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*Full Length Research Paper*

## Pattern of renal impairment among hypertensive subjects in Umuahia, South East, Nigeria

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Hypertension is a cause and consequence of chronic kidney disease (CKD). The present study investigated the patterns of renal impairment among hypertensive subjects in Umuahia, South East, Nigeria. A cross-sectional study involving 262 subjects comprising equal number of hypertensive and non-hypertensive was used. Questionnaires were administered; medical, socio-demographic and anthropometric profiles were obtained. Blood samples were taken for creatinine determination and glomerular filtration rate (GFR) was estimated using the modification of diet in renal disease (MDRD) equation. The GFR in hypertensive group was  $87.4 \pm 30.2$  ml/min/1.73 m<sup>2</sup> compared to  $99.9 \pm 32.3$  ml/min/1.73 m<sup>2</sup> in the non-hypertensive. In the hypertensive group, 30.5, 29.0 and 0.8% had mild, moderate and severe renal impairment respectively whereas in the non-hypertensive group, the values were 28.2, 14.5 and 0.8% respectively. The prevalence of CKD in hypertensive subjects was 29.8% while that in the non-hypertensive was 15.3%. 55.6% of male hypertensive subjects had mild to moderate renal impairment compared to 23.5% in the non-hypertensive group; the difference between hypertensive and non-hypertensive in females was not statistically significant. More females had CKD than their male counterparts. Hypertension might have increased incidence of renal impairment and prevalence of CKD in Nigeria. This underscores the need for screening for CKD in the general population.

**Key words:** Essential hypertension, glomerular filtration rate, chronic kidney disease.

### INTRODUCTION

Hypertension is a leading risk factor for the development and increased prevalence of chronic kidney disease (CKD) (Tedla et al., 2011). The prevalence of both hypertension (20% to above 40%) and CKD (8-16%) has been on the increase globally (Vivekanand et al., 2013).

CKD is the presence of kidney damage or decreased kidney function, which is progressive (from three or more months to years) irrespective of clinical diagnosis (Levey et al., 2013). Hypertension is defined as systolic blood pressure (SBP)/diastolic blood pressure (DBP) of

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≥140/90 mmHg (JNC-7, 2003). Essential hypertension remains the most common cause of cardiovascular disease among black Africans, and it is a significant cause of adult morbidity and mortality (Akinkugbe, 2003). The excess mortality in blacks due to heart disease, renal failure, and stroke is directly related to the excess burden of hypertension (Laragh, 2001). The high prevalence of hypertension in Nigerian and Sub-Saharan Africa may be attributed to lifestyle changes such as urbanization and adoption of western lifestyle, sedentary lifestyle and consumption of fast foods in the cities (Agaba et al., 2009). Hypertension is both a cause and a consequence of chronic kidney disease, but the prevalence of chronic kidney disease throughout the diagnostic spectrum of blood pressure has not been established (Diedra et al., 2010). Current data indicate that cases of hypertension and CKD seen in the hospital are just a tip of the iceberg. The submerged portion of the iceberg represents the larger, hidden and undiagnosed mass of the disease. The poorest populations are at the highest risk. Screening of individuals at risk will ensure early detection of CKD and timely intervention to prevent progression to end-stage renal disease (ESRD). Screening and intervention can prevent chronic kidney disease, and where management strategies have been implemented the incidence of end-stage kidney disease has been reduced (Vivekanand et al., 2013). Dialysis and kidney transplant, which are renal replacement options for end stage renal disease (ESRD), are expensive and self-funded in Nigeria.

Understanding the burden of CKD in hypertensive individuals will help promote preventive strategies, initiate measures to reduce the prevalence of both CKD and hypertension and reduce the progression of CKD to ESRD whose cost of treatment is beyond the reach of most Nigerians. Estimation of GFR is one of the reliable means of investigation of renal function and provides information about the functional status of the kidneys. The present study investigated the patterns of renal impairment in hypertensive patients in a tertiary hospital in Umuahia, South East, Nigeria.

## METHODOLOGY

A cross-sectional study was adopted; 262 subjects comprising of equal number of hypertensive and non-hypertensive (131 each) were recruited for the study over a period of 5 months. Hypertensive subjects were recruited from the cardiology clinic of Federal Medical Centre (FMC) Umuahia, Abia State, Nigeria while non-hypertensive subjects were recruited both from those resident in and outside the town. The hospital is a tertiary Health Care Institution owned by the Federal Government of Nigeria. Umuahia is the capital of Abia State, located in South East, Nigeria. It has a population of about 359,230 people and the inhabitants are predominantly civil servants, traders and farmers.

### Inclusion criteria

1. Newly diagnosed hypertensive patients with no clinical evidence of CKD were recruited.

2. Hypertensive patients taking anti-hypertensive drugs were also recruited.
3. Age matched non-hypertensive subjects were recruited.

The subjects were adequately briefed about the study and signed informed consent forms.

### Exclusion criteria

Patients with risk factors for CKD such as diabetes mellitus, sickle cell anemia, congestive heart failure, family history of kidney disease, HIV, those on herbal medication and very sick patients were excluded from the study.

### Ethical clearance

Ethical clearance was obtained from the Health Research and Ethics Committee of FMC, Umuahia, Abia State (FMC/QEH/G.596/VOL.10/132).

### Data collection

Questionnaires were administered and medical history, socio-demographic and anthropometric parameters were obtained. Serum creatinine was measured and GFR estimated using MDRD equation.

