



# Physical Exercise Among Traders in the Commerce District of the City of Bouake in a Context of Rising Non-Communicable Diseases

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**Abstract:** *Background:* Physical inactivity is one of the major risks of morbidity and mortality associated with the development of chronic diseases. 6-10% of global mortality associated with non-communicable diseases is related to physical inactivity. Unlike in Western countries, research on the practice of physical activity by populations does not receive enough attention from the scientific community in Africa. To bridge this gap and draw people's attention to the need for physical activity, the present study is carried out. *Methods:* This cross-sectional analytical study conducted from April 1 to June 30, 2019 among shopkeepers in the commercial district of the city of Bouaké aims to promote physical activity among subjects exposed to NCDs due to their occupational sedentary lifestyle. Merchants were recruited on the basis of exhaustive sampling during the study period. *Results:* A group of 474 shopkeepers were surveyed by means of a questionnaire. 16.4% of the shopkeepers had been made aware of the need for physical activity by a health professional, and 32.5% were physically active. The positive impact of physical activity was unanimously recognized (91.6%), with benefits for the heart (70.9%), weight (66.9%), brain (31.4%) and lung (28.7%). There was a statistically significant relationship ( $p < 0.05$ ) between physical activity and gender, age, education and marital status. *Conclusion:* Recognition of the health benefits of physical activity does not automatically lead to its practice by retailers, which raises the issue of the integration necessary for the effective application of certain health-promoting practices.

**Keywords:** Physical Activity, Traders, Practice, Côte d'Ivoire

## 1. Introduction

Non-communicable diseases (NCDs) accounted for about 70% of all deaths globally in 2015 and more than 80% of these premature deaths were in low-income and middle-income countries (LMICs) [1, 2]. These diseases continue to be a global public health challenge faced by both developed and Low and Middle-Income Countries (LMICs), regardless of their economic and health systems [3, 4]. In 2016, Member States of the World Health Organization (WHO) developed and implemented national action plans for NCDs in line with the Global action plan for the prevention and control of NCDs (2013–2020) [3, 5, 6]. Globally, NCDs account for 40 million deaths annually and approximately \$7.8 billion in losses [3, 7, 8]. In association with globalization and technological advancements, the burden of NCDs increases and affects the lives, economies, and healthcare systems of both advanced and lower sourced countries [3, 9]. Shreds of evidence show that NCDs share common risk factors such as an unhealthy diet, unhealthy lifestyles, customary alcohol use, frequent tobacco use, and physical inactivity [3, 7, 8, 10]. According to WHO, physical inactivity is the fourth leading risk factor for death worldwide [11, 12]. Inactivity exposes an individual to a similar health risk as smoking and obesity [11, 13]. Strong evidence for the therapeutic use of physical activity in several chronic diseases continues to emerge; including but not limited to, metabolic syndrome-related disorders, heart and pulmonary disease, rheumatoid and osteoarthritis, cancer and mental health disorders such as depression [11, 14–18]. For this reason, physical activity has been called ‘the miracle cure’ [11, 19].

Unlike in Western countries, the issue of physical activity is not sufficiently addressed in sub-Saharan Africa. To fill this gap and help draw the attention of health professionals and political authorities to the need to better promote this practice, we proposed to conduct a study on this theme among shopkeepers in the commerce district of the city of Bouaké. With a population of 83271 according to the 2021 general population and housing census (RGPH), Bouaké is the second largest city in Côte d'Ivoire in demographic terms [20]. Merchants are more likely to be sedentary, as their activities require them to sit for long periods of time.

## 2. Method

### 2.1. Type of Study, Study Setting and Sampling

We conducted an analytical cross-sectional study from April 1 to June 30, 2019 among shopkeepers in the commerce district of the city of Bouaké. In addition to concentrating the largest gathering of administrations, the commerce district is the best addressed in the city.

Inclusion criteria: Any person carrying out a commercial activity in a store or in the open air (stall) present at the time of our visit, staying in Bouaké for at least six months and having agreed to take part in the study.

