Attitudes and beliefs of Spanish healthcare professionals during the COVID-19 pandemic

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Abstract
During the COVID-19 pandemic, healthcare professionals are taking the risk of becoming infected or infecting their families. Spain is the country with the highest number of infected healthcare professionals worldwide. Our aim was to study the attitudes and beliefs of these professionals during the current pandemic. Descriptive study conducted by using an online questionnaire—based on an earlier one—which was sent to healthcare professionals at the national level, during the week March 20-27, 2020. Healthcare professionals returned 971 completed questionnaires. A total of 803 (82.7%) participants thought that they did not have suitable PPEs (Personal Protective Equipment) to protect them from infection with COVID-19. In addition, even 229 (23.58%) agreed to go on working even if they were not. In spite of this, 606 (62.4%) of them were ready to work, even with a higher-than-usual risk of becoming infected at work and getting ill. Remarkably high professional commitment has been observed among Spanish healthcare workers in the current pandemic. They were ready to work even when many of them considered that they did not have suitable PPEs, and were thus taking a higher than usual infection risk. However, they put the health of their relatives before their duties at work.

Keywords
Pandemics, COVID-19, coronavirus infections, health personnel, attitude. (Source: MeSH NLM)
Introduction

While millions people worldwide stay at home in order to prevent or minimize the spreading of the COVID-19 coronavirus, healthcare professionals do exactly the opposite and keep going to their workplaces to fight the invisible enemy.¹ These professionals, besides supporting a heavy workload, usually have to extend their working hours. Some of them even refuse leaving the workplace to avoid carrying the virus to their homes and loved ones.²

In addition to taking a high risk of becoming infected and endangering their personal safety and integrity, these workers often experience episodes of anxiety, and concern for fear of being potential transmitters of the disease to their families.³ Professionals who have older adults or young children at home, face extra problems derived from the closing of schools, distancing, and social isolation policies, and unavailability or shortage of food or essential services.³

As the pandemic progressed in a rapid and uncontrolled way, access to PPE (Personal Protective Equipment) became an unmet need due to shortage of such equipment. Currently, a number of healthcare professionals continue to treat or care for infected patients while they expect to receive suitable PPEs.⁴ According to the recommendations of different public health entities such as the European Centre for Disease Prevention and Control⁵ or its South Korean equivalent (KCDC),⁶ health professionals managing COVID-19 positive or suspected patients should wear the following PPE: FFP2/FFP3 mask, gloves, protective glasses, and protective gown.⁵,⁶

Health services in many countries are currently overloaded and working beyond their capacity and they are expected to do so in the next few months due to the crisis caused by the new coronavirus.⁷ However, differently from artificial ventilators and other medical equipment, healthcare professionals cannot be manufactured urgently or keep working at 100% of their capacity during long time periods, since stress and exhaustion may deteriorate their immune system thus making them more susceptible to COVID-19 infection.¹ It is therefore crucial that governments consider these professionals as essential elements of the health system, which need proper training and equipments that guarantee their safety.⁸

Adequate supply of PPEs is only the first step of a long distance race. To defeat the pandemic, other measures have to be considered such as cancellation of non-priority surgery procedures or non-essential events, so as to optimize the use of available healthcare resources. Additionally, professionals should be granted suitable resting time and psychological support.³

According to data provided by the National Health Commission of the People’s Republic of China, more than 3000 Chinese health professionals had been infected by this new pandemic disease by the beginning of March 2020 while more than 10 had died by the end of February.⁹ By the end of March, Italy was the European country with the highest number of infected people, namely more than 86,000 confirmed cases.¹⁰ An important percentage of them (the 9%) corresponded to healthcare professionals and some of them have died from this disease.¹¹ In this context, reports on the state of Italian
healthcare personnel described physical and mental exhaustion because, due to resources shortage, they had to make hard decisions similar to those of war medicine. Thus, they often had to decide what patients will be treated on the basis of their survival possibilities. In addition, there is the pain caused by losing patients, the fact that they see their coworkers become ill and the awareness of the high infection risk from continued exposition to COVID-19 positive patients. In Spain, by the same time, the Coordination Center for Health Emergencies of the Ministry of Health reported that more than 9400 healthcare professionals from the Spanish National Health Service were had positive for COVID-19 and that they accounted for almost 15% of all cases reported throughout the country (72,248).