### Measurements

Blood pressure (BP) was measured using a mercury sphygmomanometer (Acuson, England). Two consecutive readings were taken from each subject at 5 min interval and the average taken as mean BP. Hypertension was defined as systolic blood pressure (SBP) ≥140 mmHg and diastolic blood pressure (DBP) ≥90 mmHg (JNC-7, 2003). Weight (to the nearest 0.1 kg) and height (to the nearest 0.1cm) were measured using a seca stadiometer (Birmingham, UK) and body mass index (BMI) calculated using the formula:  $\text{Weight(kg)/height (m}^2\text{)}$  (Nwachukwu et al., 2010).

### Laboratory measurement

Venous blood (5 ml) was withdrawn from medial cubital vein into a vacutainer and allowed to stand undisturbed for 25 min. The clot formed was removed by centrifuging at 2000 rpm for 10 min. The resulting supernatant (serum) was transferred to a clean polypropylene tube using Pasteur pipette. Serum creatinine was determined using Jaffe's method (Pesce and Kaplan, 1987). Random blood sugar (RBS) was measured using acucheck glucometer.

### Glomerular filtration rate calculation

The modification of diet in renal disease (MDRD) equation was used to calculate GFR:

$$\text{GFR (ml/min/1.73 m}^2\text{)} = 175 \times (\text{S}_{\text{cr}})^{-1.154} \times (\text{Age})^{-0.203} \times (0.742 \text{ if female}) \times (1.212 \text{ if African}).$$

Using National Kidney Foundation guideline (2012), CKD was taken to be present at eGFR < 60ml/min/1.73 m<sup>2</sup> and absent at eGFR ≥ 60ml/min/1.73 m<sup>2</sup>. Renal function was staged as follows: Stage 1

**Table 1.** Sociodemographic characteristics of the subjects.

Characteristic	Non-Hypertensive n=131 (%)	Hypertensive n=131 (%)
<b>Sex</b>		
Male	63 (48.1)	68 (51.9)
Female	68 (51.9)	63 (48.1)
<b>Age (in years)</b>		
≤30	4 (3.1)	21 (16.0)
31-40	12 (9.2)	33 (25.2)
41-50	20 (15.3)	23 (17.6)
51-60	34 (26.0)	16 (12.2)
61-70	30 (22.9)	20 (15.3)
>70	31 (23.7)	18 (13.7)
Mean ± SD	58.1± 19.4	59.0 ±14.6)
<b>Educational status</b>		
Nil	31 (23.7)	24 (18.3)
Primary	33 (25.2)	23 (17.6)
Secondary	34 (26.0)	39 (29.8)
Tertiary	33 (25.2)	45 (34.4)
<b>Marital status</b>		
Married	89 (67.9)	71 (54.2)
Others	42 (32.1)	60 (45.8)

(normal) = GFR>90; Stage 2 (mild to moderate renal impairment) = GFR 60-89 and Stage 3-5 (CKD) = GFR< 60ml/ml/1.73m<sup>2</sup>.

### Statistical analysis

Results were presented as mean ± SD. Data was analyzed using statistical package for social sciences (SPSS) version 21.0. Student's "t" test was used to assess the significance. One way analysis of variance (ANOVA) was used to compare the difference between groups. P value of <0.05 was considered statistically significant.

## RESULTS

### Socio-demographic characteristics of subjects

The mean age of non- hypertensive (control) and hypertensive (cases) was 58.1±19.4 years and 59.0±14.6 years respectively (Table 1). About half of the non-hypertensive (51.2%) had at least secondary education compared to 47.4% found in the hypertensive group. Majority of the subject were married (hypertensive: 67.9%, non-hypertensive: 54.2%) (Table 1). Among the hypertensive, males constituted 48.1% and females 51.9% while among the non-hypertensive males constituted 51.9% and females 48.1%. In the hypertensive group, 63.3% of the females had mild to moderate renal impairment compared to 55% found in the males (Table 5). In the non-hypertensive group, 63.5% of the females had mild to moderate renal impairment compared to

23.5% of their male counterpart (Table 5). Renal impairment in the male non-hypertensive group was significantly lower ( $p<0.01$ ) compared to that in male hypertensive whereas there was no significant difference between the female values in both hypertensive and non-hypertensive. Both cases of severe renal impairment seen were females.

### Mean blood pressure and BMI of the hypertensive and non-hypertensive

The mean SBP was 161.6±20 and 123.6±11.9 mmHg while DBP was 93.4±14.8 and 75.0±9.8 mmHg in hypertensive and non-hypertensive subjects respectively. Both BP values were significantly different ( $p<0.001$ ) when compared to each other (Table 2). BMI values in both groups were not significant when compared to each other (Table 2).

### GFR pattern among the hypertensive non-hypertensive subjects

The mean eGFR in hypertensive subjects was 87.4±40.2ml/min/1.73 m<sup>2</sup>, this was significantly lower ( $p<0.05$ ) than that of non-hypertensive (99.9±42.3) (Table 3). In the hypertensive group, 30.5, 29.0 and 0.8% had mild, moderate and severe renal impairment respectively whereas in the non-hypertensive group, the values were 28.2, 14.5 and 0.8% respectively (Table 4). In the



**Table 2.** Mean blood pressure (BP) and body mass index (BMI) in hypertensive and non-hypertensive groups

BP/BMI	Hypertensive Mean ± SD	Non-Hypertensive Mean ± SD	t-test	P-value
SBP (mmHg)	161.6±20.0	123.6±11.9	18.65	<0.001
DBP (mmHg)	93.4±14.8	75.0±9.8	11.86	<0.001
BMI (Kg/m <sup>2</sup> )	26.7±5.3	25.5±4.8	1.86	0.06

**Table 3.** Mean eGFR in hypertensive and non-hypertensive subjects

Formula	Hypertensive Mean± SD	Non-hypertensive Mean±SD	t-test	P-value
MDRD ml/min/1.73 m <sup>2</sup>	87.4±30.2	99.9±32.3	2.45	0.015