Non-inclusion criteria: Anyone under 18 years of age

and/or contract workers (security guard, surface technician).

The sampling techniques used were purposive sampling and snowball sampling [21]. A census was carried out which consisted of using an identified shopkeeper to find another person working in the same shop. The location of this person was provided by the first trader identified. This was done until the shopping district was saturated. Saturation was evidenced by meeting the people already interviewed [21]. Thus, 474 people were interviewed. The data collection method was the questionnaire method. This was a newly developed questionnaire in the absence of any pre-existing questionnaire on the subject. A one-week pilot study enabled us to gain an insight into the conditions under which retailers carry out their activities, and to adapt the questions to these conditions. The questionnaire was anonymous, structured and included questions on:

1. The socio-demographic characteristics of the traders;
2. Their personal medical history and lifestyle;
3. Reasons for taking or not taking part in physical activity;
4. Their knowledge of the health benefits of sport.

### 2.2. Independent Variables

Independent variables are socio-demographic characteristics.

### 2.3. Dependent Variables

The variable to be explained is physical activity.

### 2.4. Cross-Tabulation of Variables

The data collected were analyzed using Epi info.3.5.1 and SPSS 20.0 software. A univariate analysis of proportions was performed, using the Chi2 method and a significance level of 5%.

Data were entered and processed using SPSS.20 software. Quantitative variables were expressed as positional parameters and qualitative variables as proportions.

### 2.5. Ethical Considerations

We protected the confidentiality of the information provided by assigning an anonymous identification code to each survey form. Respondent participation was voluntary and obtained after informed consent and verbal agreement.

### 2.6. Administratives Authorisations

The field survey required authorisation from the Gbêkê Regional Health Directorate.

## 3. Results

### 3.1. Sociodemographic Characteristics, Lifestyle and Medical History (Table 1)

Subjects had an average age of 36 and were male in 74.3% of cases (sex ratio=2.9). The type of business was stores in 84% of cases. The type of articles sold by the shopkeepers

was household appliances, followed by clothing (31.2% and 27.6% of cases). In 42.2% and 26.4% of cases respectively, the retailers were secondary or primary school graduates. The

subjects lived in couples in 59.9% of cases, and had no personal means of transport in 50.8% of cases.

**Table 1.** Socio-demographic characteristics- Lifestyle and medical history.

	Categories	Total	Percentage (%)
Age (n=474) (years old)	19-39	306	63.1
	40-79	168	35.4
Gender (n=474)	Male	352	74.3
	Female	122	25.7
Type of Business (n=474)	Shop	398	84
	Display	76	16
	Domestic appliances	148	31.2
	Clothing	131	27.6
Type of Goods sold (n=474)	Foodstuffs	48	10.1
	Cosmetics	46	9.7
	Office equipments	27	5.7
	Others	74	15.6
	nothing	97	20.5
School educational level (n=474)	Elementary	126	26.6
	Secondary	200	42.2
	Higher	51	10.8
Marital status (n=474)	In couple	284	59.9
	Not in couple	190	40.1
Personal means of transportation (n=474)	yes	233	49.2
	No	241	50.80
Acohol Consumption (n=474)	yes	425	10.3
	No	49	89.7
Tobacco Consumption (n=474)	yes	71	15.2
	No	403	84.8
Care taken towards Food Quality (n=474)	yes	214	45.1
	No	260	54.9
Rest day in the week (n=474)	yes	332	70
	no	142	30
High Blood Pressure (n=474)	yes	18	3.8
	no	456	96.2
Diabetes mellitus (n=474)	yes	5	1.1
	no	469	98.9
Asthma (n=474)	yes	16	3.4
	no	468	96.6
BMI (kg/m <sup>2</sup> ) (n=474)	< 18.5	6	1.3
	[18.5-24.9]	244	51.5
	[25-29.9]	185	39
	≥ 30	39	8.2

They declared that they did not consume alcohol or smoke in 89.7% and 84.8% of cases respectively. They reported not paying attention to the quality of their food in 56.9% of cases. They usually travelled by motorized means (car and/or moped) in 66.3% of cases, and had one day off during the week in 70% of cases, during which they carried out no activity in 61.8% of cases. The patients were neither hypertensive in 96.2% of cases, nor diabetic or asthmatic in 96.2%, 98.9% and 96.6% of cases respectively. Traders had a normal body mass index (BMI) in 51.5% of cases.

