analysis, research collaboration, and communication skills. The gap between young URM faculty members' graduate training in scientific writing and related opportunities to publish, and those of other early-career faculty is evident in the publications they claim in their respective grant applications. Of the early-career researchers who applied for NIH funding between FY2000

and FY 2006, African American applicants had a lower percentage of last-authored papers compared with White, Asian, and Hispanic applicants.<sup>4</sup> African American applicants (mean of 40 citations) had significantly fewer citations than White (mean of 78 citations), Hispanic (mean of 90 citations), or Asian (mean of 143 citations) R01 applicants.<sup>4</sup> Similarly, African American physicians who applied for R01 awards between FY 2000 and FY 2006 had the lowest citation counts compared with applicants

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from other racial/ethnic groups.<sup>4</sup> Among R01 applicants between FY 2000 and FY 2006, African American physicians employed at institutions other than medical schools had the lowest number of published articles (mean of 9.5 articles) compared with White (mean of 20.7 articles) and Hispanic (mean of 29.6 articles) R01 applicants.<sup>5</sup> Based on these figures alone, African American researchers in general, are at a competitive disadvantage for receiv-

ing NIH funding.<sup>4,5,21</sup> This observation underscores the importance of URM graduate students, post-doctoral fellows, and early-career faculty increasing the duration and frequency of writing to, in turn, increase the number of peer-reviewed articles that can document their qualifications for the grant opportunities for which they plan to apply. The outcome of the OHD PRIDE WAGs demonstrates the potential of this approach for establishing writing habits that can enhance scholarly productivity, particularly among underrepresented minority faculty at teaching-intensive institutions.

The number and quality of peer-reviewed publications are traditional NIH metrics of success for research training and mentoring programs, as well as for the awarding of most extramural funding.<sup>7,21</sup> Yet, many URM faculty face several challenges that impede their writing, including but not limited to a lower likelihood of post-doctoral research training and going directly to a teaching position.<sup>22</sup> OHD PRIDE mentees identified the five biggest barriers to writing as trouble getting started, too many teaching commitments, perfectionism that prevents them from finishing, too many personal/family commitments, and difficulty with time management. With the exception of having too many teaching commitments, the remaining four biggest barriers to engaging in regular scientific writing can be mitigated by participating in a WAG. This is largely due to the structure and purpose of the WAG. Key features of the WAG include creating dedicated time and a

supportive environment in which to write, a great place to build scientific writing efficacy, a sense of community, improving time management skills, and fostering collaborative relationships.<sup>23,24</sup> Having a supportive environment in which to grow and develop confidence and additional skills is particularly critical since many URM faculty suffer from stereotype threat and/or imposter syndrome.<sup>23-27</sup> Because the WAG does not allow for the critique of each other's work, participants face substantially less risk of perfectionism impeding their progress. Negotiating, if not removing, these barriers to writing has the potential to increase participants' writing productivity.

Our study suggests that WAGs may be an effective tool for establishing sound writing habits and enhancing productivity; however, there are some limitations worth noting. Because we were able to hold WAGs at only a limited number of time periods each semester, only a subset of OHD PRIDE mentees were able to participate and provide their data. As such, our results may have limited generalizability. It is also important to note that our data were self-reported and participants likely overestimated writing practices. The likelihood of such an overestimate is evidenced by the cohort's unrealistic aspiration to have already published eight papers while having published an average of 4 papers at baseline.

The evaluation of these WAGs focuses on the initial post-WAG assessment and is unable to determine whether the WAG has a long-

term sustainable impact. In addition, the number of participants in this study was small but the results were in the expected directions. Training programs such as OHD PRIDE have a cohort size that is common among National Research Service Award training programs.

By contrast our study had several strengths, including the assessment of a rigorous and structured approach to improve writing habits and a focus on URM in teaching intensive institutions, a group at greatest risk of not receiving NIH funding. WAGs are easy to implement and to scale at negligible cost.

An ongoing focus of OHD PRIDE is to help URM faculty in teaching-intensive universities learn to navigate and overcome the barriers to research productivity. WAG participants from teaching-intensive institutions listed too many teaching commitments as one of the biggest barriers to writing, even when publishing peer-reviewed manuscripts was a critical part of their tenure and promotion process. One strategy developed in OHD PRIDE to address this challenge is aimed at maximizing faculty members' writing at times when they have the fewest other academic responsibilities that would impede their writing efforts, such as during scheduled vacations and semester breaks.

In scheduling OHD PRIDE's WAGs, the first author developed an academic calendar-based writing plan for URM faculty at teaching-intensive institutions—the Academic Break Cycle (ABC) plan.<sup>7,21</sup> An example of the ABC writing plan would be for faculty members to fo-

cus specifically on writing one or more papers over the summer with the goal of submitting them before having to resume teaching classes in the fall. Throughout the fall semester, they should work on another paper with the goal of submitting it by the end of classes. During the fall semester, faculty members should also receive a decision on the papers that were submitted during the summer. Necessary revisions should be addressed over the Thanksgiving and/or holiday break, with the goal of resubmitting these papers before the spring semester begins. During the spring semester, faculty members should begin to draft another paper, address any revisions to previously submitted manuscripts, and begin to organize the papers that they want to write for the following summer. Implicit in the ABC plan is writing on a consistent basis and prioritizing writing over other activities—both outcomes of a WAG. Some of the OHD PRIDE mentees have successfully published using the ABC plan.<sup>7,28,29</sup>

## CONCLUSIONS

The OHD PRIDE WAGs had no statistically significant impact on participants' frequency and duration of writing. However, by providing a structured approach to developing and/or enhancing a practice of consistent writing, time management skills, and collaborative relationships the WAG has promise for many trainees and early-career faculty, especially those who do not have regular writing habits. The ad-



ditional component of the WAG creating a supportive environment and a sense of community is particularly important for many URM faculty who may feel isolated and underprepared for academic publication. The WAG has potential to be an effective tool as part of a comprehensive approach to developing and preparing URM faculty to be more competitive for peer-reviewed research funding. Based on the evaluation of these WAGs, future work should include a prospective randomized trial to assess the effect of WAGS or other writing interventions on academic outcomes.

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#### CONFLICT OF INTEREST

No conflicts of interest to report.

#### AUTHOR CONTRIBUTIONS

Research concept and design: Thorpe, Bruce; Acquisition of data: Thorpe, Bruce; Data analysis and interpretation: Thorpe, Bruce, Norris, Heitman, Beech; Manuscript draft: Thorpe, Heitman, Beech, Norris; Statistical expertise: Thorpe; Acquisition of funding: Beech, Norris; Administrative: Bruce; Supervision: Thorpe

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