**Table 4.** Patterns of renal impairment among hypertensive and non-hypertensive subjects.

eGFR (MDRD)	Hypertensive N=131 (%)	Non-hypertensive N=131 (%)
Normal	52 (39.7)	74(56.5)
Mild	40 (30.5)	37 (28.2)
Moderate	38 (29.0)	19 (14.5)
Severe	1 (0.8)	1 (0.8)
Failure	0(0)	0(0)

**Table 5.** Classification of GFR by sex among hypertensive and non-hypertensive subjects.

eGFR	Hypertensive		Non-hypertensive	
	Male (n=63)	Female (n=68)	Male (n=68)	Female (n=63)
Normal (Stage 1)	28 (44.4%)	24 (35.3%)	52 (76.5%)	22 (34.9%)
Mild (Stage 2)	18 (28.6%)	22 (32.4%)	16 (23.5%)	21 (33.3%)
Moderate (Stage 3)	17 (27.0%)	21 (30.9%)	0 (0.0%)	19 (30.2)
Severe (Stage 4)	0 (0.0%)	1 (1.5%)	0 (0.0%)	1 (1.6%)

hypertensive subjects, 39.7% had normal eGFR compared to 56.5% found in non-hypertensive (Table 4). The prevalence of CKD was 29.8 and 15.3% among the hypertensive and non-hypertensive subjects respectively; there was a significant difference ( $p<0.001$ ) in the pattern of renal impairment between cases and control. Among the hypertensive subjects, 27% of the males had CKD compared to 30.9% of the females; there was no significant gender difference (Table 5). Among the non-hypertensive subjects, none of the males had CKD compared to 30.2% of the females; there was a significant gender difference ( $p<0.001$ ) in this group (Table 5).

## DISCUSSION

Hypertension has been identified as one of the major risk factors that contribute to the global increase in

prevalence of CKD (Tedla et al., 2011). Uncontrolled hypertension can accelerate the development of CKD and may lead to ESRD. In the present study, hypertension significantly reduced GFR and the prevalence of CKD differed significantly between hypertensive and non-hypertensive subjects. This may be due to two factors: Lack of awareness leading to poor uptake of health care services and poverty. Many of the hypertensive subjects were not even aware that they have the disease and most were not aware of effect of hypertension on the kidney. Some of the hypertensive who knew that they have the disease blamed their inability to obtain regular health care services on their inability to afford the drugs. The prevalence of CKD (29.8%) among the hypertensive group was higher than that (8-16%) obtained from a previous study (Vivekanand et al., 2013). This is a clear indication of lack of awareness on both hypertension and its effect on the kidney in our environment. This may also contribute to

the recent increase in mortality from ESRD in Nigeria since most of the patients cannot afford the huge cost of kidney transplant. However, the prevalence of CKD from the present study was similar to that (27.5%) obtained in USA among hypertensive individuals (Diedra et al., 2010). These workers also obtained a prevalence of 13.4 % among non-hypertensive subjects while 15.3% was obtained in the present study. The difference in prevalence values in the two studies suggests that apart from hypertension, other factors such as nutritional, environmental, etc may also contribute to the development of CKD. Our results confirmed earlier reports that CKD is found even among the non-hypertensive (Diedra et al., 2010), though its prevalence in the hypertensive was twice that of the non-hypertensive in both studies. The possible reasons for this similarity may be due to adoption of western lifestyle, urbanization, sedentary lifestyle and consumption of fast food in most Nigerian cities including the study area (Agaba et al., 2009) which have earlier been linked to CKD (Diedra et al., 2010). Most young Nigerians are moving out of their local communities to cities in search of jobs and 'better life'. In a previous study, Diedra et al. (2010) reported higher prevalence of CKD among female Americans; in the present study, we also observed a higher prevalence of CKD in females of both hypertensive and non-hypertensive groups.

Previous studies have reported different figures for the prevalence of CKD in different parts of Nigeria; in Osun State, South-West Nigeria, the overall prevalence of CKD in general population was 18.8% (Oluyombo et al., 2013). In Edo State, South-South, Nigeria, a prevalence of 24.3% was reported among adults (Okoye et al., 2011) while a prevalence of 23.7% was reported in Enugu, South-East, Nigeria (Ulasi et al., 2009). These values are lower than that obtained from the present study because they were conducted in general population whereas we conducted only among hypertensive subjects and the exclusion criteria in the earlier studies were not clearly defined. However, a higher prevalence of 45.5% was reported among hypertensive patients in another previous study in Borno State (Nwankwo et al., 2009); this study was carried out among rural dwellers whereas the present study was done in an urban area. Socio-economic factors such as limited education, poverty, use of herbal remedies (which is rampant in rural communities) and untreated diseases like urinary tract infection may be the possible reasons for the higher prevalence of CKD reported among the rural dwellers. A higher prevalence of CKD (46%) was also reported in a multi centre study carried out in Ghana (Osafor et al., 2011) compared to 30% obtained in the present study.

In the present study, GFR in males was higher than that in females which indicates better renal function among males. In the hypertensive group, 32.4% of the females had CKD while 27% of the males had it whereas in the non-hypertensive group, no male had CKD

compared to 31.8% of females who had it. Age could be a contributory factor responsible for this disparity; 46.6% of the female hypertensive subjects were 60 years and above compared to 29% of the males since GFR reduces with age (National Kidney Foundation, 2012). Limited education and low income which were more predominant among the females might also have contributed to the higher prevalence among females. This finding supports previous studies in the United States which linked age, female sex, limited education and low income with greater prevalence of CKD (Diedra et al., 2010). The prevalence of CKD in both male and female hypertensive subjects agrees with that from a previous study by Osuji et al. (2012) who found no statistical significant difference between males and females GFR values in patients with congestive heart failure. This suggests that hypertension is also a risk factor the development of CKD.

