



PERIODIC MEDICAL CHECKUP AMONG HEALTH WORKERS: A DESCRIPTIVE CROSS-SECTIONAL SURVEY AT A TEACHING HOSPITAL IN GHANA

¹Surazu, B., ^{*2}Muktar, A. M., ³Salifu, A.

¹University for Development Studies, School of Public Health, Tamale, Ghana

²University for Development Studies, School of Public Health, Tamale, Ghana

³University for Development Studies, School of Public Health, Tamale, Ghana

*Corresponding Author's Email: mabdulmuiz@uds.edu.gh

Abstract

This study aimed at assessing the prevalence of periodic medical checkup by health professionals at the Tamale Teaching Hospital. This was a cross-sectional study with a quantitative research approach. Three hundred (300) health care personnel, including nurses, doctors and medical laboratory scientists were selected using a convenience sampling method. Data was collected using self-administered questionnaire, with questions classified under demographics, knowledge, perception and practice. Data processing was carried out using Microsoft Excel. Data was checked, cleaned and analyzed using the Statistical Package for Social Science, SPSS version 21. Ninety percent (90%) of participants were highly knowledgeable with regards to routine medical checkup as a very important practice among health professionals. Similarly, participants exhibited a positive perception towards medical checkups. 98.7% said medical checkups are important whilst 99.0% said they would encourage the practice of periodic medical checkup. Prevalence of periodic medical checkup was 91.0%. Most of the participants' recommended that medical checkups be covered by health insurance whilst health facilities should also ensure an annual examination of its staff. There is a high prevalence of medical checkup among health care personnel at the teaching hospital under study, there is also a positive attitude as well as a high level of knowledge regarding the practice.

Keywords: Medical Checkup, Examination, Knowledge, Health Workers, Perception and Practice

Introduction

Routine medical checkup has been an integral part of medical practice for centuries, notwithstanding the lack of consensus on its significance in health promotion and illness prevention (Boulware et al., 2007). In 1861, the concept of routine medical checkup was proposed by Dorbell as a measure to maintain optimum health and ward off conditions such as tuberculosis. In the early 1920s through to 1970, the American Medical Association repeatedly advocated for an annual medical checkup to maintain good health. Accordingly, an annual health check close to one's birthday became a routine for many Americans (Chacko and Anderson, 2007).

Medical checkups commence during fetal life. Fetuses are examined to detect congenital malformation in-vitro. Further assessment occurs at the time of birth, where newborns are examined for birth defects. As such, medical checkups should continue from childhood, through to adolescence and adulthood. Unfortunately, this is not the case. Most individuals, especially in Africa, do not attach

much significance to medical checkups, Medical examinations are only carried out during times of ill health and pre-employment (Of et al., 2017).

A Routine Medical Checkup (RMC) is an aspect of preventive medicine (Kamath & Ganguly, 2020), which involves the medical assessment of an apparently healthy individual, carried out at regular intervals by health personnel, to enhance the early detection of risk of medical conditions (Han, 1997). RMC provides an asymptomatic individual the opportunity to have a health assessment with a physician. It is carried out with the hope of detecting conditions that would have gone unnoticed. It involves a general physical assessment, laboratory investigation of body fluids such as blood and urine samples, radiologic investigations such as X-rays, ultrasounds and electrocardiograms (Kamath & Ganguly, 2020).

In some western countries such as Germany, the statutory health insurance, which covers about 90% of the German population states that, regular medical examination

must be carried out in all primary health care facilities. German citizens above the age of 35yrs, who are under the statutory health insurance have the right to a medical examination once every two years for the early detection and risk factors of diabetes, cardiovascular and renal conditions (Hoebel et al., 2013). Contrastingly, the practice of RMC is poor in developing countries, despite an increasing prevalence of chronic diseases (Danquah et al., 2020). Some factors which determine the practice of RME includes advanced age, economic status of the individual, marital status, educational level, gender, nature of one's job and the health status of the individual (Bjerregaard et al., 2017).

