ORIGINAL RESEARCH ARTICLE

The relationship between sedentary lifestyle and marital stability among U.S. adults

DOI: 10.29063/ajrh2025/v29i12.18

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Abstract

This study aims to explore the association between a sedentary lifestyle and marital dissolution. The research sample was drawn from 7,940 individuals aged 20 and above who participated in the National Health and Nutrition Examination Survey (NHANES) from 2013 to 2018. In this study, a logistic regression model was employed to estimate the odds ratio (OR) of the relationship between sedentary behavior and marital dissolution. After adjusting for all covariates, sedentary behavior of 600 minutes or more was significantly associated with marital dissolution, with an odds ratio (OR) of 1.191 (95% CI: 1.026-1.381, P<0.05); sedentary behavior in men was not statistically significant (P>0.05); after adjusting for all covariates, sedentary behavior of 600 minutes or more in women was significantly associated with marital dissolution, OR=1.300 (95% CI: 1.067-1.583, *P*<0.01). The research findings suggest that prolonged sedentary behavior may be a potential risk factor for marital dissolution. *(Afr J Reprod Health 2025; 29 [12]: 183-191).*

Keywords: Sedentary behavior, Marital dissolution, Gender disparity

Résumé

Cette étude vise à explorer le lien entre un mode de vie sédentaire et la dissolution du mariage. L'échantillon de recherche a été tiré de 7 940 personnes âgées de 20 ans et plus qui ont participé à l'enquête nationale sur la santé et la nutrition (NHANES) entre 2013 et 2018. Dans cette étude, un modèle de régression logistique a été utilisé pour estimer le rapport de cotes (RC) de la relation entre le comportement sédentaire et la dissolution du mariage. Après ajustement pour toutes les covariables, un comportement sédentaire de 600 minutes ou plus était significativement associé à la dissolution du mariage, avec un rapport de cotes (RC) de 1,191 (IC à 95 % : 1,026-1,381, P < 0,05) ; le comportement sédentaire chez les hommes n'était pas statistiquement significatif (P > 0,05) ; après ajustement pour toutes les covariables, un comportement sédentaire de 600 minutes ou plus chez les femmes était significativement associé à la dissolution du mariage, OR = 1,300 (IC à 95 % : 1,067-1,583, P < 0,01). Les résultats de la recherche suggèrent qu'un comportement sédentaire prolongé peut être un facteur de risque potentiel de dissolution du mariage. *(Afr J Reprod Health 2025; 29 [12]: 183-191).*

Mots-clés: Comportement sédentaire, Dissolution du mariage, Disparité entre les sexes

Introduction

Sedentary lifestyle has become the norm in modern society. With the prevalence of electronic devices and changes in office environments, more and more people are choosing to sit for long periods of time during their work, study, and leisure activities. Prolonged sitting not only puts pressure on the bones, muscles, and joints, but can also lead to physiological issues such as changes in muscle enzymes and slowed metabolism.[1] In addition, sedentary behavior also elevates the risks of various diseases such as obesity, cardiovascular diseases, and psychiatric disorders, exerting long-term negative impacts on both people's physical and mental health.[2]

Marriage represents not only the legal and social union of two individuals but also involves emotions, responsibilities, and obligations. Divorce not only causes significant harm to individuals but also puts pressure on family members, leading to strained relationships. Children may face the shadow of a broken family, experience an unstable environment, and suffer adverse effects on their psychological and emotional development.[3,4] Changes in marital status often coincide with

lifestyle adjustments, and there may be a certain relationship between sedentary behavior and marital dissolution. Therefore, this study aims to explore the relationship between sedentary lifestyle and marital dissolution.

On one hand, marital status may directly influence an individual's sedentary behavior. For example, married individuals may be more inclined to choose a stable lifestyle due to family responsibilities and work pressures, leading to reduced outdoor activities and physical exercise, thereby increasing the likelihood of sedentary lifestyle.[5,6] On the other hand, a sedentary lifestyle may also have an impact on marital dissolution. Prolonged sitting can result in health issues such as obesity and cardiovascular diseases, which not only affect individuals' quality of life but may also have negative effects on the interaction and emotional connection between spouses.[7] Additionally, sedentary behavior could lead to psychological problems such as anxiety and depression, which could also have a negative impact on marital relationships.[8] Furthermore, Gender disparity may play an important role in the relationship between sedentary behavior and marital status.[9] There are significant differences between males and females in physiological, psychological, and social roles.[10-12] These differences may lead to varying attitudes and coping strategies when facing sedentary issues. Moreover, the influence of marital status on males and females may also differ, further complicating the study of this relationship.

