COVID-19 pandemic: an assessment of risk perception and the implementation of precautionary measures in a group of primary care workers in Nigeria

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Keywords
COVID-19 • General Practice Clinic • Precautionary measures • Primary care worker • Risk perception

Introduction
Like at various times in human history when different pandemics were experienced [1], the world is currently faced with the challenge of the COVID-19 pandemic, with healthcare workers at high risk of contracting infection. This study assessed the risk perception of COVID-19 and practice of precautionary measures against its spread by primary care workers.

Methods
This was a descriptive cross-sectional study of primary care workers in the General Practice Clinic (GPC) of University of Benin Teaching Hospital (UBTH), Nigeria, sub-Saharan Africa. A pretested self-administered semi-structured questionnaire was employed to obtain data on Socio-demographic characteristics, Risk perception of COVID-19, and Practice of precautionary measures from the respondents. Obtained data were analysed using IBM SPSS Statistics version 22.0 (Chicago, IL, USA). Chi-square test, Ordinal regression analysis and logistic regression analysis were performed. A p-value of less than 0.05 was considered statistically significant. Ethical clearance was obtained from the Health Research Ethics Committee.

Results
Most respondents (39.6%) had moderate risk perception of COVID-19. High risk perception was more frequent in females than males (27.8 vs 11.9%; Chi-square test; p-value = 0.001). Majority (76.0%) of the respondents had good practice of precautionary measures against COVID-19.

Conclusions
Most HCWs surveyed in this study had moderate-risk perception of COVID-19 and good practice of precautionary measures. It is recommended that formal training and retraining on Infection Prevention and Control (IPC) of infections, including COVID-19, should be regularly provided for all cadres of healthcare staff.
the risk of COVID-19 infection amongst 158, 445 Scottish healthcare workers aged 18-65 years and 229, 905 household members, Shah and colleagues found that during the first three months of the first wave of the COVID-19 pandemic in Scotland, patient-facing healthcare workers were three times more likely to be admitted with COVID-19 than non-patient facing healthcare workers and that the risk of COVID-19 infection was doubled among household members of patient/front-facing healthcare workers [22]. The above observations and realities are likely to engender some trepidation amongst healthcare workers about their risk of becoming infected in the workplace [23]. This may also affect their practice behaviours. It is therefore important to assess their risk perception and practice of precautionary measures against the spread of COVID-19. 

Aim: this study sought to assess the risk perception of COVID-19 and practice of precautionary measures against the spread of COVID-19 by healthcare workers working in the primary care clinic (General Practice Clinic) of a tertiary hospital in Nigeria. This study was conducted with the hope of having a better understanding of the healthcare workers’ risk perception and practice behaviours and making recommendations to improve hospital policy on infection prevention and control, safety measures and practice behaviours, as well as policies to protect the health workforce and control the rate of transmission to households and communities.

Methods

This was a descriptive cross-sectional study of healthcare workers in the General Practice Clinic (GPC) of a tertiary hospital in Nigeria, the University of Benin Teaching Hospital (UBTH). The study was conducted over a three-week period in the month of June, 2020, during the first wave of the COVID-19 pandemic. The General Practice Clinic is a primary care clinic and one of the hospital’s entry points through which patients make first contact with primary care physicians (such as Family physicians) and other health professionals for their healthcare needs. The healthcare workers surveyed in this study were Medical doctors, Nurses, Pharmacists, Medical Laboratory Scientists, and other allied health professionals and health workers. A pretested self-administered semi-structured questionnaire, which took about 5 minutes to complete, was employed to obtain data from the respondents. The questionnaire was divided into the following parts: Socio-demographic characteristics, Risk perception of COVID-19, and Practice of precautionary measures against the spread of COVID-19. The question: ‘How will you assess your risk of contracting COVID-19 in your workplace?’, was used to assess risk perception. The respondents were requested to reply ‘low’, ‘moderate’, ‘high’ or ‘not sure’, to the question. 17 yes or no questions were used to assess the respondents’ practice of precautionary measures, with each correct response scored “1” and each wrong response scored “0”. The scores ranged from 0 to 17, with the respondents’ practice of precautionary measures against the spread of COVID-19 classified as poor (≤ 9) or good (≥ 10).

All the obtained data were checked for completeness and were coded, grouped and analysed using IBM SPSS Statistics version 22.0 (Chicago, IL, USA). Descriptive statistics was used to obtain frequencies and percentages of the categorical variables (such as gender and marital status) of the respondents, while mean and standard deviation was used to present continuous variables. Chi-square test was used to determine association between categorical variables and risk perception and practice. Ordinal regression analyses and logistic regression analyses were performed to identify the factors predictive of risk perception and practice of precautionary measures against COVID-19 infection. A p-value of less than 0.05 was considered statistically significant. Ethical clearance was obtained from UBTH Health Research Ethics Committee. Informed written and voluntary consent was obtained before recruiting any participant. The purpose, procedure, and benefits of the study were explained to the participants. They were informed that the study had no attendant adverse effects or risks. To ensure confidentiality, the questionnaires were given coded means of identification, while the participants’ names were not used during the research.