## CONCLUSION

Hypertension increased renal impairment and the prevalence of chronic kidney disease in Nigeria. Females were affected more than males. Socio-demographic factors such as sex, educational and income status may be contributory factors. The pattern of renal impairment observed underscores the need for screening for CKD among hypertensive and non-hypertensive individuals.

## RECOMMENDATION

There is the need to create public awareness by appropriate government agencies and organizations about hypertension and CKD in our environment and develop strategies that will reduce their prevalence. More studies on CKD in different risk populations are recommended.

## Conflict of interests

The authors hereby declare that no conflict of interest exists among them.

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*Full Length Research Paper*

# Professionalism: An attempt to measure definition and understanding

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Professionalism is under scrutiny in all service-providing professions. Healthcare is one of them. There are rules and regulations mentioned from professional bodies that place the foundations of the definition of professionalism which have to be followed. A prospective study was conducted in a District General Hospital, with the aim to establish if professionalism was clearly defined. A questionnaire with open questions was given to 242 individuals from different disciplines including healthcare workers, students and members of the public. Their answers were grouped and then categorised using the points that the General Medical Council (GMC) uses to characterise professionals. The participants were divided in different groups according to their discipline and their grade of seniority and the findings were then analysed. The majority of the answers support that Teamwork is one of the fundamental criteria that constitute professionalism. On the other hand, Health, meaning the wellbeing of the health worker, had the lower preference between the participants' answers. Senior clinicians' group scored high and in general the Clinical group performed better than the Non-Clinical one. Students were divided into two sub-groups (Group A and Group B), according to their discipline. Group A performed at a similar level to Junior Clinical group. Group B achieved lower scores in certain categories such as Audit and Evaluation of Practice. In conclusion, all groups demonstrated a good understanding of the definition and factors that influence professionalism. Findings supports that an educational programme with an emphasis on the significance of all criteria the GMC mentions, will give a better outcome in future studies and this will help the community that the healthcare workers serve. In addition, educational programmes for the wider community would improve the relationship between healthcare workers and the public. A future study to include larger numbers of public members will better define their understanding about professionalism.

**Key words:** Professionalism, healthcare, education.

## INTRODUCTION

Behaviour, skills and attitude towards customers or other colleagues, during professional practice is a concern of many educators and professional bodies, and has been studied extensively in the past. The named properties

constitute professionalism, which is constantly regulated in all professional associations. There are a limited numbers of occupations having direct objective to human needs, and they are those with the subject of Medicine,

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**Table 1.** Given and read information.

<b>Information for the project</b>
Thank you for taking the time to participate in this study
The purpose of the study is to establish the degree of your understanding on the definition of “Professionalism” and how this affects the health care practitioner
Do all health professionals (clinical and non-clinical disciplines), despite their training and their regulatory bodies, as well as members of the public; have the same or a similar opinion about the meaning of Professionalism?
Furthermore, the aim of the study is to establish if there is a need of further education for health professionals or the community which they are serving
Your complete honesty is valued. The whole data is and will remain anonymously collected and will remain confidential. It will only be used for the purpose of the study
By agreeing to this information you give your consent to receive a questionnaire and take part in the study
You understand that you can withdraw from the research at any time without giving a reason

Law, Ministry and Education (De Rosa, 2006). In Healthcare, professionalism is gaining an increasing attention (Swick 2000; De Rosa 2006; Talbott and Mallott 2006). Doctors’ regulatory body, in their guidance, is emphasising that all professionals need to be very attentive towards their behaviour to their patients and the members of patient’s families, as well as other health professionals and colleagues. Professionalism is one of the fundamental criteria of every doctor’s appraisal and revalidation (American Board of Internal Medicine (ABIM), 2001; Irvine, 2005; General Medical Council (GMC), 2009; Scottish Government, 2012; Health Care and Professions Council (HCPC), 2014).

Professionalism is not only based on behaviour, but also reflects the professional competence of a physician (Swing, 2007). Professional competence is more than a demonstration of isolated competences and skills, and has to be examined as a whole entity. A competent clinician is able to think, feel and act, like a proper physician (Gale and Marsden, 1982; Eraut, 2000). Professional competence includes communication, knowledge, technical skills and clinical reasoning. It is more than the factual knowledge and includes the ability of solving problems with clear cut solutions. It can be defined by the individual’s ability to manage problems, make decisions with limited information given and tolerate uncertainty. It includes the possession of knowledge, attitude, ethical behaviour, altruism, belief and application of the profession’s codes, integrity and honesty, respect to others and self, self-regulation and maintenance of competence (Schon, 1983; Swick, 2000). It is measured by reviewing the individuals’ cognition, technical skills, scientific, clinical and humanistic judgement as well as use of time, team work, teaching, respect, learning, handling conflicts and willingness to recognise and correct possible errors (Epstein and Hundert, 2002). Professionalism can be described as “*the practice of doing the right thing, not because of how one feels, but regardless of how one feels*” (De Rosa, 2006).

Professionalism in Medicine must be the natural base of a physician’s work. Society expects health

professionals to have and demonstrate a professional manner in their conduct with the people they serve and to each other. All health workers have to understand in depth the meaning of the word “professionalism”, and how the lack of it will lead to negative consequences in their career and professional life. Misbehaviour which clearly affects their responsibilities towards the public, their colleagues, but also towards the wide community, leaves Medicine tarnished (Swick, 2000; ABIM, 2001; GMC, 2009). As professionalism is part of the educational curriculum in undergraduate level, there is an anecdotal feeling that more senior professionals would not have the same understanding on the subject.