### 3.2. About Exercise (Tables 2 and 3)

Subjects had been made aware of the need for physical activity. The media was the main channel for raising

awareness (60.1%), with a health professional raising awareness in 16.4% of cases. Physical activity was practised in 32.5% of cases. Team sports and jogging were the most popular physical activities (71.4% and 36.4%).

Maintaining good health and enjoyment were the main motivations cited (64.9% and 40.3%). Non-exercisers cited laziness (86.1%) and dislike (13.9%). 91.6% of traders recognized the positive impact of physical activity on health. This benefit is said to be for the heart (70.9%), weight (66.9%), brain (31.4%) and lungs (28.7%). The diseases associated with not taking part in physical activity are cardiovascular disease (66.2%), obesity (54.2%) and diabetes mellitus (30%). Our study revealed a statistically significant association ( $p < 0.05$ ) between physical activity and age, gender, education and marital status.

**Table 2.** *About Physical Activity.*

	Categories	Total	Percentage (%)
Awareness-raising (n=474)	yes	238	50.2
	No	236	49.8
	Media	143	60.1
entity responsible for awareness-raising (n=238)	Entourage	80	33.6
	Health Practicioners	39	16.4
Taking part in physical activity (n=474)	yes	154	32.5
	no	320	67.5
Reasons of practicing exercise (n=154)	Good Health	100	64.9
	Pleasure	62	40.3
Reasons of not exercising (n=320)	laziness	276	86.1
	uninterested	44	13.9
	Team sports	110	71.4
Physical exercise done (n=154)	Jogging	56	36.4
	Walking	20	13
Positif Impact (n=474)	Yes	434	91.6
	No	40	8.4
	heart	336	70.9
Benefits (n=474)	weight	317	66.9
	Brain	149	31.4
	lung	136	28.7
Diseases linked to non-practice (n=474)	Heart diseases	314	66.2
	obesity	257	54.2
	Diabetes mellitus	142	30

**Table 3.** *Factors associated with physical activity.*

Independent variable	Practicing exercise physical		Khi <sup>2</sup>	p	OR	IC
	Yes	No				
Age						
[19-39]	109	134	13.8	0.000 (S)	2.22	1.45-3.4
[40-79]	45	123				
Gender						
Male	135	217	21.4	0.000 (S)	3.4	1.98-5.76
Female	19	103				
Educational Level						
High (superior)	30	21	18.07	0.000 (S)	3.44	1.9-6.2
Low (primary/secondary/none)	124	299				
Marital Status						
Single	72	118	4.42	0.04 (S)	1.5	1.01-2.21
Married	82	202				
Type of Trade						
Shop	136	262	3.2	0.075 (NS)		
Display	18	58				
Type of goods sold						
Domestic appliances	46	102	0.19	0.66 (NS)		
Non-Domestic appliances	108	218				
Transportation Means						
Yes	80	153	0.7	0.4 (NS)		
No	74	167				
Care taken to ensure the quality of food						
Yes	69	145	0.01	0.92 (NS)		
No	85	175				
Day of rest in the week						
Yes	39	103	2.33	0.13 (NS)		
No	115	217				
High Blood pressure						
Yes	5	13	0.19	0.66 (NS)		
No	149	307				
Diabetes mellitus						
Yes	1	4	0.36	0.55 (NS)		
No	153	316				
Asthma						
Yes	2	14	3.02	0.08		
No	152	306				
BMI						
Normal (18.5-24.9)	86	158				

Independent variable	Practicing exercise physical		Khi <sup>2</sup>	p	OR	IC
	Yes	No				
Abnormal (Thinness)	3	3	0.56	0.46		
Abnormal (overweight at least)	65	159	2.07	0.15		

## 4. Discussion

The average age of the respondents was 36. This was therefore a population of young adults. This young age is specific to the population in developing countries. According to the Ivorian National Health Development Plan 2016-2020 [22], approximately 66.67% of Ivorians are under the age of 25. Also, young age is the period par excellence when the individual is professionally active [23].