From earlier studies, it was estimated that in a pandemic scenario like the current one, up to 50% healthcare professionals would fail to comply with their duties at work in order to protect themselves or their families. For example, when Taiwan was affected by an outbreak of severe acute respiratory syndrome (SARS) in 2003, 50% of workers perceived work overload and impact on their personal and familial relationships. It could happen that there were a parallel between these situations and the current one.

On this basis, we aimed to analyze the attitudes and beliefs of Spanish healthcare personnel during the present COVID-19 pandemic.

Methods

Descriptive transversal study conducted through an online questionnaire at the national level. The questionnaire was based on an earlier one, published and validated by the United Kingdom National Health Service (NHS) in 2009. It was initially designed to assess the attitudes and beliefs of healthcare personnel during a hypothetic pandemic influenza. In 2017, our research team used the questionnaire, after back-translation and adaptation, to carry out a similar study in our context.

That tool was adapted to the current pandemic and used in the present research. Since this was self-administered questionnaire, the first part included a brief explanation of the study, a statement that responses were anonymous and a thank-you-for-participation note. It was distributed to Spanish healthcare professionals through electronic means.

Since the questionnaire was distributed electronically, the anonymity of the participants at a national level was guaranteed. Health professionals who gave their consent to participate in the study were included. The period of study was 1 week, 20–27 March 2020 namely in the midst of the pandemic.

The questionnaire consisted of four blocks of questions: a first block with questions on healthcare professionals’ beliefs regarding the pandemic, a second block about their attitudes toward work during the pandemic, a third block with personal questions and a final block including work-related aspects of the participant.
Our sample size was determined by the approximately 850,000 health professionals in Spain. For a confidence level of 95% and an error range of 4%, it was necessary to collect 600 participants.

Data were analyzed with the support of the Unidad de Apoyo a la Investigación del Complejo Hospitalario Universitario Insular Materno Infantil (CHUIMI) (Research Support Unit of the Mother and Child Insular University Hospital) of Gran Canaria, using the statistical software R Core Team 2020, version 3.6.3. Frequency and percentage of qualitative variables were calculated. The Pearson’s Chi-squared test was used to evaluate association between qualitative variables and the lineal-tendency test to assess the relationship between an ordinal variable and a qualitative one. P values lower than 0.05 were considered significant.

**Ethic statement**

This study has the approval of the Research Ethics Committee/Research Committee Research Ethics with Medicines of the Hospital Universitario de Gran Canaria Dr. Negrín (CEIm HUGCDN: 2020-189-1 COVID-19).

**Results**

**Profile of the personnel in the sample**

The sample consisted of 973 people, though two of them refused to participate in the study (n = 971). All included participants filled out the questionnaire completely. From participants, 735 (75.7%) were women, 517 (53.24%) were between 31 and 50 years of age, 419 (43.15%) were living with a partner and children, 505 (52.01%) were nurses thus being the most represented professionals in the sample, 804 (82.8%) were working in the public healthcare service and 416 (42.84%) were working in hospitals (Annex, Table 1).

**Healthcare professionals’ beliefs**

Most healthcare professionals, 706 (72.71%), believed that a vaccine against this pandemic disease will be developed. Regarding availability of such a potential vaccine, those working in the public health service considered it more probable to have access to it (66.4%) (p = 0.003).

There was the generalized perception among healthcare professionals, 803 (82.7%), that they were not being provided with PPEs suitable to protect them from becoming infected by COVID-19. Workers from social-healthcare centers most frequently reported lacking adequate protection equipment (92.2%) (p = 0.003). (Annex, Table 2).