The purpose of this study is to find out how different groups of different backgrounds, training, experiences and regulatory bodies define professionalism, and to find out if further education and training would be necessary, so individuals should be aware of the profession’s and mainly the community’s needs.

## METHODOLOGY

This is a study that was carried out in a District General Hospital. The choice of the institution was random as it was the place of work for the individuals who participated. Different groups of health workers (doctors from different grades of seniority, nurses, administrators, managers, health care assistants, and others as well as students) were included. Members of the public were asked to participate too. Unfortunately there was some resistance to the willingness of individuals from this category to participate when they were asked. Within the members of the public group, some individuals were patients. All individuals were randomly selected as they volunteered to participate when they were asked and took part in the study freely. As all members were volunteers randomly and conveniently selected there was no plan or possibility to have a randomised study with similarly selected matched groups. The opinions and answers of all individuals were included. Verbal consent was obtained from all participants after an information sheet was given, explaining the aims, objectives and the rationale, was given and read to them (Table 1). Ethical committee approval was obtained (University of South Wales).

The questionnaire was given to them with five questions (one with limited demographic details and four open questions), to be completed (Table 2). This was discussed and passed through a

**Table 2.** Questionnaire.

<b>Professionalism</b>			
<b><i>Please answer the following questions:</i></b>			
Are you a? (Please circle accordingly):			
Patient	Patient's Relative	Patient's Carer	
Administrator	Manager Senior	Manager	
Doctor	Junior	Senior	
Nurse	Auxiliary	Staff Nurse	Senior
Physiotherapist	Junior	Senior	
Student	Medical Nurse	Physiotherapist	Chiropractor
What is professionalism?			
What behaviours must healthcare professionals have?			
How can we improve professionalism in healthcare?			
If you wish to offer additional information, please do so below:			

small group of senior clinicians who gave their opinion and agreed on the questions and the criteria on which the "professionalism" will be quantified. As such, the criteria included in the GMC's publication were considered as relevant (2009). This group of clinicians did not participate in the study.

From the first question, the grade, position and properties of every participant was established. The participants were divided into clinical and non-clinical groups, as well as a separate group for healthcare (medical, nursing and chiropractic) students. The category of the clinical group was divided into two sub-groups (Senior and Junior Clinical Staff) according to their experience and their grade. The Student group was also divided into two sub-groups, Group A (medical students and student nurses) and Group B (chiropractic students). Members of the public were asked to take part, forming a very small group.

All replies were analysed by using the GMC's twelve criteria points that characterise professionalism, and were grouped accordingly (GMC 2009). These criteria were quantified according to the frequency of their presence per group and the total percentage was calculated. Further grouping was performed to assist with the quantification of the factors that can improve professionalism in healthcare. The frequency was calculated.

## RESULTS

All 242 participants answered the questions in the questionnaire. The different categories and subgroups were tabulated (Table 3). The opinions of all participants were grouped and analysed using the GMC criteria (GMC, 2009) as basis, for the definition of professionalism (Table 4). The clinical group was subdivided into senior and junior sub-groups (Table 5) for the reason to analyse the differences and understanding of professionalism in these separate sub-groups. There is an anecdotal feeling that seniors, due to their undergraduate and core training being carried out a long

time ago, are not familiar with the "scientific" definition of professionalism, in comparison to the juniors who have just finished their undergraduate training. The definition of professionalism is taught as part of their curriculum. By creating these two sub-groups, there is an opportunity to analyse their knowledge. The five participations from the public, although they were included in the initial analysis for the GMC criteria, were excluded at a later stage because of their small number. In some criteria it was obvious that they were not able to give any clear opinion. Following the numerous answers and feedback in every GMC criteria, it was found that participants from the clinical and student groups had a better overall understanding of professionalism than non-clinical staff. To achieve a better understanding of professionalism within the student group, two sub-groups were created. Group A consisted of the Medical and Nursing students whereas Group B consists of the chiropractic students. All findings are demonstrated in Tables 6. Detailed tables of the different groups are in the Appendix.

In all groups there are some criteria that scored lower than other. The most prominent is the limited understanding that the criterion of "Health" (a person has to keep and look after own health) is important to determine a professional individual. This criterion was recorded to be low in all groups. Senior clinicians though performed better than all other groups (92.3%), whereas the worse participants were the students (27.8%), only outperformed by junior clinical staff (42.8%).

On the contrary, everybody agreed that "Teamwork" is paramount to professional behaviour (ranging between 90 to 100% in all groups). It came as a surprise to see that "Teaching" scored high only in the Senior sub-group (100%), but all other groups did not think that it helps

**Table 3.** Participants categorised in groups.

Category	Subgroups	Number
Clinical group	Senior doctors	15
	Junior doctors	32
	Senior nurses	6
	Staff and auxiliary nurses	35
	Physiotherapy staff	3
	Senior physiotherapist	5
	Total	96
Non clinical staff	Health care assistant	25
	Managers and administrators	10
	Pharmacy technician	8
	Total	43
Students	Medical	8
	Nurses	10
	Chiropractic	80
	Total	98
All participants	Health workers	237
	Public	5
	Total	242

professionalism at the same degree (ranging between 34.8% at the non-clinical group to 64.3% at the junior staff, with the students averaging 40.8%). "Communication" was picked more by the non-clinicians (88.4%) than all others (averaging to 71.8%). Despite that the "Health" criterion gained a low amount of points, as it is one of the criteria rarely mentioned by them, on the other hand it was noticed that "Audit and Research" was picked up in the Junior staff group (97.1%), meaning that as soon as they were involved in clinical practice, they were stimulated and became aware of the importance that research has to their professional development. Student of Group A showed a higher rate in the categories of "Training" and "Audit" (55.6% in both) in comparison with Group B (chiropractic students) (40.8% and 30.6%), but both scored low in "Health" (Group A 27.8%, Group B 20.4%). The Non-clinical group scored lower than the Senior Clinical in the "Health" category but considered it as an important factor (58.1% in comparison with 92.3%), but if the junior staff is included they are almost in similar levels as the combined clinical score is 56.25%.