Therefore, there may be a complex and subtle relationship between sedentary behavior and marital status. Through in-depth research on this relationship, we can better understand the impact of sedentary behavior on individual health and family life, providing a scientific basis for the development of effective intervention measures. Moreover, this research can help us address the prevalent issue of sedentary behavior in modern society, ultimately enhancing people's quality of life and well-being.

Methods

Ethics approval and consent to participate

All procedures in the study complied with the Declaration of Helsinki, with NHANES study protocols approved by the NCHS Research Ethics Review Board (Protocol#2017–1) and all adult participants providing informed consent by signing a form acknowledging the study's purpose, risks, and benefits.

Study population

The data and samples for this study were obtained from the NHANES. The NHANES sample is designed to represent the U.S. population and excludes institutionalized civilians (e.g., those in supervised care or guardianship) and active-duty military personnel or citizens residing outside of the 50 states and the District of Columbia.[13] This study utilized a representative sample of 7,940 individuals aged 20 and above selected by NHANES during the period from 2013 to 2018. The Institutional Review Board of the National Center for Health Statistics approved the secondary analysis of the survey protocol and data. All adult participants in the NHANES provided informed consent for the purposes, risks, and benefits of this study, and signed an informed consent form.[14]

Covariates

In this study, variables that may potentially influence the dependent variable will be included as covariates. Covariates included gender, age, race, education, income poverty ratio, body mass index (BMI) and current health status. Race was divided into Hispanic, non-Hispanic white, non-Hispanic black, non-Hispanic Asian and other races. The education level was divided into below high school, high school and above high school. The income poverty ratio is the poverty criterion divided by household income by the survey year. In the present study, the poverty ratio was used to create two income situations, poverty (<1.3) and middle income (≥1.3).[15] BMI was divided into underweight (<19kg/m^2), normal (19-24.9kg/m^2), overweight (25-29.9kg/m^2) and obesity (≥30kg/m^2).[16] Current health status is classified as excellent, good, fair, poor, or very poor based on self-rated health questions in the NHANES.

Sedentary behavior assessment

Sedentary behavior is defined as the amount of time spent in a sitting position during daily activities,

including but not limited to sitting while watching television or using a computer.[13] Sedentary behavior data were extracted from the adult part of the Physical Activity Questionnaire (PAQ), which is based on the Global Physical Activity Questionnaire (GPAQ). This questionnaire provides interview data on the respondent level of physical activity. Participants aged 18 and above are eligible to participate in the adult part of the PAQ. The Computer Assisted Personal Interview (CAPI) system was used at home by trained interviewers to ask questions and record the sample's sedentary time on a typical day. We used 600 minutes as a reference for sedentary time in a day.[17] In the final database, the code '1' represents sedentary time <600min and code '2' represents sedentary time ≥600min.

Marital dissolution assessment

Marital dissolution data were extracted from the demographic section of NHANES population statistics. Trained interviewers used the CAPI system to conduct demographic questionnaires at participants' homes. The CAPI system was programmed with built-in consistency checks to reduce data entry errors. marital dissolution included the following categories: married, widowed, divorced, separated, never married and living with partner. For the purpose of research, data other than married and divorced were excluded. In the final database, the codes "0" and "1" represented married and divorced, respectively.

Statistical analysis

We used Microsoft Excel 2010 to extract and merge the original data and exclude missing and useless (reject, don't know) items. The database includes adults aged 20 and above with complete information. In accordance with the purpose of this study, we conducted significance tests for covariate differences between the "married group" and "divorced group". Rank sum tests were used for continuous variables, and chi-square tests were used for categorical variables. We analyzed the relationship between sedentary behavior and marital dissolution, as well as Gender disparity, using binary logistic regression models. All data were analyzed using SPSS 26.0 (2019), with a P-value less than 0.05 considered statistically significant (two-tailed test). Variables with statistically significant results in the univariate analysis were included in a stepwise binary logistic regression analysis. A-entry=0.05 and a-exit=0.10 were used to select and exclude covariates.

