

Education and Participation in Politics

My Nguyen, Huong T. T. Hoang, Thuy Trang, Khoi Duc, Kien Le & Hang Khanh

Abstract

While the robust and positive association between education and political engagement has been widely documented, the direct causal link is still a subject of debate. This study contributes to the ongoing debate by examining whether there exists a causal effect of education on political engagement. Exploiting the plausibly exogenous variation in education induced by the compulsory schooling reforms across 39 countries, we find that education cultivates political interest, promotes the acquisition of political knowledge, and fosters supportive attitudes towards political freedoms. Nevertheless, the better educated are no more likely to vote in elections nor adopt any specific position in the left-right political spectrum.

Keywords: Political Participation, Education, Compulsory Schooling

Introduction

Political engagement refers to emotional and cognitive involvement in political matters, such as political knowledge, interest, opinions, or attitudes; and encompasses citizens' actions to influence decisions of public officials such as voting, protesting, or political membership (Verba et al., 1995; Brady, 1999; Zukin et al., 2006; Barrett and Brunton-Smith, 2014). Social scientists have long embraced the belief that democracy is founded on an educated population (Smith, 1776; Friedman, 1962; Dahl, 1973). Therefore, political engagement as a return to education remains a focal point of social science research for years. Although the correlation between educational attainment and political engagement is documented in various settings (Wolfinger and Rosenstone, 1980; Putnam, 1995), a fewer number of attempts have been made to account for the endogeneity of education and establish a causal relationship. Consequently, two competing explanations for the positive association between education and political engagement have been developed. The 'cause' view states that education directly causes political engagement by teaching citizens the knowledge and behaviors needed for understanding politics, identifying political preferences, and pursuing political interests.¹ Meanwhile, the 'sorting-mechanism' view argues that education simply takes credit for other factors that simultaneously determine educational attainment and political engagement, such as social network position and cognitive ability.

To examine the relationship between educational attainment and political engagement, we employ the Role of Government module of the International Social Survey Programme. The dataset provides a wide range of political opinions, attitudes, and behaviors for a large number of countries. In terms of identification, we exploit the plausibly exogenous changes in educational years induced by the compulsory education reforms, within an Instrumental Variable framework. The reforms raise the mandatory years of education by one or more years for cohorts born after a

given year while those who just missed the age cut-off of the law are not affected. As a result, individuals born two or three years apart are subject to different levels of compulsory schooling, which ultimately affects their educational attainment. Our study reaches the following findings. First, an additional year of education raises the individual's interest in politics by 6.7 percentage points and increases the individual's selfperceived political knowledge by 8.5 percentage points. Second, education further fosters supportive attitudes towards political freedoms. Particularly, a one-year increase in education raises the probability of the individual endorsing the organization of public meetings and marches-demonstrations to protest against the government by 6.0 and 8.0 percentage points, respectively. The individual is also 10.4 and 6.2 percentage points more likely to support revolutionists' organization of public meetings and book publication to express their views. Nevertheless, the better educated are no more likely to vote in the election nor adopt any specific position in the left-right political spectrum.

Although we do not find the educational effects on political affiliation and voting behavior, extra schooling still fosters political interest, political knowledge, and supportive attitudes towards political freedoms. Therefore, the role of education in a representative democracy may not lie with increasing the quantity of citizens' political involvement (voting and affiliation) but lie with enhancing the quality of their involvement (interest, knowledge, attitudes). To an extent that a fully informed electorate can improve the quality of democracy, our findings underscore the positive externalities of education and justify government interventions in the provision and financing of education.