A study conducted on RME among traders in Nigeria reported that, there is a high level of awareness of RME among the participants of the study, however, a statistically insignificant number actually practice RME. Majority of the traders who practiced RME were in the advanced age bracket of 40-49 years (Eke et al., 2012). A similar study conducted among traders at the Kaneshie market in Ghana revealed adequate knowledge about RME, practice was however reported to be poor (Appiah & In, 2019). This study aimed at assessing the prevalence of periodic medical checkups by health professionals at the Tamale Teaching Hospital.

Materials and Methods

Study Design and Setting

A cross-sectional study was conducted among health care personnel, nurses, doctors and MLS at a teaching hospital in Ghana. A total of 300 participants took part in the study, comprising 175 nurses, 83 Medical Doctors and 42 MLS. The formula used to calculate the sample size was $n = \frac{Z^2pq}{e^2}$, Z^2 is the desired level of confidence (standard value of 1.96) e^2 is desired level of precision or level of acceptable error $=0.05p$ is the proportion of RME in the population from a previous study. 68.1% prevalence of RME at in Tema Community 20 (Of et al., 2017 and Q is 1-p. This formula was used because of the difficulty involved in getting the size of the total population. The estimated sample size was 335 participants. However, the researcher and his team were able to recruit 300 participants.

Data Collection and Processing

Self-administered questionnaire was developed using google forms and distributed via various social media platforms in the hospital. The questionnaire was divided into four categories; demographics, knowledge, perception and practice. The demographics section solicited information such as age, which was categorized, sex, reli-

gion, marital status and profession. There were a number of questions, mostly close ended, under the other sections which were directed towards those objectives. The questionnaire was pre-tested and appropriate corrections made. Face validity was further confirmed by experts in the field of nursing.

Data Processing and Analysis

Data collection lasted for eight weeks, with two research assistants aiding the principal investigator. Data was processed using Microsoft excel, checked and analyzed using Statistical Package for Social Sciences, (SPSS) version 21.

Results

Demographics

Age was captured as a categorical variable, ranging from 20-30, 31-40, 41-50 and 51-60yrs. Majority of the participants, 67.3% were between the ages of 20-30yrs, and the least represented age range was 51-60, with only 0.3% of the participants. 65.7% of the participants were males, whilst the remaining 34.3% were females. Majority of the respondents, 56.0% were single, 43.7% were married, whilst 0.3% had lost their partners. The predominant religion was Christianity, making up 55.7%, Islam had 43.3% whilst the African traditional religion and agnostic beliefs made up the remaining percentage.

Majority of the participants were nurses, comprising 58.3% of the respondents, medical doctors made up 27.7%, whilst the MLS 14.0%. The figures displayed in Table 2 illustrates the responses of participants with regard to the definition of RME. 53.3% of the participants strongly agreed with the definition of RME provided, 42.3% agreed, 0.3% were neutral, 0.7 disagreed, whilst 3.3% strongly disagreed.

Next on the list of questions to assess level of knowledge was the question "RME is important for asymptomatic adults". 126 representing 42% of the participants strongly agreed that RME is important for asymptomatic adults. 49.3% agreed, 2.3% were not sure, another 2.3% disagreed, whilst 4% strongly disagreed that RME is important for asymptomatic adults.

Table 1. Participants Demographic Information

Demographic	Freq	Percentage
AGE		
20-30	202	67
31-40	93	31
41-5	4	1
51-60	1	0
MARITAL STATUS		
Single	168	56
Married	31	44
Widowed	1	0.3
RELIGION		
Islam	130	43
Christianity	167	56
Traditional	1	
Agnostic		0
GENDER		
Male	197	34
Female	103	66
PROFESSION		
Nurse	175	58
Medical doctor	83	28
MLS	42	14

Table 2: Definition of Routine Medical Examination

Response	Frequency	Percentage
Strongly Agree	160	53.3
Agree	127	42.3
Neutral	1	0.3
Disagree	2	0.7
Strongly Disagree	10	3.3

Table 3: Responses on Whether RME is Important for Asymptomatic Adults

Response	Frequency	Percentage
Strongly Agree	126	42.0
Agree	148	49.3
Not Sure	7	2.3
Disagree	7	2.3
Strongly Disagree	12	4.0

Table 4: Responses on Whether RME Helps to Establish a Health Baseline

Response	Frequency	Percentage
Strongly Agree	129	43.0
Agree	155	51.7
Neutral	2	0.7
Disagree	2	0.7
Strongly Disagree	10	3.3