All covariates (P<0.05) exhibited statistical significance in the univariate analysis. In the significance test of the measured data, the P-value for age was 0.05 (variance is not homogeneous) and P (two-sided) < 0.001, indicating that the difference was not statistically significant. For the analysis of the relationship between sedentary behavior and marital dissolution using a binary logistic regression model, sedentary behavior was considered the independent variable (1 < 600 minutes, 2 ≥ 600 minutes) and marital dissolution (0 = married, 1 = divorced) the dependent variable. In order to eliminate the influence of covariates, we established the following model: Model I: adjusted for sedentary behavior alone as the independent variable, while Model II: included statistically significant covariates (gender, race, educational attainment, poverty ratio, marital dissolution, BMI, and current health status) in addition to the independent variables in Model I. Covariates were not included in the model. Binary logistic regression analyses of the relationship between sedentary behavior and marital dissolution were conducted for males and females, first without adjusting for any covariates and then adjusting for all statistically significant covariates in the subgroup analyses by gender. The Restricted Cubic Spline (RCS) curve in this study was generated using R software (version 4.3.3). The RCS curve illustrates the non-linear relationship between the dependent variable and the independent variable. The horizontal axis represents the independent variable, while the vertical axis displays the OR (95%CI). A significance level of P<0.05 was considered statistically significant.

Results

Demographic characteristics

A total of 7940 individuals aged 20 and above in the 2013-2018 National Health and Nutrition Survey cycle were included in the present study. They completed data on sedentary behavior duration,

Table 1: Marital status of a sample of the US adults aged 20 and above (N=7940) according to their demographic characteristics

Characteristics, n%	Total (N = 7940)	Married (n = 6480)	Divorced (n = 1460)	Statistic	*P*
Age	53.15±15.29	54.59±15.35	51.67±15.07	-10.44	<.001
Gender				71.92	<.001
Male	4048 (50.98)	3450 (53.24)	598 (40.96)		
Female	3892 (49.02)	3030 (46.76)	862 (59.04)		
Race				220.27	<.001
Hispanic	1938 (24.41)	1651 (25.48)	287 (19.66)		
Non-Hispanic White	3323 (41.85)	2692 (41.54)	631 (43.22)		
Non-Hispanic Black	1317 (16.59)	927 (14.31)	390 (26.71)		
Non-Hispanic Asian	1088 (13.70)	1005 (15.51)	83 (5.68)		
Other	274 (3.45)	205 (3.16)	69 (4.73)		
Education				16.90	<.001
Below high school	1491 (18.78)	1243 (19.18)	248 (16.99)		
High school graduate	1689 (21.27)	1322 (20.40)	367 (25.14)		
Post high school	4760 (59.95)	3915 (60.42)	845 (57.88)		
Income to Poverty				221.85	<.001
Impoverished	2032 (25.59)	1434 (22.13)	598 (40.96)		
Moderate income	5908 (74.41)	5046 (77.87)	862 (59.04)		
BMI				12.39	0.006
Underweight	125 (1.57)	99 (1.53)	26 (1.78)		
Normal weight	1924 (24.23)	1584 (24.44)	340 (23.29)		
Overweight	2651 (33.39)	2208 (34.07)	443 (30.34)		
Obese	3240 (40.81)	2589 (39.95)	651 (44.59)		
Current Health Status				49.95	<.001
Excellent	694 (8.74)	601 (9.27)	93 (6.37)		
Very good	2116 (26.65)	1775 (27.39)	341 (23.36)		
Good	3319 (41.80)	2716 (41.91)	603 (41.30)		
Fair	1560 (19.65)	1202 (18.55)	358 (24.52)		
Poor	251 (3.16)	186 (2.87)	65 (4.45)		
Sedentary Behavior				4.80	0.029
<600min	6416 (80.81)	5266 (81.27)	1150 (78.77)		
≥600min	1524 (19.19)	1214 (18.73)	310 (21.23)		

Note: [a] Chi-square test, [b] Kruskal-Wallis-test, $^{*}P < 0.05$, $^{**}P < 0.01$, $^{***}P < 0.001$.