Literature Review

The robust and positive association between education and political engagement has been widely documented. To explain this strong correlation, two competing views have been developed. First,

the 'cause' view, build on the civic education hypothesis, argues that education can expand individuals capacity by teaching citizens the knowledge and behaviors needed for understanding politics, identifying political preferences, and pursuing political interests. To put it differently, this hypothesis argues that education can stimulate political engagement by lowering both cognitive and material costs to become politically involved (Wolfinger and Rosenstone, 1980; Rosenstone and Hansen, 1993). For example, education not only equips citizens with basic literacy skills to have minimal understanding of the political system but also imparts political knowledge and familiarity that help in navigating the political world (Niemi and Junn, 1998; Torney-Purta et al., 1999; Galston, 2001). In contrast, the 'sorting-mechanism' view, build on the social network and political meritocracy hypotheses, argues that education does not actually stimulate but simply predict political involvement by serving as a proxy for other factors. The social network hypothesis believes that education can influence political engagement by determining an individuals social network position (Nie et al., 1996). In other words, education serves as a sorting system in which more educated individuals tend to posit closer to the center of important social and political networks. For examples, factors such as parents' political orientation and participation not only affect their children's political engagement but also determine educational attainment (Westholm, 1999; Achen, 2002; Andolina, 2003). Also build on the 'sorting-mechanism', the political meritocracy hypothesis believes that both education and political engagement are produced by cognitive ability. In other words, individuals with higher innate ability are more likely to proceed further in school and also to engage in politics at higher rates. Therefore, once the cognitive ability is taken into account, education should have no impact on political engagement (Luskin, 1990; Herrnstein and Murray, 1994). Recently, empirical studies have employed more sophisticated methods to examine whether there exists a causal effect of education on political engagement (the

‘cause’ view) or education is simply a proxy for other factors (the ‘sorting-mechanism’ view). However, the conclusion is still not clear. For example, Dee (2004) exploits the adoption of child labor laws in the U.S within the Instrumental Variable framework to conclude that education promotes voter participation and support for free speech. Milligan et al. (2004) uses school leaving age acts in the U.S and U.K as instrumental variables and find that educational attainment is linked to political interest and involvement. They also find a strong relationship between education and voting for the U.S, but not for the U.K. Exploiting various interventions such as preschool activities, extra mentoring, and smaller classes that can affect educational attainment, Sondheimer and Green (2010) provide a strong association between education and voter turnout. Also studying the context of the U.S, Mayer (2011) employs genetic matching to provide consistent evidence that educational attainment increases political participation index composed of eight participatory acts. On the other hand, there are also a number of studies that show support for the ‘sortingmechanism’ view. For example, Kam and Palmer (2008) employ the propensity score matching method to find no statistical relationship between educational attainment and political participation in the U.S. Relying on a reform in the Norwegian educational systems as an exogenous source of variation, Pelkonen (2012) documents that additional education has no impact on voter turnout and several measures of civic outcomes. Exploiting the exogenous rise in education levels induced by the Vietnam-era draft, Berinsky and Lenz (2011) report no evidence that education increases voter turnout among American males. Also focusing on the U.S, Highton (2009) exploits panel data that can account for individual-specific characteristics and shows that there is no significant effect of education on political awareness. Our study brings the following contributions to this ongoing debate. First, we contribute to the unresolved debate on the causal link between education and political engagement by exploiting the plausibly exogenous variation

in education induced by the compulsory schooling reforms to identify the relationship of interest. Second, the paper complements prior works by rigorously examine various dimensions of political engagement, including political interest, knowledge, attitude, voting, and affiliation. Third, the wide coverage of 39 countries in our sample reduce the threats to external validity of our estimates, making the analysis meaningful to policymakers from many governments.

Data

In this study, we employ the International Social Survey Programme (ISSP) which is a cross-national collaboration project where data are collected by individual member countries. The data are then integrated into an international data file and distributed by the GESIS Data Archive for the Social Sciences (Leibniz Institute for the Social Sciences). The ISSP's surveys cover a wide range of topics relevant to social research including citizenship, environment, gender roles, government, etc. For the purpose of our analysis, we employ five waves of the Role of Government module (1985, 1990, 1996, 2006, and 2016) where respondents from each country are asked about their political opinions, attitudes, and behaviors (ISSP-RG). Besides political outcomes, demographic characteristics such as age, gender, marital status, etc. are also available in the module. Drawing from the ISSP-RG, we consider three groups of political outcomes, including (i) degree of interest in and knowledge of politics, (ii) attitudes towards political freedoms, and (iii) participatory acts. To reflect individuals' political interest and knowledge, we construct two variables, Interest in Politics and Knowledge of Politics. These variables are based on respondents' answers to the question about their degree of interest in politics and the self-assessed understanding of important political issues. The responses are placed into a five-point scale with 1 representing the strongest (very) and 5 representing the weakest indicators (not at all). We then compute the variables Interest in Politics and Knowledge of Politics as zero-one indicators taking the value of