Table 5: Responses on Assessment of Entire Body's Sys-

Response	Frequency	Percentage
Strongly Agree	155	52
Agree	131	44.4
Disagree	2	1
Strongly Disagree	12	4

Table 6: Responses on Annual Cervical Smear by Females and PSA by Males

Response	Frequency	Percentage
Strongly Agree	115	38.3
Agree	150	50.0
Not Sure	21	7
Disagree	5	1.7
Strongly Disagree	8	2.7
Non Response	1	0.3

Table 7: Early Detection of Diseases Prevents Complications

Response	Frequency	Percentage
Strongly Agree	190	63
Agree	92	31
Not Sure	2	1
Disagree	1	0.3
Strongly Disagree	13	4

Table 8: Counseling and Health Education Essential in RME

Response	Frequency	Percentage
Strongly agree	135	45.0
Agree	140	46.7
Not sure	9	3.0
Disagree	5	1.7
Strongly disagree	10	3.3

Table 9: Is RME Necessary?

Response	Frequency	Percentage
Yes	296	98.7
No	1	0.3
No Response	3	1

Table 10: RME is Only Necessary for People Who are Sick

Response	Frequency	Percentage
Strongly agree	5	2
Agree	1	.3
Not sure	1	.3
Disagree	105	35
Strongly disagree	186	62

Table 11: RME Prevents Nosocomial Infections

Response	Frequency	Percentage
Strongly agree	100	33
Agree	146	49
Not sure	15	5
Disagree	29	10
Strongly disagree	9	3

Table 12: RME Should be Done Annually.

Response	Frequency	Percentage
Strongly agree	45	15
Agree	166	55
Not sure	36	12
Disagree	45	15
Strongly disagree	6	2

Table 13: RME Should be Covered by NHIS

Response	Frequency	Percentage
Strongly agree	89	30
Agree	152	51
Not sure	0	0
Disagree	22	7
Strongly disagree	37	12

Table 14: Hospital Ensure Annual Checkup of All Staff

Response	Frequency	Percentage
Strongly agree	176	59
Agree	105	35
Not sure	0	0
Disagree	4	1
Strongly Disagree	15	5

Table 15: Support of RME

Response	Frequency	Percentage
Yes	297	99
No	3	1

Table 16: Only Individuals Above 40yrs Should Practice RME

Response	Frequency	Percentage
Strongly agree	9	3
Agree	8	3
Not sure	6	2
Disagree	154	51
Strongly disagree	120	40

Table 17: Practice of RME

Response	Frequency	Percentage
Yes	273	91
NO	23	8
No Response	4	1

Table 18: Types of Checkups Undergone

Examination	Frequency	Percentage
General Exam	181	60
Blood Pressure	41	14
Visual Exam	28	9
Dental Exam	9	3
Others	22	10
Non- Response	19	6

Table 19: When Last RME was Done

Response	Frequency	Percentage
A month ago	72	24
6months ago	18	
A year ago	79	26
Last 5yrs	54	18
Can't remember	69	23
No response	8	3

Table 20: Reasons why RME was Done

Response	Frequency	Percentage
For personal reasons	175	58
Employment	60	20
Follow up	28	9
Travel	10	3
School	5	2
Marriage	6	2
No response	16	4

Table 21: How Often RMC Should be Conducted

Response	Frequency	Percentage
Monthly	28	9
Every 6months	169	56
Annually	85	28
Every 5yrs	3	1
Others	7	2
No response	8	3

Table 22: What Inhibits the Practice of RMC?

Response	Frequency	Percentage
Not sick	47	15.7
Financial constraints	121	40.3
Not necessary	50	16.7
Time constraints	74	24.7
Others	8	3

Table 23: Will you Encourage the Practice of RME?

Response	Frequency	Percentage
Yes	297	99
No	1	0.3
No response	2	1

Table 24: Do you Conduct Monthly Breast Self-Examination?

Response	Frequency	Percentage
Yes	52	17
No	170	57
Not regularly	62	21
No response	16	5

Discussion

A total of 300 participants were recruited for the study, representing 90% of the estimated sample size. Majority of the participants, 58.3% were nurses, this is normal as nurses form the majority of the health care force, followed by medical doctors which constituted 27.7% whilst the MLS constituted 14.0%.