Results

Sociodemographic characteristics of respondents

Out of a total of 115 healthcare workers in the General Practice Clinic of University of Benin Teaching Hospital (UBTH), 96 gave consent to participate in the study. Respondents aged 25 years and below were the least represented age group, 11 (11.5%). Most of the respondents had practiced in UBTH for 10 years and below (77.1%) and had tertiary education (Tab. I).

Risk awareness and attitude towards COVID-19

All the respondents were aware of COVID-19 and their risk of infection. Majority of the respondents (60.4%) agreed that necessary preventive and protective measures against COVID-19 had been put in place in their workplace. Less than half (43.8%) of the health workers felt safe and secure at their workplace, 38.5% said they did not feel safe and secure, while 17.7% were not sure if they were safe and secure at their workplace. Only 26.0% felt like stopping work for fear of contracting COVID-19, even though sixty-three (63.6%) of the healthcare workers (HCWs) agreed that they were afraid of contracting COVID-19, while 28.1% were not afraid, and 6.3% were not sure. Only about a third (32.3%) of the respondents reported that they had received training on infection prevention and control against COVID-19. Majority of the respondents (85.4%) believed that use of personal protective equipment (PPE) can reduce the
risk of contracting COVID-19, while 7.3% didn’t and 7.3% were not sure. While 69 (71.9%) respondents used PPE at work, 27 (28.1%) did not. Most of the healthcare workers (77.1%) in this study reported that there had been COVID-19 cases in their places of work, while 12.5% were not sure. A total of 17 (17.7%) had workplace and practice of precautionary measures against COVID-19 was 11.3 ± 2.4. Doctors (93.5%), pharmacists (90.0%) and medical laboratory scientists (90.0%) had significantly higher proportion of good practice of precautionary measures compared to other occupations (p = 0.040). A significant difference was also seen between length of practice in current workplace and practice of precautionary measures against COVID-19 (p = 0.007). Respondents who had practiced 10 years or less had the highest proportion of good practice of precautionary measures (45.5%). Analysis with binary logistic regression showed that occupation and length of practice were significant predictors of precautionary practice behaviour (p = 0.040 and 0.014 respectively) (Tab. IV).
Tab. II. Distribution of respondents’ risk perception of COVID-19 by sociodemographic characteristics.

| Sociodemographic characteristics | Risk perception categories | Test statistic | p-value |
|---------------------------------|---------------------------|---------------|---------|
|                                 | Low (n = 28 (29.2%))      | Moderate (n = 38 (39.6%)) | High (n = 20 (20.8%)) | Not sure (n = 10 (10.4%)) | Fisher's exact | P-value |
| Age (years)                     |                           |               |         |                     |                |         |
| ≤ 25                            | 4 (36.4)                  | 4 (36.4)      | 2 (18.2) | 1 (9.1)             |                |         |
| 26-35                           | 6 (24.0)                  | 8 (32.0)      | 9 (36.0) | 2 (8.0)             |                |         |
| 36-45                           | 13 (36.1)                 | 16 (44.0)     | 4 (11.1) | 3 (8.3)             |                |         |
| > 45                            | 5 (20.8)                  | 10 (41.7)     | 5 (20.8) | 4 (16.7)            |                |         |
| Gender                          |                           |               |         |                     | Fisher's exact | P-value |
| Female                          | 11 (20.4)                 | 18 (35.3)     | 15 (27.8)| 10 (18.5)           | 786            | 0.548   |
| Male                            | 17 (40.5)                 | 20 (47.6)     | 5 (11.9)| 0 (0.0)             |                |         |
| Marital status                  |                           |               |         |                     | Fisher's exact | P-value |
| Married                         | 17 (25.4)                 | 18 (41.8)     | 14 (20.9)| 8 (11.9)            | 5.479          | 0.581   |
| Single                          | 10 (35.7)                 | 10 (35.7)     | 6 (21.4)| 2 (7.1)             |                |         |
| Widowed                         | 1 (100.0)                 | 0 (0.0)       | 0 (0.0)| 0 (0.0)             |                |         |
| Occupation                      |                           |               |         |                     | Fisher's exact | P-value |
| Medical doctor                  | 10 (32.3)                 | 15 (48.4)     | 4 (12.9)| 2 (6.5)             |                |         |
| Administrative staff            | 4 (26.7)                  | 6 (40.0)      | 3 (20.0)| 2 (13.3)            |                |         |
| Nurse                           | 2 (15.4)                  | 4 (30.8)      | 5 (38.5)| 2 (15.4)            |                |         |
| Pharmacist                      | 0 (0.0)                   | 4 (40.0)      | 5 (50.0)| 1 (10.0)            |                |         |
| Medical Laboratory scientist    | 3 (30.0)                  | 4 (40.0)      | 2 (20.0)| 1 (11.1)            |                |         |
| Technician                      | 3 (33.3)                  | 4 (44.4)      | 1 (11.1)| 1 (11.1)            |                |         |
| Others                          | 6 (75.0)                  | 1 (12.5)      | 0 (0.0)| 1 (12.5)            |                |         |
| Level of education              |                           |               |         |                     | Fisher's exact | P-value |
| Tertiary                        | 23 (27.7)                 | 35 (42.2)     | 17 (20.5)| 8 (9.6)             |                |         |
| Secondary                       | 4 (35.3)                  | 3 (25.0)      | 3 (25.0)| 2 (16.7)            |                |         |
| Primary                         | 1 (100.0)                 | 0 (0.0)       | 0 (0.0)| 0 (0.0)             |                |         |
| Length of practice (years)      |                           |               |         |                     | Fisher's exact | P-value |
| ≤ 10                            | 22 (29.7)                 | 32 (42.3)     | 15 (20.3)| 5 (6.8)             |                |         |
| > 10                            | 6 (27.3)                  | 6 (27.3)      | 5 (22.7)| 5 (22.7)            |                |         |