one if the response was coded 1 or 2, and zero otherwise. To capture attitudes towards political freedoms, we construct four variables, Protesters' Public Meetings, Protesters' Demonstrations, Revolutionists' Public Meetings, and Revolutionists' Book Publications. These variables are based on respondents' perceptions of people/organizations running protests and revolutions. Specifically, in terms of protests, respondents were asked whether protesters should be allowed to: (i) organize public meetings, and (ii) organize marches and demonstrations. Regarding revolutions, respondents were asked whether revolutionists should be allowed to: (i) organize public meetings, and (ii) publish books. Responses are codified into a four-point scale ranging from 1-definitely to 4-definitely not. Our variables are indicators coded as 1 if the response takes the values of 1 or 2, and zero otherwise. In the third group, participatory acts consist of voting behavior and political affiliation. Voting behavior is measured by an indicator (Vote) that takes the value of one if the respondent voted in the last general election and zero otherwise. Political affiliation is proxied by five zero-one variables, Far-left, Center-left, Center, Right, Far-right. These are indicators for the position in the left-right scale of the party for which the respondent voted. In the political spectrum, the left-wing politics (including the far-left and the center-left) endorses freedom, equality, fraternity, rights, progress, reform, and internationalism while the right-wing politics (including the center-right and the far-right) emphasizes authority, hierarchy, order, duty, tradition, reaction and nationalism (Heywood, 2015). Center (or centrism) refers to a political position in the middle between the left wing and the right wing. Five political affiliation categories are based on the party the respondent voted for and expert judgments from the country-specific parties to convert into the left-right scale (GESIS, 2018).

Results

The estimated impacts of education on individual self-perceived interest in and knowledge of politics are presented in Table 1. Column 1 shows the first-stage coefficient. Columns 2 and 3 provide the OLS estimates. Columns 4 and 5 report the results from the IV models. Columns 6 and 7 display the reduced-form estimates. Each column is a separate regression and the column headings specify the dependent variables. We start with the OLS estimates of the relationships in Columns 2 and 3. Education is positively associated with the level of political interest and knowledge of the individual. Specifically, an additional year of education makes the individual more interested in political affairs by 2.1 percentage points. The effect on the knowledge of politics is statistically significant with the same magnitude. However, as previously mentioned in Section 3, the OLS estimations fail to take into account unobserved factors jointly determining educational attainment and perceptions on the degree of interest and understanding of politics. The apparent positive estimated effect of education produced by the OLS model may reflect the spurious influence of other individual traits such as family socioeconomic status and personal ability. To account for such confounding factors, we need to adopt the IV model which exploits the plausibly exogenous changes in educational attainment.

We proceed to the IV regressions in Columns 4 and 5. We still find positive and statistically significant impacts of education on the extent to which the individual is interested in politics and has a good understanding of politics. An additional year of education raises the individual's interest in politics by 6.7 percentage points and increases the individual's self-perceived knowledge of politics by 8.5 percentage points. These effects represent the 21.3% and 18% increases relative to the control means in Table A2. The Kleibergen-Paap rk Wald F statistics (37.40 and 27.71) exceed the critical value thresholds, rejecting the hypothesis that the instrument is weak.⁴ In other

words, the high values of the F-statistics further suggest that our IV models satisfy the strong first stage condition. The reduced-form estimates are presented in Columns 6 and 7. Exposure to the compulsory education reforms is associated with a higher interest in politics by 4.4 percentage points. Exposed individuals also have better knowledge of politics by 5.5 percentage points. These estimates are both statistically and economically significant, representing the 14% and 11.7% increases compared to the mean values of the control group.