The male gender dominated the study with 65.7%. This is partly due to the male dominated medical and medical laboratory professions. However, the method employed to collect data, where the researchers collected contacts of participants for them to answer the questionnaire also contributed to the male dominance of the study. 91.3% of the male population have ever undergone routine medical checkup compared to 94.0% of females. The female gender undergoes routine medical checkups more than their male counterparts, as was also reported by (Eke et al., 2012), where 39.4% of females regularly examine their health compared to 29.4% of males. However, studies from Australia reported no difference in medical examination between males and females (Brunner-Ziegler et al., 2013).

56% of the participants were single at the time of data collection. This might be due to the fact that, most of the participants, 67.3% are with the ages of 20-30yrs. With regard to the practice of medical checkups, 89.8% of participants who were single have ever undergone a medical checkup, compared to 95.3% of the married population. Married couples tend to undergo routine medical check-

ups compared to the single population, this was also reported by Ali et al. (2012) and Appiah & In (2019).

For religious affiliations, 93.8% of Muslims have ever undergone medical checkup, compared to 91.0% of Christians.

The first objective of the study was to assess the level of knowledge of participants regarding RME. Series of questions were asked and analyzed.

The first question that was put before participants to assess their knowledge was the definition of RME, which was defined as the process of assessing an individual's state of health so as to detect, treat and prevent illnesses. 56.6% of nurses strongly agreed with the definition, 49.4% of doctors strongly agreed whilst 47.6% of medical laboratory scientists strongly agreed. 39.4% of nurses agreed, 45.8% of medical doctors agreed, whilst 47.6% of laboratory scientists agreed. Cumulatively, 95.6% of the participants either strongly agreed or agreed with the definition. This is similar to a study conducted in Nigeria, where 100% answered yes to the same definition [13]. This is however comparatively higher than that reported by Appiah & In (2019).

Next on assessing knowledge was the question, health checkup is important for asymptomatic adults. 40%, 45.8% and 42.9% of nurses, doctors and medical laboratory scientists respectively strongly agreed, whilst 48.6%, 50.6% and 50.0% of nurses, doctors and laboratory scientists respectively agreed. Cumulatively, 91.3% of the participants either strongly agreed or agreed to the statement that, medical checkups are necessary for asymptomatic adults. This is similar to that reported by Appiah & In (2019), where 92.1% also strongly agreed or agreed to the assertion that, medical checkup is important for asymptomatic adults.

Periodic health checkups help to establish a health baseline was the next question put before participants to assess their knowledge. 42.8%, 49.4% and 33.3% of nurses, doctors and laboratory personnel respectively strongly agreed to the statement, whilst 52.2% of nurses, 45.8% of doctors and 61.9% of laboratory personnel agreed to the statement. Cumulatively, 94.5% of participants either strongly agreed or agreed to the statement. This is similar to that reported by Appiah & In (2019), where 96.0% either strongly disagreed or agreed to the statement.

General medical checkups should involve an assessment of one's entire body system. This was the next question under the knowledge category to which 56.0% of nurses, 50.6% of doctors and 35.7% of laboratory staff strongly agreed. 40%, 43.4% and 43.7% of nurses, doctors and laboratory scientists respectively agreed to the statement. Cumulatively, 95.3% of participants either strongly agreed or agreed to the statement. Similar results were

reported by Appiah & In (2019).

Females above 30yrs and males above 40yrs should have cervical smear and PSA done respectively. 37.1%, 44.6% and 31.7% of nurses, doctors and laboratory staff respectively strongly agreed to the statement, whilst 49.7%, 47.0% and 58.5% of nurses, doctors and laboratory staff respectively agreed to the statement. Cumulatively, 88.3% of participants either strongly agreed or agreed to the statement. This is higher than that reported from a study conducted among medical students, which reported 61% (Liu et al., 2016).

Early detection of diseases such as hypertension and diabetes can prevent complications later in life. 94% of participants either agreed or strongly agreed to this statement. 65.9%, 69.9% and 42.9% of nurses, doctors and laboratory scientists strongly agreed, whilst 30.1%, 25.3% and 45.2% of nurses, doctors and laboratory staff agreed to the statement.