These finding also influenced the opinions of the participants in establishing the factors which can improve professionalism. The criteria categories of audit, feedback, appraisal and teaching, continuing professional development (cpd) and education both scored low (range 58.2% and 73.2%) while teamwork mentoring was the highest scorer (98.7%) for all participants (Table 7) and

the same pattern seen in Clinical (Table 8) and Student (Table 9) groups.

## DISCUSSION

A profession in general is more than a job. It is the activity and commitment of someone to serve others while simultaneously serving one's self. A professional has to be dedicated to the chosen profession. A doctor for example, takes the Hippocratic oath and binds to the commitment of using the obtained knowledge and skills for the service and treatment of all confronted illnesses. To do this, one has to demonstrate moral and ethical excellence. This person has to inspire trust, honesty and compassion to others and must have the courage to confront all difficulties that may arise.

To learn all this, the doctors must have cognition or pre-cognition of these properties, but must also train themselves during their professional journey as well as to follow another wiser person's steps and learn the ethics of the profession. The presence of a mentor will be necessary. Learning is paramount for continuous progress and improvement (De Rosa, 2006). In case that human weakness may surface, a doctor, and in extension a proper professional, has to ask for support and will need to visit the mentor for more advice. A mentor is useful as some of the information that is necessary for further development is hidden and it has to be identified,

**Table 4.** Grouped answers according to GMC criteria; All Participants (n 242).

GMC criteria	Senior staff (n=26)	Junior staff (n=70)	Non-clinical staff (n=43)	Students (n=98)	Public (n=5)	Total (n=242)	%
Relationship with patients	26	70	40	98	5	239	98.7
Providing good standard of practice	26	69	43	97	5	240	99.2
Maintaining good medical practice	26	65	38	90	4	223	92.1
Maintaining the standard of performance/Evaluate practice	26	58	20	60	0	164	67.8
Teaching/Training/Assessment	26	45	15	40	0	126	52.06
Confidentiality	26	66	43	97	5	237	97.9
Trust	23	45	28	28	4	128	52.9
Communication	22	60	38	53	0	173	71.5
Dealing with problems	25	60	39	80	0	204	82.3
Working with colleagues (Teamwork/Leadership/ Respect/Sharing information)	26	70	43	90	5	234	96.7
Audit /Research/Reporting/ Honesty/Ethics	25	68	15	30	0	138	57.0
Health	24	30	25	20	0	99	40.9

**Table 5.** Clinical group; Disciplines, experience grading; Subgroups.

Clinical group	Senior	Junior
Doctors	15	32
Nurses	5	35
Physiotherapist	6	3
Total	26	70

bringing it up on the surface and in real life (Hafferty and Franks, 1994).

Professionalism is under increased scrutiny across all professions, and mainly those in subjects that have a direct service towards other persons, like health, law, ministry or teaching. (De Rosa, 2006; HCPC, 2014). Professionalism, though, is not clearly and well defined. A lot of scholars and organisations place their criteria and regulations of what the word means and what characteristics a professional should have. Some of these criteria are common among the published

work, but other criteria are not well defined (ABIM, 2001; Swing, 2007; HCPC, 2014; GMC, 2009, 2015). The problem does not seem to be the definition that is coded by the different organisations, but the understanding of it that every single individual has, and how this individual will interpret the information or practice it. There are barriers that are threatening professionalism and these are lack of confidence, stress, fatigue, overwork, lack of experience, conflicts or tensions between professionals or arrogant superiors. Due to this, a healthcare worker has to be supported

with more training, obedience to policies, reflection and mentoring (Gale and Marsden, 1988; ABIM, 2001; Epstein and Hundert, 2002).

There is a consensus among scholars and organisations that training for the definition of professionalism has to start early in a health worker's life. A lot of educational institutions have curricula in which professionalism is taught. The definition codes are well explained; as they are well controlled and assessed within the educational programmes and courses, but it is stressed that it would be necessary to stimulate



**Table 6.** Comparison of all groups answers

<b>GMC criteria</b>	<b>Senior Staff (n=26)</b>	<b>%</b>	<b>Junior Staff (n=70)</b>	<b>%</b>	<b>Non-Clinical Staff (n=43)</b>	<b>%</b>	<b>Students Group A (Medical, Nurses) (n=18)</b>	<b>%</b>	<b>Students Group B (Chiropractic) (n=80)</b>	<b>%</b>
Relationship with patients	26	100.0	70	100.0	40	93.0	18	100.0	80	100.0
Providing good standard of practice	26	100.0	69	98.6	43	100.0	18	100.0	79	98.8
Maintaining good medical practice	26	100.0	65	92.8	38	88.4	17	94.4	73	91.3
% maintaining the standard of performance/Evaluate practice	26	100.0	58	82.8	20	46.5	15	83.4	45	56.3
Teaching/Training/Assessment	26	100.0	45	64.3	15	34.8	10	55.6	30	37.5
Confidentiality	26	100.0	66	94.3	43	100.0	18	100.0	79	98.8
Trust	23	88.5	45	64.3	28	65.1	6	33.4	22	27.5
Communication	22	84.6	60	85.7	38	88.4	15	83.4	38	47.5
Dealing with problems	25	96.1	60	85.7	39	90.7	16	88.9	64	80.0
Working with colleagues (Teamwork/Leadership/Respect/Sharing information)	26	100.0	70	100.0	43	100.0	18	100.0	72	90.0
Audit /Research/Reporting/Honesty/Ethics	25	96.1	68	97.1	15	34.8	10	55.6	20	25.0
Health	24	92.3	30	42.8	25	58.1	5	27.8	15	18.8

the personal cognitive knowledge, bringing the person to think and perform according to the rules. The educators have to be aware of their

students' different backgrounds and "adjust" their behaviour (Haffery and Franks 1994; Eraut, 2000). Professionalism is a combination of values,

behaviour and relationships (Engel et al., 2009). The professional competence is part of the professionalism (Eraut, 2000; Swick, 2000; Redfern