The estimated impacts of educational attainment on attitudes towards political freedoms are reported in Table 2. Columns 1 and 2 provide the OLS estimates. Columns 3 and 4 present the results from the IV models. Columns 5 and 6 display the reduced-form estimates. We look at individuals' perceptions about protests and revolutions in Panel A and B, respectively. In each panel, each column is a separate regression and the column headings specify the dependent variables. Evident from Columns 1 and 2, better educated individuals tend to support political freedoms. The OLS estimates are all positive and statistically significant. Specifically, completing one more year of education makes the individual 0.8 and 1.0 percentage points more likely to think that the organization of public meetings and marches-demonstrations to protest against the government should be allowed, respectively (Panel A). One year increase in educational attainment is also associated with 0.8 and 1.2 percentage points higher probability of the individual thinking that revolutionists should be allowed to hold public meetings and publish books to express their views, respectively (Panel B). Again, the strong correlations produced by the OLS models might just reflect the confounding influence of unobserved characteristics jointly determining an individual's education and attitudes towards political freedoms. Overcoming those shortcomings by comparing individuals whose educational differences are induced by their exposure to the exogenous reforms, the IV estimates in Columns 3 and 4 point 4 The Stock-Yogo weak ID test

critical values are 16.38, 8.96, 6.66 at the 10%, 15%, and 20% maximal IV size, respectively. 13 to the same direction as the OLS ones. Regarding the attitude towards protests, an additional year of education raises the probability that the individual approves of the organization of public meetings and marches-demonstrations to protest against the government by 6.0 and 8.0 percentage points, respectively (Panel A). Looking at the mean values of the control group in Table A2, these estimated impacts imply the average increases by 7.1% and 10.4%. As for the attitude towards revolutions, completing one more year of education makes the individual 10.4 and 6.2 percentage points more likely to support revolutionists' organization of public meetings and book publication to express their views (Panel B). These estimates indicate the 20.3% and 10% increases in the proportions of individuals supporting revolutionary actions.

In both panels, the large first-stage F-statistics suggest that exposure to the compulsory education reforms is a strong instrument for individual educational attainment. Collectively, the results lend evidence for the positive relationship between education and support for 14 political freedoms. Finally, the reduced-form estimates presented in Columns 5 and 6 suggest that exposure to the compulsory education reform indeed makes the individual more likely to endorse political freedoms. Individuals affected by the reforms tend to approve of the use of public meetings and demonstrations-marches as the ways to protest against the government. Such individuals are also inclined to think that the organization of public meetings and the publications of books by revolutionary parties should be allowed.

5.3 Participatory Acts

Thus far, we have provided evidence that education is positively associated with individual interest in and knowledge of politics as well as supportive attitudes towards political freedoms. Now, we proceed to explore whether the effects of educational attainment can translate into changes in participatory acts. We present the estimated impacts of educational attainment on voting behavior and political affiliation

in Table 3. Columns 1 and 2 provide the OLS estimates. Columns 3 and 4 present the results from the IV models. Columns 5 and 6 display the reduced-form estimates. We look at individuals' voting behavior in Panel A. Individuals' affiliation with the left wing, center, and the right wing are examined in Panel B, C, and D, respectively. In each panel, each column is a separate regression and the column headings indicate the dependent variables. Voting – The OLS model produces a positive and significant estimate for the correlation between educational attainment and voting behavior (Panel A, Column 1). Specifically, an additional year of education raises the probability of the individual voting in the general election by 0.7 percentage points. Nevertheless, employing the IV method, we find that the coefficient carries the opposite sign and becomes statistically indistinguishable from zero (Panel A, Column 3). Although we have the strong first stage evident by a high value of the F-statistic, there is no effect of educational attainment on voting once the confounding unobserved determinants of schooling and voting are accounted for. Unsurprisingly, the reduced-form estimate is negative and statistically insignificant.

