Author's response to reviews

Title: Is Provider Type Associated with Cancer Screening and Prevention? Advanced Practice Registered Nurses, Physician Assistants, and Physicians.

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Dr. Terry Cronan  
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Is Provider Type Associated with Cancer Screening and Prevention? Advanced Practice Registered Nurses, Physician Assistants, and Physicians

Dear Dr. Cronan:

Thank you for the opportunity to resubmit the revised manuscript, “Is Provider Type Associated with Cancer Screening and Prevention? Advanced Practice Registered Nurses, Physician Assistants, and Physicians.” We would like to thank the two reviewers for their positive critique, insightful comments, and clear guidance for improvement of this manuscript. We have fully addressed each comment described below as noted by line and page number for the manuscript. We believe the changes have strengthened this manuscript. We are confident that this study will contribute to the rich literature of BMC Cancer.

Reviewer Number: 1

1. My main comment is about the primary predictor variable: categorizing the groups as PCP alone vs. PCP with APRN/PA appears to dilute the major research question about whether nurse practitioners and physicians assistants can effectively deliver these preventive services. This is especially true since the dataset used in the analysis cannot identify whether the service was provided by a specific provider, only whether it was received. Even if there are small numbers within this large dataset, it is possible to report the prevention and screening practices among those who only saw APRN/PAs during the year?

As recommended by the reviewer, we have provided extra information about the number of participants who saw an APRN/PA exclusively (pages 6 and 7, line 124-128). We have also provided the rationale for why this group cannot be isolated for analysis with these secondary data (page 7, lines 128-130).

Note modified text below:
Less than 300 out of a total of 15,171 women (prior to limiting by other factors such as age, classifiable provider type, and past cancer diagnoses) in the entire 2010 sample adult file indicated that they saw an APRN/PA without seeing either a general physician or an OB/GYN. Due to the very small number of participants who would have been eligible for our analyses and saw APRNs and PAs exclusively, we were unable to isolate distinct provider categories within those who saw an APRN/PA.

1a. Or alternatively, providing some national context for how many nurse practitioners and physicians assistants tend to practice in collaboration with a PCP (rather than alone) might make the existing grouped categorization more meaningful for the reader.

We appreciate the suggestion on providing national context on the scope of APRN and PA practice and included this information on page 7, lines 130-136.

**Note modified text below:**

PAs practice with an overseeing physician, and APRNs’ scope of independent practice and prescribing authority vary from state to state. As of 2013, only 16 states and the District of Columbia, granted APRNs independent diagnosing and prescribing authority [13]. This may have contributed to the small number of participants who saw an APRN/PA without seeing a PCP.

1b. As the findings currently read, the importance of seeing a PCP for preventive screenings (with or without an APRN/PA) jump out as the most essential conclusions of the paper -- that is, that it is much worse to see specialists alone, with the APRN/PA finding somewhat more minor.

To address this request for more emphasis on the finding that seeing a PCP with/ without an APRN/PA is associated with increased cancer screening, language has been changed in the abstract on page 3, line 49, and in the discussion on page 12, lines 248-251, to reflect the main finding of this paper.

**Note modified text below:**

From abstract:

Seeing a PCP alone, or in conjunction with an APRN/PA is associated with patient receipt of guideline-consistent cancer prevention and screening recommendations.

From discussion:

These findings are supported by previous literature that suggests the availability of primary care physicians is one of the most influential factors related to self-rated health, public health, and population health outcomes [23-25].
2. It seems that the more specific overview of previous studies in this area (in the 3rd paragraph of the Intro) would be better suited in the Discussion as a direct comparison to your findings.

We appreciate Reviewer 1’s recommendation for strengthening the discussion section. As suggested, we have moved this section of previous studies to the discussion section on page 12, lines 253-264.

Note modified text below:

From discussion:

Our study adds to the limited literature assessing the effects of an APRN/PA visit on cancer risk factor reduction and screening recommendations. Only a small number of studies have evaluated cancer screening and risk reduction recommendations by provider type or by APRN/PA. These studies generally report high levels of Pap test, mammography or colorectal cancer screening ordered or performed by nurse practitioners (NP) [26-30] and in some situations NP had better performance than their physician counterparts [30]. Other studies have shown that patients interacting with NP, certified nurse midwives (CNM), or PA in both primary care facilities and hospitals are likely to receive smoking cessation counseling [26, 27, 31-35]. In addition, a few studies have shown that NP are more likely to counsel on diet and physical activity than their physician counterparts [27, 31, 32] while some noted that APRN/PA provide counseling on physical activity to less than a quarter of their patients [27, 32]. These studies generally had small samples and rarely had comparison groups or evaluated multiple cancer control interventions in the same populations. Further, none of these studies reported cancer screening or risk reduction recommendations in relation to evidence-based guidelines.