The predominance of men can be explained by the type of items most commonly found among the salespeople surveyed. Home appliances have naturally and historically attracted men more than women. So it's not surprising that appliance store managers are predominantly male. Since the management of household appliances can ideally only be carried out in specially equipped premises, the predominance of stores seems justified. Also, the standing of the area under study dictates a certain standard of commercial activity. The relative financial autonomy provided by an income-generating activity, notably commerce, could explain the high proportion of people living as couples (cohabiting and married) in our study. Their activity takes place outside the family framework. The impossibility of going home for lunch, at the risk of losing potential buyers, forces traders to buy food on the spot. This situation does not always allow them to control what is purchased, especially as most of them are in apparently good health. Inappropriate food represents a recognized risk of obesity [24].

Traders owned a personal transport vehicle (49.2%), so their usual means of locomotion was dominated by motorized vehicles (66.5%). This may be explained by the fact that mechanization is more widespread in urban areas than in rural ones, to the extent that motorized vehicles are the usual means of transport. Modern life is hardly conducive to physical exercise [25].

Nearly half of traders had been made aware of the need for physical activity and sport (49.8%). This is a social fact that is still relevant today [26]. Health professionals were not the main channel for raising awareness of the need for physical activity. A lack of hospital attendance by shopkeepers, explained by their apparent state of good health, and/or insufficient promotion of physical activity by health workers could explain this low awareness of the need for physical activity. To the credit of health professionals, we have to acknowledge the role played by the media in transmitting information, given their plethora and easy accessibility. The main difficulty is the reliability of information sources, which are not always easy to verify.

The proportion of non-practitioners was 67.5%. The results of surveys carried out in many countries demonstrate a general population trend towards lower levels of physical

activity. For example, the 2014 Eurobarometer shows in France a 5% drop in regular physical activity since 2009, and an 8% increase in people who never practice. The same trend can be seen in several Western European countries. These results are confirmed by national surveys [27].

The main reasons for taking part were health maintenance (64.9%) and pleasure (40.3%). In the study by Biziwana et al in Burundi, the main motivation for physical activity was to maintain health (84.33%), while pleasure was mentioned in 35.2% of cases [28].

The reasons given by traders for not exercising were laziness (86.1%) and professional occupation (82.5%). In their study, Mehadji in Algeria [29] cited lack of time (65.8%) as the main obstacle cited by non-practitioners. Lack of time and the demands of work were cited in 73.48% and 55.8% of cases respectively in the study by Biziwana et al [28].

Theories concerning human motivation have long been applied to the physical activity context, and recently, multi-theoretical approaches have given us interesting insights. In a recent review conducted by Rodrigues and colleagues [30] grounded in Self-Determination Theory (SDT) [30, 31] and the Hierarchical Model of Intrinsic and Extrinsic Motivation (HMIEM) [30, 32], exercisers' perceptions of interpersonal behaviors, Basic Psychological Needs (BPN), and self-determined motivation were studied. Results showed the importance of supportive behaviors as forecasters of self-determined motivation, promoting positive emotional, cognitive, and behavioral outcomes [30].

Almost all the population studied (91.6%) felt that practising a physical activity was beneficial to their health. These benefits were observed for the heart (73.0%) and weight (71.1%).