Political Affiliation – According to the OLS models, the better educated individual is more likely to take the center and center-right positions as well as less likely to adopt the far-right position in the left-right political spectrum (Panel C, Column 1 and Panel D, Columns 1-2). Despite the statistical significance, the magnitudes of the effects are very small. The remaining OLS coefficients are both statistically and economically indistinguishable from zero. As discussed in Section 3, the OLS models only provide biased estimates for the effects of education on political affiliation. It is because unobserved individual and family traits which jointly determine both educational attainment and political outcomes are not controlled for within the OLS framework. Therefore, to account for the endogeneity of education, we employ the IV models which hinge upon the plausibly exogenous variation in educational attainment induced by the compulsory

schooling reforms. The IV estimates in Columns 3 and 4 are all statistically and economically insignificant, suggesting that education seems to not affect individuals' political affiliation. In other words, the better educated are no more likely to adopt any specific position in the left-right political spectrum. Despite the strong first stage evidenced by large F-statistics, all reduced-form estimates are small in magnitude and fall short of conventional significance. Taken together, although education exerts positive effects on political interest, political knowledge, and attitudes towards political freedoms, it does not alter participatory acts in politics. Specifically, more educated individuals are no more likely to participate in voting nor take the left-wing, center, or right-wing positions in the political spectrum.

5.4 Discussions

Collectively, we detect positive impacts of education on individual interest in politics, self-perceived political knowledge, and supportive attitudes towards political freedoms. In particular, an additional year of education raises the individual's interest in politics by 6.7 percentage points and increases the individual's self-perceived political knowledge by 8.5 percentage points. Better-educated individuals also tend to support political freedoms. Specifically, a one-year increase in education raises the probability that the individual endorses the organization of public meetings and marches-demonstrations to protest against the government by 6.0 and 8.0 percentage points, respectively. The individual is also 10.4 and 6.2 percentage points more likely to support revolutionists' organization of public meetings and book publication to express their views. Nevertheless, the political return to education does not extend to participatory acts. Particularly, the better educated are no more likely to vote in elections nor adopt any specific position in the left-right political spectrum.

¹⁷Regarding political interest, political knowledge, and attitudes towards political freedoms, our findings are consistent with studies supporting the 'cause' view of education.⁵ According to this group of studies, there are multiple explanations for the political return to education in terms of political knowledge,

interest, and attitudes. Being regarded as human capital enhancing, education equips individuals with better cognitive ability that enables them to assimilate complicated political information and lowers the opportunity cost of acquiring such knowledge. Besides, individuals staying longer in school are more likely to be exposed to course contents that stimulate the interest in politics. As a result, better-educated individuals tend to possess a good understanding of politics and current affairs as well as a keen interest in such topics. Furthermore, by imparting values of civil liberties and human rights to students, education can shape individuals' perceptions towards political freedoms. Regarding political participatory acts, our results lend support to the 'sorting-mechanism' view by showing that once the endogeneity of education is accounted for, better-educated individuals are no more likely to cast a vote in an election nor adopt any specific position in the left-right political spectrum.⁶ The non-existence of such effects could be explained by two factors. First, in many countries, prior to elections, eligible individuals need to do the voter registration which involves a lot of bureaucratic hurdles (Milligan et al., 2004). By raising the labor market return, education also increases the opportunity cost of time associated with voter registration, thus reducing the probability of participation. Second, it is possible that better-educated individuals might consider voting just an expressive act where one single vote is unlikely to change the outcome of an election; therefore, they are no more likely to vote (Campbell, 2006). These two forces could have counteracted the positive effects of education on political awareness, political interest, and supportive attitudes towards political freedoms, thus leaving participatory acts unchanged. Taken together, our study provides some evidence for the political return associated with education. Despite the non-existent impact on participatory acts, education does cultivate

5 Wolfinger and Rosenstone (1980), Rosenstone and Hansen (1993), Niemi and Junn (1998), Torney-Purta et al. (1999), Galston (2001), Dee (2004), Milligan et al. (2004), Sondheimer

and Green (2010), Mayer (2011) 6 Luskin (1990), Nie et al. (1996), Herrnstein and Murray (1994), Kam and Palmer (2008), Highton (2009), Berinsky and Lenz (2011), Pelkonen (2012), Persson (2013) 18 political interest, promote the acquisition of political knowledge, and foster supportive attitudes towards political freedoms. To put it differently, education may not lead to broader participation among the citizenry but instead improve the quality of political participation, given that politically interested and knowledgeable individuals are the more effective participants in a representative democracy (Lassen, 2005). Therefore, our study further justifies government interventions in the provision and financing of education.