Others: CHEW, health attendants, dieticians and drivers; * Statistically significant.

Tab. III. Regression analysis for factors associated with risk perception of COVID-19.

| Risk perception | OR (95% CI) | P-value |
|-----------------|-------------|---------|
| Age (years)     |             |         |
| ≤ 25            | -0.735 (-2.653 - 1.183) | 0.453   |
| 26-35           | 0.611 (-0.767 - 1.989)  | 0.385   |
| 36-45           | -0.292 (-1.462 - 0.878) | 0.625   |
| > 45            | Ref         |         |
| Gender          | -0.143 (-1.006 - 0.720) | 0.745   |
| Male            | Ref         |         |
| Female          |             |         |
| Occupation      |             |         |
| Medical doctor  | 3.380 (0.401 - 4.369) | 0.018*  |
| Nurse           | 3.221 (1.447 - 6.156) | 0.002*  |
| Pharmacist      | 5.566 (1.776 - 6.450) | 0.001*  |
| Medical Laboratory scientist | 2.462 (0.287 - 4.564) | 0.026*  |
| Technician      | 2.928 (0.246 - 4.399) | 0.028*  |
| Administrative staff | 3.530 (0.216 - 4.061) | 0.029*  |
| Others          | Ref         |         |
| Level of education |             |         |
| Primary         | 2.942 (-1.440 - 7.323) | 0.188   |
| Secondary       | 0.979 (-0.467 - 2.426) | 0.185   |
| Tertiary        | Ref         |         |
| Length of practice (years) |             |         |
| ≤ 10            | -0.91 (-0.312 - 2.776) | 0.118   |
| > 10            | Ref         |         |
| Training on infection prevention and control |             |         |
| Yes             | -2.162 (-3.205 - -1.120) | 0.000*  |
| No              | Ref         |         |
| Constant        | 56.755 (0.485) | 0.000*  |
| Adjusted R²     | 0.485 (48.3%) |         |
| P-value         | 7.154       |         |
| Standard error of estimate |             |         |

Others: CHEW, health attendants, dieticians and drivers; OR: Odds ratio; CI: Confidence interval; * Statistically significant.
Further analysis as shown in Table V showed that risk perception of COVID-19, training on infection prevention and control against COVID-19, and having a chronic medical condition were not significant predictors of practice of precautionary measures.