Counseling and health education is essential in health checkup. 44.0% of nurses, 54.2% of doctors and 31.7% of laboratory scientists strongly agreed to this assertion, whilst 48.0%, 39.8% and 56.1% of nurses, doctors and laboratory personnel respectively agreed. Accumulatively, 91.6% of participants either agreed or strongly agreed to this statement. According to a study conducted by [8], this assertion was rated “very important” and ranked as the second most important by participants.

The study finds a high level of knowledge among health care personnel, nurses doctors and medical laboratory scientists. More than 90% of the participants either agreed or strongly agreed to all questionnaire items related to knowledge. This finding is similar to that of several other studies such as Ojong et al. (2020), who reported knowledge prevalence of 92.8% among health personnel in a teaching hospital in Nigeria. This finding is however considerably higher than that reported from a study in Saudi Arabia, where 69.6% of the participants are reported to have adequate knowledge about medical checkups (Liu et al., 2020). There were no significant differences between the three professions.

The next objective of the study was to assess the perception of health care personnel towards routine medical checkup. Series of questions were asked to assess this objective. First on the list was to elicit the views of participants as to whether medical checkups are necessary. 99.7% of participants responded yes, that medical checkups are important. This was considerably higher than that reported from Saudi Arabia, where 88.9% said medical checkups are important (Liu et al., 2020).

Next on perception was the question, medical checkups are only necessary for people who are sick. A cumulative 97.0% of participants either disagreed or strongly disagreed to the statement. 56.5%, 31.7% and 11.8% of nurs-

es, doctors and laboratory personnel respectively strongly disagreed, whilst 36.8%, 28.0% and 42.9% of nurses, doctors and laboratory personnel disagreed. The results of this study was considerably higher than that reported by Eke et al. (2012), where 36.4% said medical checkups are only necessary for people who are sick.

Medical checkups help to prevent nosocomial infections among health personnel. 30.3%, 42.2% and 29.3% of nurses, doctors and laboratory staff respectively strongly agreed, whilst 49.7%, 45.8% and 51.2% of nurses, doctors and laboratory staff respectively agreed to the assertion. Cumulatively, 82.0% of participants either agreed or strongly agreed to that statement. This finding is higher than that reported by Ojong et al. (2020), where in a similar study among health care workers in a teaching hospital in Nigeria, 45.9% said health checkups reduce the incidence of nosocomial infections.

When asked about the frequency at which health checkups should be done, 13.2%, 20.7% and 11.9% of nurses, doctors and laboratory personnel respectively strongly agreed that, medical checkups should be done yearly, whilst 57.5%, 54.9% and 50.0% of nurses, doctors and laboratory personnel respectively agreed that, medical checkups should be done yearly. Cumulatively, a total of 70.3% of the respondents believed medical checkups should be conducted annually. This finding differs from that of Eke et al. (2012), where 59.9% of respondents felt medical checkups should be conducted monthly.

Participants were asked whether they wanted medical checkups to be captured under the National Health Insurance Scheme (NHIS). 32.0%, 32.5% and 14.3% of nurses, doctors and medical laboratory scientists respectively strongly agreed that, health checkups be captured under the NHIS, whilst 48.0%, 58.2% and 50.7% of MLS agreed. Cumulatively, 80.3% of participants either agreed or strongly agreed that, health checkups be captured under the NHIS. Several studies, including this current study reported cost of financial constraints as a major obstacle to the practice of health checkups. In their study, Appiah & In (2019) reported that, 41.6% of participants cited cost as the main reason for not undergoing health checkups. Similarly, 41.3% of the participants of this study cited cost as the main reason for not undergoing medical checkups. Similarly, 93.6% of participants either agreed or strongly agreed that, the hospital should conduct yearly medical checkups for all staff. This clearly indicates a positive attitude or perception of participants towards health checkups.

When asked whether or not they support the practice of regular health checkups, 99.0% of participants responded in the affirmative. This is further cemented by the finding that, 91.3% of participants believed health checkups are necessary for everyone, and not just the elderly

or those above 40yrs. This finding differs from that reported by Ojong et al. (2020) where only 58.7% said health checkups should be undertaken by all age groups. In a related finding, 99% of participants in this study said they will encourage their colleague health workers to practice periodic medical checkup.