Conclusion

The study contributes to the literature by examining the extent to which educational attainment influences political engagement of individuals. To empirically conduct the analysis, we employ the Role of Government module of the International Social Survey Programme data. To account for the endogeneity of education, we adopt the Instrumental Variable (IV) model by exploiting the plausibly exogenous changes in educational years induced by the compulsory education reforms. The reforms raise the mandatory years of education by one or more years for cohorts born after a given year while those who just missed the age cut-off of the law are not affected. Therefore, individuals may attain different levels of schooling just because they were born a few years apart thus subject to different lengths of mandatory education. In other words, the IV approach can tease out the causal effects of education on political engagement from the extension of the length of schooling for would-be-dropout individuals. Our study reaches the following findings. First, educational attainment is positively associated with individual interest in politics and self-perceived knowledge of politics. Specifically, completing one more year of education raises the individual's interest in politics by 6.7 percentage points and increases the individuals self-

perceived knowledge of politics by 8.5 percentage points. Second, better education individuals are more inclined to possess supportive attitudes towards political freedoms. An additional year of education raises the probability of the individual endorsing the organization of public meetings and marches-demonstrations to protest against the government by 6.0 and 8.0 percentage points, respectively. The individual is also 10.4 and 6.2 percentage points more likely to support revolutionists' organization of public meetings and publication of books to express their views. Finally, the political return to education does not extend to participatory acts in politics. There is little evidence that education influences voting nor political affiliation. Despite the absence of effects on participatory acts by fostering political interest and knowledge, the role of education may not lie with broadening participation among the citizenry but lie with enhancing the quality of political participation. To an extent that a fully informed electorate can improve the quality of democracy, our findings support the Pigouvian subsidies for education to reach a more socially efficient acquisition of education.

Appendix 1

In this study, we employ the International Social Survey Programme (ISSP) which is a cross-national collaboration project where data are collected by individual member countries. The data are then integrated into an international data file and distributed by the GESIS Data Archive for the Social Sciences (Leibniz Institute for the Social Sciences). The ISSP's surveys cover a wide range of topics relevant to social research including citizenship, environment, gender roles, government, etc. For the purpose of our analysis, we employ five waves of the Role of Government module (1985, 1990, 1996, 2006, and 2016) where respondents from each country are asked about their political opinions, attitudes, and behaviors (ISSP-RG). Besides political outcomes, demographic characteristics such as age, gender, marital status, etc. are also available in the module. Drawing from the ISSP-RG, we consider three groups of political outcomes, including (i) degree of interest in and knowledge of politics, (ii) attitudes towards political freedoms, and (iii) participatory acts. To reflect individuals' political interest and knowledge, we construct two variables, Interest in Politics and Knowledge of Politics. These variables are based on respondents' answers to the question about their degree of interest in politics and the self-assessed understanding of important political issues. The responses are placed into a five-point scale with 1 representing the strongest (very) and 5 representing the weakest indicators (not at all). We then compute the variables Interest in Politics and Knowledge of Politics as zero-one indicators taking the value of one if the response was coded 1 or 2, and zero otherwise. To capture attitudes towards political freedoms, we construct four variables, Protesters' Public Meetings, Protesters' Demonstrations, Revolutionists' Public Meetings, and Revolutionists' Book Publications. These variables are based on respondents' perceptions of people/organizations running protests and revolutions. Specifically, in terms of protests, respondents were asked whether protesters should be allowed to:

(i) organize public meetings, and (ii) organize marches and demonstrations. Regarding revolutions, respondents were asked whether revolutionists should be allowed to: (i) organize public meetings, and (ii) publish books. Responses are codified into a four-point scale ranging from 1-definitely to 4-definitely not. Our variables are indicators coded as 1 if the response takes the values of 1 or 2, and zero otherwise. In the third group, participatory acts consist of voting behavior and political affiliation. Voting behavior is measured by an indicator (Vote) that takes the value of one if the respondent voted in the last general election and zero otherwise. Political affiliation is proxied by five zero-one variables, Far-left, Center-left, Center, Right, Far-right. These are indicators for the position in the left-right scale of the party for which the respondent voted. In the political spectrum, the left-wing politics (including the far-left and the center-left) endorses freedom, equality, fraternity, rights, progress, reform, and internationalism while the right-wing politics (including the center-right and the far-right) emphasizes authority, hierarchy, order, duty, tradition, reaction and nationalism (Heywood, 2015). Center (or centrism) refers to a political position in the middle between the left wing and the right wing. Five political affiliation categories are based on the party the respondent voted for and expert judgments from the country-specific parties to convert into the left-right scale (GESIS, 2018).