3. Mentioning the theoretical framework in both the Intro and Methods without describing more specifically how your variables of interest matched to this model raises additional questions. I recommended removing the model or adding more specifics about its application. For example, the last sentence on page 4 when discussing the model mentions the "availability of primary care physicians" as a critical factor -- but I don't think this is something that can be measured directly in your work.

We appreciate this feedback and have incorporated the suggestions in the revision of this manuscript. We have expanded on how the theoretical framework provided the basis for the variables of interest in page 6, lines 103-107, lines 109-110, and 113-116. We have also moved the line “The availability of primary care physicians is one of the most influential factors related to self-rated health, public health, and population health outcomes” to the discussion (page 12, lines 273-276) where it provides support for the findings of this study.

Note modified text below:
From the Methods:

Aday and Anderson’s model can be applied empirically to assess how these factors impact access to health services. According to the model, the organizational structure of a healthcare system, such as the types of healthcare providers available, influence patients’ access to and receipt of recommended healthcare services [10]. Characteristics of a healthcare delivery system such as type of provider available and seen have been shown to influence treatment, self-care, and health outcomes in other studies [11, 12]. Thus, the model was central to the selection and construction of the research question and outcomes of interest.

Measures

The selection of the primary independent variable of interest is guided by the theoretical framework, which posits that the type of medical provider seen in the past 12 months has an effect on dependent variables, which include receipt of recommended cancer screening, HPV vaccination, and cancer prevention behavioral recommendations.

4. Minutes of physical activity -- please clarify that this survey item was assessed as yes/no (receipt of counseling to continue/start exercise), not specific to the amount of physical activity (e.g., 150 minutes of moderate or vigorous exercise/week).

The Cancer Control Supplement question on health care provider recommendation for physical activity is a YES/NO item asking if a healthcare provider had recommended for the respondent to begin or continue exercise or physical activity in the past 12 months. We have addressed the concern that this item’s measurement needs clarification in page 7, line 144 and in the definition of physical activity recommendations on page 8, line 165.

Note modified text below:

From the Methods:

Lastly, presence or absence of provider recommendations for physical activity in the past 12 months were also measured [19].

Physical activity recommendations were measured as a receipt of advice by a health care provider to begin or continue any type of exercise or physical activity within the past 12 months, and were investigated among females and males separately, aged 18 and older [19].
5. Both the first paragraph and the last paragraph of the Methods mention the IRB, which is duplicative.

We searched the manuscript for the terms “Institutional Review Board” and “IRB” with the search function in Microsoft Word and confirmed that these terms were only present in the final paragraph of the Methods section (page 9, line 189). At present we are confident that this concern has been addressed.

Reviewer Number: 2

1. In p.4 line 19, the author reports that 'The Cancer Control Supplement had a response rate of 60.8%'. Based on this relatively low response rate, please discuss how the result could be biased.

We have mentioned that sample weights adjust for nonresponse in page 5, lines 96 and 97.

Note modified text below:

We used the sample weight assigned to each survey respondent, accounting for the probability of selection, as well as adjustment for nonresponse by sample strata.

2. In Table 2, please check the number (666.8%) in the adjusted proportion received a Pap test among those with no healthcare provider.

The error has been corrected in Table 2, row 8, column 3.

3. P.2 and later: Descriptions of the type of medical providers do not agree in order, which could be confusing. -- Current expression: 'an APRN/PA and a PCP' and 'a PCP without an APRN/PA' -- please consider changing to: 'a PCP and an APRN/PA' and 'a PCP without an APRN/PA'

We have standardized the order of the provider type as per the suggested order. All references to an APRN/PA and a PCP have been changed to a PCP and an APRN/PA as recommended. The revisions can be found on page 2, lines 40, and 43; page 6, lines 121; page 9, lines 178; page 10, lines 204, 206, 208, 214, 217; page 11, lines 222, 228, 230, 233, and 245. More terminology revisions can also be found on Table 1, row 1, column 4; Tables 2 and 3, row 5, column 1; and Table 4, row 6, column 1.

Thank you again for the opportunity to revise and resubmit this manuscript. We believe we have fully addressed all the editorial and reviewer concerns as described above and the manuscript is greatly improved.
Sincerely,

[Signature]

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