marital dissolution and other demographic information. There were statistically significant differences in all covariates and independent variables between the married group and the divorced group, except for age. (See Table 1)

The relationship between sedentary lifestyle and marital dissolution

In the binary logistic regression analysis, Model I (without adjustment for any covariates) revealed the OR=1.169 (95%CI: 1.016-1.345) for the relationship between sedentary behavior and marital dissolution. Model II (adjusting all covariates) showed the OR=1.191 (95%CI: 1.026-1.381). The results indicate that with adjustment for all covariates, more sedentary behavior is associated with a higher likelihood of divorce. Individuals who engage in sedentary behavior for 600 minutes or more per day have a 19.1% increased probability of divorce (P<0.05) (see Table 2).

Table 2: Logistic regression analysis of sedentary behavior and marital dissolution (N=7940)

Mode	*b*	SE	Z	*P*	OR(95%Cl)
I[a]	0.156	0.071	2.188	0.029*	1.169（1.016-1.345）
II[b]	0.174	0.076	2.302	0.021*	1.191（1.026-1.381）

Note: [a] Only adjusted the independent variable sedentary behavior. [b] According to the independent variables in Model I, all variables (gender, race, education level, marital status, income poverty ratio, BMI and current health status) were added for adjustment. *$P < 0.05$.

Table 3: Logistic regression analysis of sedentary behavior and marital dissolution among men (n=4048)

Mode	*b*	SE	Z	*P*	OR(95%Cl)
III[c]	0.017	0.111	0.153	0.879	1.017（0.819-1.263）
IV[d]	0.057	0.117	0.487	0.626	1.058（0.842-1.330）

Note: [c] Only adjusted the independent variable sedentary behavior. [d] According to the independent variables in Model III, all variables (gender, race, education level, marital status, income poverty ratio, BMI and current health status) were added for adjustment.

Table 4: Logistic regression analysis of sedentary behavior and marital dissolution among women (n=3892)

Mode	*b*	SE	Z	*P*	OR(95%Cl)
V[e]	0.286	0.095	3.005	0.003**	1.331（1.104-1.603）
VI[f]	0.262	0.101	2.606	0.009**	1.300（1.067-1.583）

Note: [e] Only adjusted the independent variable sedentary behavior. [f] According to the independent variables in Model V, all variables (gender, race, education level, marital status, income poverty ratio, BMI and current health status) were added for adjustment. **$P < 0.01$.

The relationship between sedentary lifestyle and marital dissolution in men

In the binary logistic regression analysis of sedentary behavior and marital dissolution in males, both Model III (without adjustment for any covariates) and Model IV (adjusted for all covariates) did not show statistical significance (P>0.05) (see Table 3).

The relationship between sedentary lifestyle and marital dissolution in women

In the binary logistic regression analysis of sedentary behavior and marital dissolution in females, Model V (without adjustment for any covariates) showed the OR=1.331 (95%CI: 1.104-1.603) for the relationship between sedentary behavior and marital dissolution. Model VI (adjusted for all covariates) showed the OR=1.300 (95%CI: 1.067-1.583). The results indicate that with adjustment for all covariates, more sedentary behavior is associated with a higher likelihood of divorce in females. Females who engage in sedentary behavior for 600 minutes or more per day have a 30% increased probability of divorce (P<0.01) (see Table 4).

As shown in Figure 1, The RCS curve exhibits an overall "U"-shaped profile. When females engage in sedentary behavior for less than 150 minutes or more than 380 minutes per day, the OR for the relationship between sedentary behavior and marital dissolution is greater than 1. When females engage in sedentary behavior for 150 to 380 minutes per day, the OR for the relationship between sedentary behavior and marital dissolution is less than 1. The results indicate that the probability of divorce increases when females engage in sedentary behavior for less than 150 minutes or more than 380 minutes per day, while the probability of divorce decreases when sedentary behavior falls within the range of 150 to 380 minutes (2.5–6.3 hours) per day (See Figure 1).