The final objective of the study was to assess the practice of Routine Medical Checkup among health care personnel. To this effect, a simple question put before participants; “have you ever undergone routine medical checkup?” 94.2%, 89.2% and 90.5% of nurses, doctors and MLS responded yes, they have ever undergone medical checkup. Cumulatively, 91.0% of participants have ever undergone medical checkup. This is considerably higher than reported from Saudi Arabia, 22.5% (Al-Kahil et al., 2020), Nigeria, 46% (Ojong et al., 2020) Tema Community 20, 68.1% (Bjerregaard et al., 2017) Kaneshie market, 46.7% (Appiah & In, 2019), India 36% (Al-Kahil et al., 2020) as well as Austria, 41.8% (Al-Kahil et al., 2020). However, when participants were asked whether they conduct monthly breast self-examination, only 17.3% responded yes, whilst 20.7% said not regularly. Only 36.8% of female participants conduct monthly breast examination. This finding though one would have expected a high prevalence rate is still higher than that reported among medical students in Kenya, with BSE prevalence rate of 19.2% (Brunner-Ziegler et al., 2013).

Participants were asked to indicate the type of checkup they had undergone. General examination was the highest checkup undergone with 64.6%. This was similar to that reported from Nigeria, where 61.8% of respondents underwent general examinations (Eke et al., 2012), but slightly higher than that reported by Appiah & In (2019) [10] where 52.2% underwent general examination. This might be attributed to high level of knowledge exhibited by the participants. Blood pressure examination was undergone by 14.6%. This is in contrast to that reported by Ojong et al. (2020), where 61.3% had blood pressure checkups. This may be due to the fact that blood pressure examination is included in general medical checkups. Other checkups were Random Blood Sugar, Cholesterol examination, dental and visual examinations, hepatitis, and cervical examinations.

Participants were asked to indicate the last time they went for a medical checkup. 56.3% had undergone medical checkup within the previous year. This is slightly higher than that reported by Ojong et al. (2020) where 44.9% underwent medical checkup within the past year.

Majority of the participants (58.3%), had undergone medical checkups for personal reasons. This might be due to the fact that most of the participants regard medical checkups as important, due to their level of knowledge.

This finding was higher than that reported by Bjerregaard et al. (2017), where 35.4% of participants went for medical checkups for personal reasons as well as that reported by Ali et al. (2012) 40.7%. It was however lower than that reported from Saudi Arabia, 77.5% (Ali et al., 2012). 21% underwent medical checkups for employment, whilst 9.9% as a follow up on treatment. This finding differs significantly from that of [16], where 64% percent undergo medical checkups only when they are sick.

When asked how often individuals should undergo medical checkups, majority of the patients (56.3%) recommended every six months, whilst 28.3% said annually. This was in contrast to that reported by Eke et al. (2020), who reported that, 59.9% of respondents said individuals should undergo medical checkups monthly whilst 12.4% of their participants did not know how often medical checkups should be done.

The major obstacle that impedes the practice of periodic medical checkup is financial constraint, 40.3%, followed by time constraints, 24.7%. This was similar to the study conducted at Kaneshie market, where 41.6%, 40.7% and 39.8% respectively cited high cost of service, time constraints and not being sick enough to be major challenges towards the practice of RMC (Appiah & In, 2019). A handful of the participants cited issues such as privacy and confidentiality.

Conclusion and Recommendation

Majority of the participants exhibited a high level of knowledge and positive attitude towards periodic medical checkup. Practice of medical checkup was high among participants, except for monthly breast self-examination, which surprisingly was on the lower side.

The study recommends stake holders to consider the inclusion of periodic medical checkups in the NHIS. Health facilities are also recommended to conduct, at least, yearly medical checkups for their staff. Health care personnel, most especially females are encouraged to conduct regular monthly self-breast examination.

Acknowledgement

Authors would like to thank the Research and Development Unit of the Tamale Teaching Hospital and all health workers, most especially, nurses, doctors and medical laboratory scientists for their contributions.

Ethical Approval

The study received ethical approval from the Tamale Teaching Hospital Ethics Review Board, with approval reference number THERB-22-217. Also, permission to conduct the study was granted by the Head of research department at the Sagnerigu Municipal Assembly. We

also obtained informed consent from all participants in the study.