The diseases mentioned in connection with non-practice were: cardiovascular disease, obesity, diabetes mellitus and cancer (66.2%, 54.2%, 30.0%, 5.9% respectively). Physical inactivity represents one of the major risks of morbidity and mortality associated with the development of chronic diseases. Several studies underline the impact of physical inactivity: 6-10% of global mortality associated with non-communicable diseases is linked to physical inactivity, with an even higher percentage for certain pathologies [13, 27, 33]. Conversely, regular physical activity improves quality of life and reduces the effects of advancing age [27].

In our study, univariate analysis revealed a statistically significant relationship between Exercise and age, gender, level of school education and marital status ( $p < 0.05$ ). Younger subjects appeared to be more physically active than older ones. This seems to be explained by the natural physical capacities that regress with advancing age. Male subjects seemed to engage in more physical activity than females, as household chores in Africa have historically been

the exclusive preserve of women, making it difficult for them to find time for other leisure pursuits.

The results of our study are in line with those of Bizimama *et al.* and Guthold *et al.* [34]. In a survey carried out in 51 countries worldwide (Europe, Asia and Africa) in 2008, these authors showed that men participated more in physical activities than women [28].

People not living with a partner, who probably had more free time, seemed to participate more in physical activities than people living with a partner, as did people with a higher level of school education. Our results showed that the higher the level of education, the more people took part in sporting activities. These results corroborate those of Giles-corti and Donovan [35] who revealed that in the Australian population aged 18 to 59, the level of education and household income is positively correlated with the level of physical activity. According to these authors, compliance with public health recommendations for physical activity was 17% to 26% higher among those with university certificates or diplomas compared to those with less than a high school education.

## 5. Limitations

We did not seek information on the frequency, duration and quantity of physical exercise, as we were more focused on the idea of knowing whether the populations surveyed were aware of the importance of practicing physical activity. Also, the exhaustive nature of our study population does not allow us to generalize our results to all shopkeepers in the city of Bouaké. Not with standing these limitations, given the scarcity of literature on this topic in sub-Saharan Africa, this study has the merit of having been carried out.

## 6. Conclusion

The epidemiological breakthrough of non-communicable diseases with their deleterious consequences no longer needs to be demonstrated. The scientific community, especially in underdeveloped areas, must adopt a forward-looking attitude. This study revealed that shopkeepers are of a young age, mostly in apparent good health, and have rarely benefited from awareness-raising on the part of health professionals. This awareness concerns the need for Exercise. In most cases, they were not physically active at all, mainly because they were lazy. However, the health benefits of physical exercise were unanimously recognized.

## Conflict of Interests

The authors have not declared any conflict of interests.