**Table 7.** Ways to improve professionalism (Grouped answers of all healthcare participants).

<b>Factors to improve professionalism (n 237)</b>	<b>Answers</b>	<b>%</b>
Team work/Mentoring	234	98.7
Training/CPD/Education	126	73.2
Communication/Role model	173	73.0
Maintaining Standards	164	69.2
Audit/Feedback/Appraisal	138	58.2

**Table 8.** Ways to improve professionalism (Grouped answers of clinical group).

<b>Factors to improve professionalism (n 96)</b>	<b>Answers</b>	<b>%</b>
Team work/Mentoring	96	100.0
Audit/Feedback/Appraisal	93	94.0
Maintaining Standards	84	87.5
Communication/Role model	82	85.4
Training/CPD/Education	71	74.0

**Table 9.** Ways to improve professionalism (Grouped answers of students).

<b>Factors to improve professionalism (n 98)</b>	<b>Answers</b>	<b>%</b>
Team work/Mentoring	90	91.8
Maintaining Standards	60	61.2
Communication/Role model	53	54.1
Training/CPD/Education	40	40.8
Audit/Feedback/Appraisal	30	30.6

et al., 2002; Scottish Government, 2012). As professionalism is considered an important part of a health worker's contract with society, every individual has to continue improving by constant training and exposing themselves to different experiences (Kirk, 2007). There are voices calling that the selection of health workers or health workers to be, have to start even on the admission process to the institution (Passi et al., 2010; Waheet et al., 2011; Scottish Government, 2012). Professionalism is necessary to be assessed by using a multitude of methods (Salvatori, 1996; Redfern et al., 2002).

The fear that all educational institutions have, is the unprofessional behaviour of students, which if present, may lead to negative behaviour at their future professional life. There was a warning of erosion of medical professionalism. People from different backgrounds may influence this. Students on the other hand are welcoming the diversity of different backgrounds of either their learners or educators, but they demand the need to follow ethical professional rules at all time. They have blamed the influence made upon them by the unprofessional behaviour of their educators, who were meant to be their mentors. Such behaviour can

have a devastating effect on them as it leads to confusion and bad habits (Swick et al., 1999; Roberts et al., 2004; Brainard and Brislen, 2007).

It has been suggested that students with unprofessional behaviour need to undergo mental health evaluation (Bennett et al., 2001). Students may demonstrate unprofessional behaviour if their teaching is insufficient and becomes impossible to them to fully understand the subject (Roberts et al., 2004; Reed et al., 2008). Due to the growing interest and emphasis on professionalism, there is the suggestion that psychiatrists need to be involved directly in the education of these matters, such as definition of professionalism (Talbot and Mallott, 2006). On the counts to tackle unprofessional behaviour, the implementation of measures such as, reflection, self-assessment and role model are thought to be more helpful in encouraging professional development, but it would be necessary to "ring-fence" the time allocated to the learners and release the pressure from the educators (Swick, 2000; Reed et al., 2008; Engel et al., 2009).

In the present study, the participating healthcare workers are of different grades and disciplines, trying to

throw light on the understanding that people have on professionalism. The GMC criteria of characteristics defining professionalism were used (GMC, 2009). From the findings it emerged that senior clinicians were highly aware of the criteria, despite that the subject was not present at the time of their undergraduate study. Junior staffs were aware in a quite comparable way.

Medical students and student nurses (Group A of the student group), performed in a similar way as the junior clinical staff, re-enforcing the finding of the professional body's review (GMC, 2015). It will not be possible to know how the senior clinicians would perform if the questions were placed to them immediately after their graduation, as this would directly compare the understanding they have with that of the junior staff. This way, someone could argue that it will be the ultimate test to validate if teaching of professionalism in the undergraduate level is helping or not. The similarities of the answers between the junior staff and Group A students compared with that of the senior group makes clear evident that the inclusion of the subject within the curriculum helps a lot and as soon as the juniors are connected in a professional level with the seniors they are improving their understanding.

The only striking difference is that the criterion of "Health", meaning the healthcare workers wellbeing, is not something that members of the junior staff group thought of as frequently as the senior staff which as a necessary criterion to indicate professionalism. The differences in the "Health" category scores between the combined student and junior clinical groups and the senior clinical group is thought to have resulted due to the age difference. Young people in general are known not to consider health decay as important. They perceive themselves as being strong and will live a lengthy healthy life. Seniors on the other hand have different views.

Small differences between student Group A and Group B in Audit or Evaluating Practice may result to the customary professional habit of chiropractors to practice as sole practitioners. This may have influenced their views. It is interesting to see that the members of public who participated, scored high in the majority of criteria. Interestingly, the majority of the participants in all groups agreed that working in harmony in a team and applying successful mentoring is a way that individuals can improve their professional life.

## LIMITATIONS

The study has some limitations:

1. The participation of non-clinical staff in comparison with clinicians is low in numbers.
2. The participation of public failed to reach acceptable numbers.
3. The criteria used were based on GMC regulations and

possibly other people apart from doctors were not fully aware of the different characteristics. This may have resulted in lower scoring marks in groups other than the clinicians.