Competing Interest

There are no competing interests associated with this study as the study was self-financed.

References

- Ali, M. K., McKeever Bullard, K., Imperatore, G., Barker, L., & Gregg, E. W. (2012). Characteristics associated with poor glycemic control among adults with self-reported diagnosed diabetes—National Health and Nutrition Examination Survey, United States, 2007–2010. *MMWR Morb Mortal Wkly Rep*, 61(2), 32-37.
- Al-kahil, A. B., Khawaja, R. A., Kadri, A. Y., Abbarh, S. M., Alakhras, J. T., & Jaganathan, P. P. (2020). Knowledge and Practices Toward Routine Medical Checkup Among Middle-Aged and Elderly People of Riyadh. *Journal of Patient Experience* 7(6), 1310–1315.
- Appiah, H. K., & In, L. (2019). University of Ghana <http://ugspace.ug.edu.gh>.
- Bjerregaard, A., Maindal, H. T., Henrik, N., & Sandbæk, A. (2017). Patterns of attendance to health checks in a municipality setting: the Danish 'Check Your Health Preventive Program'. *Preventive Medicine Reports*, 5, 175–182.
- Boulware, L. E., Marinopoulos, S., Phillips, K. A., & Hwang, C. W. (2007). *Annals of Internal Medicine*, 146(4), 289-300.
- Brunner-ziegler, S., Rieder, A., Stein, K. V., Koppensteiner, R., Hoffmann, K., & Dorner, T. E. (2013). Predictors of participation in preventive health examinations in Austria. *BMC Public Health*, 13(1), 1-9.
- Chacko, K. M., & Anderson, R. J. (2007). The annual physical examination: important or time to abandon?. *The American Journal of Medicine*, 120(7), 581-583.
- Danquah, E. P. B., Agyemang, S. A., Amon, S., & Aikins, M. (2020). Routine medical and dental examinations: A case study of adults in Tema community 20 in Ghana. *International Journal of Health Promotion and Education*, 58(6), 320-332.
- Eke, C. O., Eke, N. O., Joe-Ikechebelu, N. N., & Okoye, S. C. (2012). Perception and practice of periodic medical checkup by traders in South East Nigeria. *Afri-medical Journal*, 3(2), 24-29.
- Han, P. K. J. (2015). Historical Changes in the Objectives of the Periodic Health Examination. *Annals of internal medicine*, 127(10), 910-917.
- Hoebel, J., Richter, M., & Lampert, T. (2013). *Social Status and Participation in Health Checks in Men and Women in Germany*. 110(41), 679–685. <https://doi.org/10.3238/arztebl.2013.0679>
- Of, A., Medical, R., Among, D. E., Tema, A. I. N., Priscilla, E., & Danquah, B. (2017). University of Ghana <http://ugspace.ug.edu.gh>.
- Kamath, V., & Ganguly, S. (2020). Are Periodic Health Checkups Useful or Necessary? *APIK Journal of Internal Medicine*, 8(2), 51.
- Kimani, S. M., & Muthumbi, E. (2008). Breast self examination and breast cancer: Knowledge and practice among female medical students in a Kenyan university. *Annals of African Surgery*, 3, 37-42.
- Liu, J., Ning, Z., Song, S., Miao, L., Zhang, P., Wang, X., ... & Zhou, Q. (2016). High prevalence of vitamin D deficiency in urban health checkup population. *Clinical Nutrition*, 35(4), 859-863.
- Ojong, I. N., Nsemo, A. D., & Aji, P. (2020). Routine Medical Checkup Knowledge , Attitude and Practice among Health Care Workers in a Tertiary Health Facility in Calabar , Cross River State , Nigeria. 12(8), 27–37.
- Schuster, B. L., Editor, A., Chacko, K. M., & Anderson, R. J. (2007). Office Management: General Internal Medicine- The Annual Physical Examination : Important or Time to Abandon? 581–583. <https://doi.org/10.1016/j.amjmed.2006.07.046>
- Varshini, A., Rani, S. L., & Brundha, M. P. (2020). Awareness of annual doctor checkups among general population. *Drug Invention Today*, 14(2).