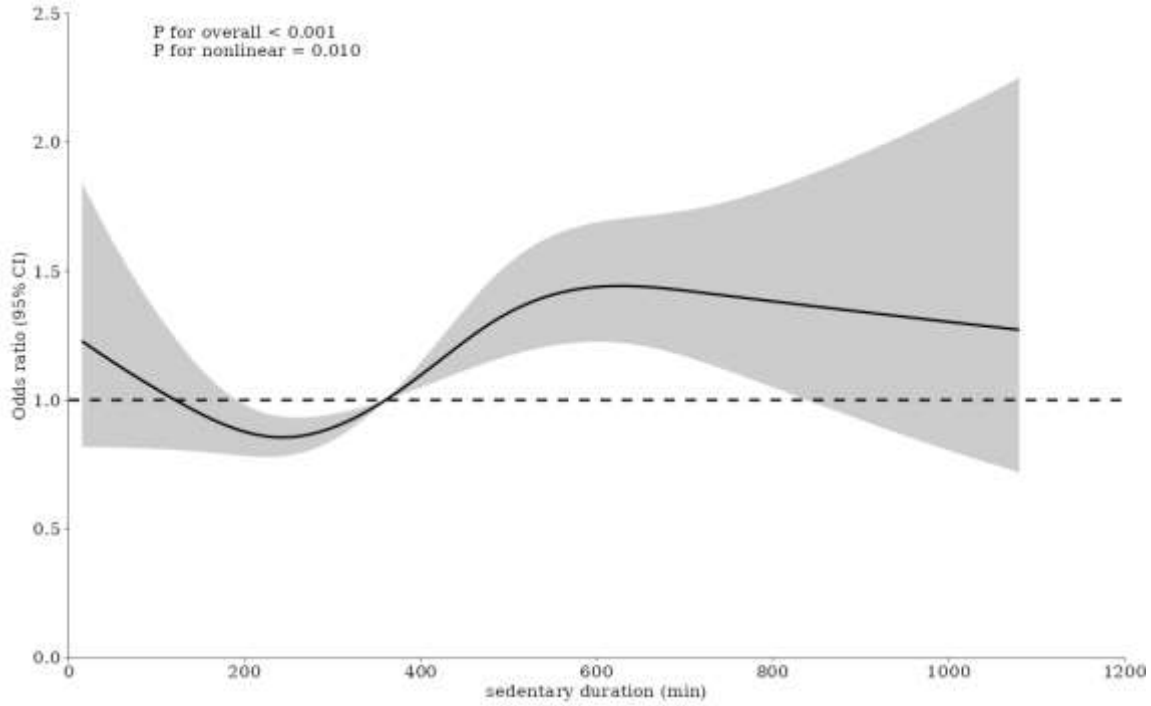

Figure 1: RCS curves of the association between sedentary duration (min) and marital dissolution in women

Discussion

A binary logistic regression analysis of NHANES data from 2013 to 2018 revealed an independent correlation between sedentary behavior and marital dissolution among adults over 20 years old. Therefore, we will discuss the relationship between sedentary behavior and marital dissolution in the following text.

Sedentary lifestyle and marital dissolution

Previous studies have demonstrated that individuals tend to reduce their physical activity and increase sedentary behavior after getting married and having children.[18-20] However, few studies have linked sedentary behavior to marital dissolution. The findings of this study indicate a positive correlation between sedentary behavior and marital dissolution. In gender - based subgroup analyses, a sedentary lifestyle among women shows a positive association with an increased risk of marital dissolution, whereas no significant correlation is observed between sedentary behavior and marital status among men. This may be a new finding, but it is consistent with previous research on the impact of health behaviors on gender.[10-12] The following discussion will explore the potential reasons for this finding from physiological, psychological, and social perspectives.

Firstly, from a physiological perspective, there may be certain differences in the impact of sedentary behavior on men and women. While prolonged sitting has adverse effects on the physical health of both genders, such as obesity and cardiovascular diseases.[21, 22] These physiological issues may not directly increase the risk of marital dissolution in men. Conversely, the health problems that may arise from sedentary behavior in women, such as endocrine disorders and mood fluctuations,[23,24] are more likely to directly impact marital relationships. Women's endocrine system is closely linked to their emotions and psychological states, and the stability of these emotions is directly related to the quality of interaction and communication between spouses. Therefore, the physiological issues caused by sedentary behavior in women may indirectly affect marital relationships.