Discussion

This study was conducted during the first wave of the COVID-19 pandemic and was aimed at assessing the risk perception and practice of precautionary measures against COVID-19 by health care workers (HCWs) in the primary care clinic (General Practice Clinic) of a tertiary hospital in Nigeria, the University of Benin Teaching Hospital (UBTH). Concerning the respondents’ risk perception of COVID-19, this study found that only about 20% of the respondents stated they had high risk, while majority stated they had moderate risk. This differs from findings among the general Ghanaian population where majority of the participants had a high-risk perception towards COVID-19 [24]. However, a study in Portugal comparing the risk perception of COVID-19 among HCWs and the general population found more HCWs (54.9%) believed they were at higher risk compared to the general population (24.0%) and it was opined that this was due to their close contact with suspected or confirmed cases of COVID-19 [25]. In the present study, only a minority had
contact with suspected or confirmed cases of COVID-19 and only twenty six percent (26%) felt like stopping work due to fear of being infected. This may explain why most of the respondents had moderate risk perception of COVID-19. Significantly more females in this study had high risk perception of COVID-19 compared to males. This is particularly interesting in the light of study findings that indicate that males have higher risk of severity and mortality from COVID-19 compared to females [26]. Younger age groups have been associated with lower risk perceptions compared to older age groups [26, 27]. This is expected as the risk of infection, severity and mortality from COVID-19 increases with age [26, 28]. This study however found that those with the least proportion of low-risk perception of COVID-19 were respondents over 45 years of age, even though a good number of them were not sure of their self-perceived risk. A study on staff risk stratification in UBTH found that core clinical staff such as doctors and nurses made up over 75% of workers in the high-risk category [29]. In the present study however, pharmacists had the highest odds of having high risk perception (OR: 5.4; 95% CI = 1.776-6.450). Risk perception of infectious diseases has been found to correlate positively with practice of preventive health measures, especially during outbreaks [30]. This was seen in the present study as higher risk perception of the HCWs improved precautionary measure score by an odd of 1.8 (95% CI: 0.79-2.60). This was however not statistically significant (p = 0.108). This study showed that majority of the HCWs had good practice of precautionary measures against COVID-19 (76.0%), similar to findings on Coronavirus in Uganda [31], and in Saudi Arabia [32], as well as findings in Guinea on Ebola virus [33]. The practice of preventive measures against COVID-19 differed significantly across respondents’ occupation and length of practice in their current work place (p = 0.040 and 0.014 respectively). Worthy of note is that a higher percentage of respondents who worked fewer years had good practice compared to those who worked greater than 10years. This may be because more of the studied HCWs who have worked longer had poor COVID-19 knowledge. A study in Italy associated positive attitude to and practice of disinfection procedures with lower number of years of service among Nurses [34]. Over 25% of HCWs in the present study reported that they did not use personal protective equipment (PPE) at work. This is alarming as PPEs have been found to curb the spread of the disease [35]. However, this finding may be due to lack of sufficient PPEs for use by the healthcare workers, as well as the fact that only about 32.3% of the studied HCWs reported that they had training on infection prevention and control. The vast majority of respondents followed the WHO recommendation on use of facemask, hand washing, and use of alcohol-based hand sanitizer. However, fewer respondents covered their mouths when they coughed or sneezed and practiced social distancing. The practice of social distancing amongst HCWs in a health care setting may be challenging, as they are constantly in close contact with patients and other health workers in their line of duty.

Limitations
This study had some limitations, the first being that the study design used was cross-sectional and therefore causality cannot be deduced as the data were collected at one point in time. Secondly, only HCWs in the General Practice Clinic of University of Benin Teaching Hospital were surveyed, and therefore the results of this study may not be generalizable. However, the perspectives and data obtained from this study can be leveraged upon to conduct further studies and empanel policies and programmes to protect healthcare workers and guarantee workplace safety.

Recommendations
It is recommended that there should be regular and sustained supplies of personal protective equipment (PPEs) in every health facility, with healthcare staff regularly provided with the PPEs, to limit the spread of COVID-19. Furthermore, appropriate workplace safety policies and COVID-19 IPC protocols/guidelines should be put in place in every health facility, with medical doctors and other healthcare staff adequately compensated with encouraging welfare, remuneration, and insurance packages to motivate them to continuously discharge their clinical duties during the COVID-19 pandemic. It is advocated that more studies, preferably multi-centre studies, be conducted to address some of the study limitations.

Conclusions
Most of the healthcare workers (HCWs) surveyed in this study had moderate-risk perception of COVID-19 and good practice of precautionary measures. It is recommended that formal training and retraining on Infection Prevention and Control (IPC) of infections, including COVID-19, should be regularly provided for all cadres of healthcare staff to increase their knowledge and practice of precautionary measures, as well as reduce their risk of infection.

Acknowledgements
Funding sources: this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest statement
The authors declare no conflict of interest.

Authors’ contributions
OE did the conception, design, literature search, manuscript drafting, review, editing, and preparation for intellectual content.
MA did the definition of intellectual content, literature search, and data collection.
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Received on May 8, 2021. Accepted on November 8, 2021.

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How to cite this article: Enabulele O, Mobolaji A. COVID-19 pandemic: an assessment of risk perception and the implementation of precautionary measures in a group of primary care workers in Nigeria. J Prev Med Hyg 2021;62:E822-E829. https://doi.org/10.15167/2421-4248/jpmh2021.62.4.2145

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