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## References

- [1] WHO: Global Health Observatory Data. NCD mortality and morbidity. [[http://www.who.int/gho/ncd/mortality\\_morbidity/en/](http://www.who.int/gho/ncd/mortality_morbidity/en/)], accessed: [April 10, 2019].
- [2] Sécua F, Erismann S, Cerniciuc C, Chater A, Shabab L, Glen F, Curteanu A, Serbulenco A, Silitrari N, Demiscan D, Prytherch H. Evidence-based policy making for health promotion to reduce the burden of non-communicable diseases in Moldova. *BMC Proc.* 2020 Mar 6; 14 (Suppl 1): 1. doi: 10.1186/s12919-020-0183-8. PMID: 32165921; PMCID: PMC7059653.
- [3] Kassa MD, Grace JM. Noncommunicable Diseases Prevention Policies and Their Implementation in Africa: A Systematic Review. *Public Health Rev.* 2022 Feb 9; 42: 1604310. doi: 10.3389/phrs.2021.1604310. PMID: 35295954; PMCID: PMC8865333.
- [4] Allen LN, Nicholson BD, Yeung BYT, Goiana-da-silva F. Implementation of Non-communicable Disease Policies: A Geopolitical Analysis of 151 Countries. *Lancet Glob Health* (2018) 8 (1): e50–8. Available from. doi: 10.1016/S2214-109X (19) 30446-2.
- [5] Tuangratananon T, Wangmo S, Widanapathirana N, Pongutta S, Viriyathorn S, Patcharanarumol W, *et al.* Implementation of National Action Plans on Noncommunicable Diseases, Bhutan, Cambodia, Indonesia, Philippines, Sri Lanka, Thailand and Viet Nam. *Bull World Health Organ* (2018) 97 (2): 129–41. doi: 10.2471/BLT.18.220483.
- [6] Heller O, Somerville C, Suggs LS, Lachat S, Piper J, Aya Pastrana N, *et al.* The Process of Prioritization of Non-communicable Diseases in the Global Health Policy arena. *Health Policy Plan* (2019) 34 (5): 370–83. doi: 10.1093/heapol/czz043.
- [7] World Health Organization. *Noncommunicable Diseases Progress Monitor*, 46. Geneva: WHO (2017).
- [8] World Health Organization. *Egypt Multisectoral Action Plan for Noncommunicable Diseases Prevention and Control 2018 – 2022*. Geneva: WHO (2018).
- [9] White-Guay B, Smith L, Yadav P, Mattke S, Kruk M, Felicia Marie Knaul GN, *et al.* Addressing the Gaps in Global Policy and Research for Noncommunicable Diseases: Policy Briefs from the NCD Working Group. Geneva: Hopkins Univ. (2012). p. 1–28. October.
- [10] World Health Organization. *Time to Deliver: Third UN High-Level Meeting on Noncommunicable Diseases*. Geneva: WHO (2018).
- [11] Thornton J, Nagpal T, Reilly K, Stewart M, Petrella R. The 'miracle cure': how do primary care physicians prescribe physical activity with the aim of improving clinical outcomes of chronic disease? A scoping review. *BMJ Open Sport Exerc Med.* 2022 Aug 5; 8 (3): e001373. doi: 10.1136/bmjsem-2022-001373. PMID: 35999822; PMCID: PMC9362801.
- [12] World Health Organization. *Who global recommendations on physical activity for health*; 2010: 9. <https://www.who.int/publications/i/item/9789241599979> [Accessed 09 Jun 2022].