Reference

1. National Center for Health Statistics (US), & National Center for Health Statistics (US). (1976). Health: United States 1975. US Department of Health, Education, and Welfare, Public Health Service, Health Resources Administration, National Center for Health Statistics.
2. Haggerty, R. J., Roghmann, K. J., & Pless, I. B. (Eds.). (1975). Child health and the community. Transaction Publishers. Harris, D. M., & Guten, S. (1979). Health-protective behavior: An exploratory study. *Journal of health and social behavior*, 17-29.
3. Belloc, N. B., & Breslow, L. (1972). Relationship of physical health status and health practices. *Preventive medicine*, 1(3), 409-421. Remington, R. D., & Schork, M. A. (1970). Statistics with applications to the biological and health sciences. Statistics with applications to the biological and health sciences.
4. American Public Health Association, American Water Works Association, Water Pollution Control Federation, & Water Environment Federation. (1912). Standard methods for the examination of water and wastewater (Vol. 2). American Public Health Association..
5. World Health Organization. (1958). The first ten years of the World Health Organization. World Health Organization. Rosenstock, I. M. (1960). What research in motivation suggests for public health. *American Journal of Public Health and the Nations Health*, 50(3_Pt_1), 295-302.
6. Tanahashi, T. (1978). Health service coverage and its evaluation. *Bulletin of the World Health organization*, 56(2), 295. Regier, D. A., Goldberg, I. D., & Taube, C. A. (1978). The de facto US mental health services system: a public health perspective. *Archives of general psychiatry*, 35(6), 685-693.
7. World Health Organization. (1980). International classification of impairments, disabilities, and handicaps: a manual of classification relating to the consequences of disease, published in accordance with resolution WHA29. 35 of the Twenty-ninth World Health Assembly, May 1976. World Health Organization.
8. National Center for Health Statistics (US), & National Center for Health Statistics (US). (1976). Health: United States 1975. US Department of Health, Education, and Welfare, Public Health Service, Health Resources Administration, National Center for Health Statistics.
9. Haggerty, R. J., Roghmann, K. J., & Pless, I. B. (Eds.). (1975). Child health and the community. Transaction Publishers. Harris, D. M., & Guten, S. (1979). Health-protective behavior: An exploratory study. *Journal of health and social behavior*, 17-29.
10. Belloc, N. B., & Breslow, L. (1972). Relationship of physical health status and health practices. *Preventive medicine*, 1(3), 409-421. Remington, R. D., & Schork, M. A. (1970). Statistics with applications to the biological and health sciences. Statistics with applications to the biological and health sciences.
11. American Public Health Association, American Water Works Association, Water Pollution Control Federation, & Water Environment Federation. (1912). Standard methods for the examination of water and wastewater (Vol. 2). American Public Health Association..
12. World Health Organization. (1958). The first ten years of the World Health Organization. World Health Organization. Rosenstock, I. M. (1960). What research in motivation suggests for public health. *American Journal of Public Health and the Nations Health*, 50(3_Pt_1), 295-302.
13. Tanahashi, T. (1978). Health service coverage and its evaluation. *Bulletin of the World Health organization*, 56(2), 295. Regier, D. A., Goldberg, I. D., & Taube, C. A. (1978). The de facto US mental health services system: a public health perspective. *Archives of general psychiatry*, 35(6), 685-693.
14. World Health Organization. (1980). International classification of impairments, disabilities, and handicaps: a manual of classification relating to the consequences of disease, published in accordance with resolution WHA29. 35 of the Twenty-ninth World Health Assembly, May 1976. World Health Organization.