Psychological factors also play a significant role. Men and women often differ in their coping

strategies for stress, emotional regulation, and communication of needs.[25] Men may be more inclined to cope with stress through solitude or silence, while women tend to seek emotional support through communication and sharing.[26, 27] Therefore, when women spend excessive time sitting and lack sufficient exercise and social activities, they may be more prone to feelings of loneliness, anxiety, and depression. These negative emotions can further strain their relationships with their partners. Additionally, a sedentary lifestyle in women may also result in their social and emotional needs not being met, thereby increasing the risk of marital dissolution.

Sociocultural factors also contribute to this phenomenon. In traditional social concepts, men are often typically bear greater economic responsibilities and career pursuits, while women are more often tasked with the roles of family and emotional support.[28, 29] This role allocation may lead women to place greater emphasis on emotional communication and the quality of intimate relationships within marriage. Therefore, when women's sedentary behavior leads to unfulfilled emotional needs, they may be more prone to dissatisfaction and disappointment in their marriages, subsequently increasing the risk of divorce.[30] Additionally, women's role in the family may also make them more susceptible to the impact of sedentary behavior. Women typically engage more in household chores and childcare tasks, which often require extended periods of sitting. Prolonged engagement in these activities may deprive women of sufficient time and energy to attend to their own physical and mental well-being, thereby increasing the risk of sedentary behavior. Conversely, men are less involved in these activities, and thus the association between their sedentary behavior and marital dissolution may be relatively smaller.

Furthermore, when male sedentary behavior exceeds 600 minutes, there is a trend towards an increased risk of marital dissolution. This suggests that sedentary behavior in men may also be a potential risk factor for marital instability. Sedentary behavior may contribute to marital instability by affecting physical and mental health, such as through the onset of chronic diseases and negative emotions.[2-4]

In summary, prolonged sedentary behavior is an unhealthy lifestyle. Both men and women should avoid sitting for extended periods to maintain physical and mental health, as well as marital stability. However, it is equally important to recognize that marital stability is not solely determined by a single factor, but rather the result of multiple factors acting together. They should actively take measures to improve their lifestyle, thereby promoting marital stability and happiness. Meanwhile, both parties should enhance communication and understanding, working together to address life's challenges and difficulties in order to sustain a lasting and satisfying marriage.

Limitations of this study

This study not only holds significant practical implications but also demonstrates its unique innovativeness. However, there are several limitations to note. Firstly, marital status is a complex domain influenced by numerous intersecting factors, and its underlying mechanisms are extremely intricate. This study has not comprehensively excluded covariates, such as lifestyle behaviors during marriage like smoking and alcohol consumption, which were not obtained. Secondly, the assessment of sedentary behavior in this study relies on participants' self-reports, which may lead to an underestimation or overestimation of their actual sedentary time. Furthermore, our study employed a cross-sectional design, which does not allow for the establishment of causality between sedentary behavior and marital dissolution.

To advance the research, we need to strive to overcome these limitations in future studies. Meanwhile, exploring more factors related to marital dissolution will be a valuable research task. Such studies will not only help us gain a deeper understanding of the multidimensional causes of marital dissolution but also provide strong support for enhancing people's quality of life and happiness. Through continuous exploration and effort, we aim to contribute more wisdom and strength to this field of research.

Conclusion

The results of this study reveal a positive correlation between sedentary behavior and marital dissolution. Among the male population, no significant association was found between a sedentary lifestyle and marital status; in contrast, excessive sedentary behavior in the female population exhibits a positive correlation with the risk of marital dissolution. Therefore, Therefore, we recommend reducing sedentary behavior by increasing intermittent standing or moderate-intensity physical activity to maintain a healthy marital relationship.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and/or analysed during the current study are available in the [NHANES] repository, [NHANES Questionnaires, Datasets, and Related Documentation (cdc.gov)]. Raw data supporting the obtained results are available at the corresponding author.

Author contributions

YY and TW conceived and designed the study. YW and JD organized the database, performed the statistical analysis and wrote the manuscript. YW and JD confirmed the accuracy of the written language. YW, JD, YY and TW revised the manuscript. All authors edited, revised, and certified the final version of this manuscript.

Funding

No funding.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Acknowledgments

We would like to thank all the staff and participants of the National Health and Nutrition Examination Survey 2013-2018 cycles for their valuable contributions. We would also like to thank the editors and reviewers for their valuable and constructive comments to help us improve the manuscript.

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