- [13] Lee I-M, Shiroma EJ, Lobelo F, et al. Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *Lancet* 2012; 380: 219–29.
- [14] Hallal PC, Andersen LB, Bull FC, et al. Global physical activity levels: surveillance progress, pitfalls, and prospects. *Lancet* 2012; 380: 247–57.
- [15] Kohl HW, Bull F, Merom D. Surveillance of Physical Activity for Public Health. In: *The third International Congress on physical activity and public health*. United States: Human Kinetics Publishers, 2010: S351–3. <https://research-repository.uwa.edu.au/en/publications/surveillance-of-physical-activity-for-public-health>
- [16] Warburton DER, Charlesworth S, Ivey A, et al. A systematic review of the evidence for Canada's physical activity guidelines for adults. *Int J Behav Nutr Phys Act* 2010; 7: 39.
- [17] Bricca A, Harris LK, Jäger M, et al. Benefits and harms of exercise therapy in people with multimorbidity: a systematic review and meta-analysis of randomised controlled trials. *Ageing Res Rev* 2020; 63: 101166.
- [18] Ozemek C, Laddu DR, Lavie CJ, et al. An update on the role of cardiorespiratory fitness, structured exercise and lifestyle physical activity in preventing cardiovascular disease and health risk. *Prog Cardiovasc Dis* 2018; 61: 484–490.
- [19] Godlee F. The miracle cure. *The BMJ* 2019; 366.
- [20] Institut National de la statistique de Côte d'Ivoire (INS) (2021). Résultats globaux du recensement général de la population et de l'habitat 25 p.
- [21] N'DA P. Recherche et méthodologie en sciences sociales et humaines: réussir sa thèse, son mémoire de master ou professionnel, et son article. Editions L'Harmattan. 2015.
- [22] Ministère de la santé et de l'Hygiène Publique de Côte d'Ivoire (MSHP) (2016). Plan National de Développement Sanitaire (PNDS) 2016- 2020; 1: 88.
- [23] Soumahoro SI, Kouassi DP, Sokodogo AM, Coulibaly M, Kouame AD, Tuo WA, et al. Knowledge and management of WEEE by independent repairers in the city of Bouake in a context of health and environmental risk, 2022 *J. Public Health Epidemiol* Vol. 14 (4), pp. 173-182, October-December 2022 DOI: 10.5897/JPHE2022.1416 Article Number: 6BAE8AF70114 ISSN 2141-2316.
- [24] Rachel M, Raphael L, Marie- Françoise L, Isabelle M. Activité physique et consommation de fruits et légumes: représentation sociale en fonction de l'âge. *Santé publique* 2010. 22 (4). 417-424 DOI: 10.3917/spub.104.0417.
- [25] RADEL A, «Chapitre 5. Le problème de la sédentarité et la promotion des pratiques corporelles dans deux campagnes d'éducation pour la santé (1980 et 2001)», dans: Jacques Defrance éd., *Le Sport au secours de la Santé. Politiques de santé publique et activité physique Une sociohistoire, 1885-2020*. Vulaines-sur-Seine, Éditions du Croquant, «Hors collection», 2021, p. 351-378. DOI: 10.3917/asava.defra.2021.01.0351. URL: <https://www.cairn.info/le-sport-au-secours-de-la-sante--9782365122993-page-351.htm>
- [26] Lesage C. Facteurs de résistance à la prescription d'activité physique et sportive sur ordonnance: enquête auprès des médecins généralistes d'Inde- et-Loire. Thèse Med: Univ François-Rabelais; 2016: n°X. 85p.
- [27] Ungureanu J, Toussaint JF, Breton É. Améliorer les politiques nationales de promotion de l'activité physique favorable à la santé. *Santé Publique* 2018, 30, 157-167. <https://doi.org/10.3917/spub.182.0157>
- [28] Bizimana JB, Lawani MM, AkpLogan B, Hounmenou MA, Barres FEM. Facteurs motivants et profil socioprofessionnels des pratiquants d'activités physiques d'entretien au Burundi: étude sur 332 sujets adultes. *Rev. CAMES SANTE* 2014. 2: 62-71, N° 2.
- [29] Mehadjji A. E., Prévalence de l'obésité et du surpoids chez les travailleurs Des résidences universitaires de Kharoub Mostaganem en 2017. Mémoire de Master en Sciences Infirmières, Univ Abdelhamid Ibn Badis de Mostaganem en Algérie, 2017. N°x: 78p.
- [30] Rodrigues F, Teixeira DS, Cid L, Monteiro D. Promoting Physical Exercise Participation: The Role of Interpersonal Behaviors for Practical Implications. *J Funct Morphol Kinesiol*. 2019 Jun 25; 4 (2): 40. doi: 10.3390/jfmk4020040. PMID: 33467355; PMCID: PMC7739331.
- [31] Ryan, R.; Deci, E. *Self-Determination Theory. Basic Psychological Needs in Motivation, Development, and Wellness*; Guildford Press: New York, NY, USA, 2017.
- [32] Vallerand, R. Toward a hierarchical model of intrinsic and extrinsic motivation. *Adv. Exp. Soc. Psychol*. 1997, 29, 271–360.
- [33] WHO. Global health risks: mortality and burden of disease attributable to selected major risks, 2009.
- [34] Guthold R, Ono T, Strong KL, Chatterji S, Morabia A. Worldwide variability in physical inactivity a 51-country survey. *Am J Prev Med*. 2008 Jun; 34 (6): 486-94. doi: 10.1016/j.amepre.2008.02.013. PMID: 18471584.
- [35] Giles-Corti B, Donovan RJ. The relative influence of individual, social and physical environment determinants of physical activity. *Soc Sci Med*. 2002 Jun; 54 (12): 1793-812. doi: 10.1016/S0277-9536 (01)00150-2. PMID: 12113436.