4. In the Student group, Group A was considerably underpopulated in comparison with Group B.

5. The open questions led to "vague" answers which had to be interpreted accordingly and possibly in retrospect closed questions could give clearer results for a quantitative analysis.

6. The ambition to include a large and equal number of individuals of a variety of groups was not materialised due to the random and volunteer selection of the individuals.

## Conclusions

It was proven, within the limitations, that healthcare workers have a clear understanding of professionalism, according to the GMC definitions and within the barriers of their practices. Students performed well and the difference separating senior clinicians from their core training did not influence their comprehension of professionalism, which suggests this could be due to their increased experience. The inclusion of professionalism teaching within the undergraduate curriculum helps the understanding of the term, but only after contact on the juniors with the seniors the former improve their understanding in some of the criteria.

Further education may be useful to be conducted for the junior and student groups to emphasis the significance of the different factors influencing the professional development. Effort to educate sole practitioners may be useful to help them understand the different criteria other health practitioners use to define professionalism, and how this will be important to patients' benefit. Education of the wider community could be beneficial, and this way may be more willing to take part in a future study.

A further study has to be performed with grouping similar numbers of participants for all categories, and encourage more involvement of the general public.

## Conflict of Interests

Author has no financial, ethical or other relevant interests in the study

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**APPENDIX****Table A.** Comparison of clinical group's answers (n=96) (Senior (n=26) and Junior (n=70) Clinical Sub-groups).

<b>GMC criteria</b>	<b>Senior staff (n=26)</b>	<b>%</b>	<b>Junior staff (n=70)</b>	<b>%</b>	<b>Total (n=96)</b>	<b>%</b>
Relationship with patients	26	100.0	70	100.0	96	100.0
Providing good standard of practice	26	100.0	69	98.6	95	98.9
Maintaining good medical practice	26	100.0	65	92.8	91	94.8
% Maintaining the standard of performance/Evaluate practice	26	100.0	58	82.8	84	87.5
Teaching/Training/ Assessment	26	100.0	45	64.3	71	73.9
Confidentiality	26	100.0	66	94.3	92	95.8
Trust	23	88.5	45	64.3	68	70.8
Communication	22	84.6	60	85.7	82	85.4
Dealing with problems	25	96.1	60	85.7	85	88.5
Working with colleagues (Teamwork/Leadership/Respect/Sharing information)	26	100.0	70	100.0	96	100.0
Audit /Research/Reporting/Honesty/Ethics	25	96.1	68	97.1	93	96.8
Health	24	92.3	30	42.8	54	56.25

**Table B.** Answers of non-clinical group (n=43).

<b>GMC criteria</b>	<b>Non-clinical staff (n=43)</b>	<b>%</b>
Relationship with patients	40	93.0
Providing good standard of practice	43	100.0
Maintaining good medical practice	38	88.4
Maintaining the standard of performance/Evaluate practice	20	46.5
Teaching/Training/Assessment	15	34.8
Confidentiality	43	100.0
Trust	28	65.1
Communication	38	88.4
Dealing with problems	39	90.7
Working with colleagues (Teamwork/Leadership/Respect/Sharing information)	43	100.0
Audit /Research/Reporting/Honesty/Ethics	15	34.8
Health	25	58.1

**Table C.** Comparison of answers in student group (n=98) - Total and Sub-groups; Medical and Nurses (Group A (n=18)), Chiropractic (Group B (n=80)).

<b>GMC criteria</b>	<b>Students Group A (Medical, Nurses) (n=18)</b>	<b>%</b>	<b>Students Group B (Chiropractic) (n=80)</b>	<b>%</b>	<b>Total number of students (n=98)</b>	<b>%</b>
Relationship with patients	18	100.0	80	100.0	98	100.0
Providing good standard of practice	18	100.0	79	98.8	97	98.9
Maintaining good medical practice	17	94.4	73	91.3	90	91.8
Maintaining the standard of performance/Evaluate practice	15	83.4	45	56.3	60	61.2
Teaching/Training/Assessment	10	55.6	30	37.5	40	40.8
Confidentiality	18	100.0	79	98.8	97	98.9
Trust	6	33.4	22	27.5	28	28.6
Communication	15	83.4	38	47.5	53	54.1
Dealing with problems	16	88.9	64	80.0	80	81.6
Working with colleagues (Teamwork/Leadership/ Respect/Sharing information)	18	100.0	72	90.0	90	91.8
Audit /Research/Reporting/ Honesty/Ethics	10	55.6	20	25.0	30	30.6
Health	5	27.8	15	18.8	20	20.4

**Table D.** Comparison of answers between Group A (n=18) and Junior Clinical Staff (n=70).

<b>GMC criteria</b>	<b>Students Group A (Medical, Nurses) (n=18)</b>	<b>%</b>	<b>Junior staff (n=70)</b>	<b>%</b>
Relationship with patients	18	100.0	70	100.0
Providing good standard of practice	18	100.0	69	98.6
Maintaining good medical practice	17	94.4	65	92.8
% maintaining the standard of performance/Evaluate practice	15	83.4	58	82.8
Teaching/Training/Assessment	10	55.6	45	64.3
Confidentiality	18	100.0	66	94.3
Trust	6	33.4	45	64.3
Communication	15	83.4	60	85.7
Dealing with problems	16	88.9	60	85.7
Working with colleagues (Teamwork/Leadership/Respect/Sharing information)	18	100.0	70	100.0
Audit /Research/Reporting/Honesty/Ethics	10	55.6	68	97.1
Health	5	27.8	30	42.8



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