**Healthcare professionals’ attitudes (I)**

An amount of 606 (62.4%) healthcare professionals were ready to work in spite of a higher-than-usual risk of becoming infected at work and getting ill. Conversely,
when they considered the high risk of infecting their families, up to 46.55% of them stated that they would probably not go on working. This response was especially frequent among professionals living with their parents (57.9%) (\( p = 0.028 \)), working in the private healthcare industry (56.4%) (\( p = 0.023 \)) and younger than 30 years (52.8%) (\( p = 0.006 \)).

Up to 42.02% professionals were ready to work in tasks for which they had not been trained, physiotherapists being ready to undertake such tasks with the highest probability (52.3%) (\( p = 0.019 \)).

Regarding protection equipment, 906 (93.31%) of them responded that they would work if they were provided with suitable PPEs, although 23.58% agreed to go on working even if they were not; 815 (83.93%) were ready to work more hours if they were asked to, physicians being the most predisposed ones to take overtime (90.7%) (\( p = 0.02 \)); 697 (71.78%) were ready to work in a different center if they were asked to, with professionals in the private healthcare industry (81.3%) (\( p = 0.017 \)) and younger than 30 (83.0%) (\( p < 0.001 \)) being the most predisposed ones (Annex, Table 3).

**Healthcare professionals’ attitudes (II)**

In general most healthcare professionals, 679 (69.93%), agreed on the idea that it is their duty to go on working during the pandemic despite the higher health risk, with professionals working in hospitals (73.6%) (\( p < 0.001 \)), male professionals (78.0%) (\( p = 0.003 \)), those working in the public health service (71.9%) (\( p = 0.003 \)), living with partner and children (76.8%) (\( p < 0.001 \)), and older than 51 years (81.5%) (\( p < 0.001 \)) being the ones who most supported this idea. Most participants, 822 (84.65%), considered that healthcare personnel should be first to receive diagnosis and treatment during the pandemic. A total of 662 (68.18%) participants disagreed with the idea that healthcare professionals should be allowed to refuse working with or close to COVID-19 infected patients, with professionals working in the public healthcare service (71.1%) (\( p < 0.001 \)), living with partner and children (73.5%) (\( p = 0.007 \)), and aged 31 to 50 years (73.1%) (\( p < 0.001 \)) expressing disagreement in the highest proportions.

However, 54.38% of them disagreed with the idea that professionals refusing to work during this health crisis should be penalized, with those working in social-healthcare centers (63.3%) (\( p = 0.017 \)), physicians (61.7%) (\( p = 0.04 \)), private healthcare professionals (64.7%) (\( p = 0.003 \)), those living with parents (66.8%) (\( p < 0.001 \)) and younger than 30 years (68.7%) (\( p < 0.001 \)) showing the highest proportions of disagreement.

Up to 669 (68.9%) healthcare professionals put their duties toward their families before their responsibility at work, with nurses (73.5%) (\( p = 0.001 \)), professionals cohabitating with their parents (79.9%) (\( p = 0.002 \)) and younger than 30 years (81.5%) (\( p < 0.001 \)) expressing disagreement in the highest proportions.

Finally, 901 (92.79%) healthcare professionals stated that they might refuse working with COVID-19 patients if they were not provided with suitable PPEs (Annex, Table 4).
Discussion

Epidemiological situation

In the first place, it’s important to put into context how the epidemiological situation was in Spain and, specifically in the region of the Canary Islands, when this study was being performed. Only 5 days after the study period ended, on April 1, 2020, the Ministry of Health reported that a total of 102,136 positive cases had been registered in Spain, being the 15% of them between healthcare personnel (15,100).18,19

On the other hand, regarding to the Canary Islands region, the Servicio Canario de la Salud, in its daily report published that there were 414 positive cases registered on the first day of the study period, being 93 of these health professionals (22.46%). These numbers almost tripled a week later, with 252 healthcare workers infected (representing almost 20% of the 1262 cases registered until March 28).20

Beliefs

Our participants are optimistic and confident about having access to preventive treatments as a vaccine when it will develop. However, the 82.7% of them didn’t believe they have adequate protective equipment to protect themselves from pandemic disease. These data are much higher than those found in a similar study conducted in the UK, where nurses and midwives recognized that PPE weren’t always available only in a 25%.21 Throughout the pandemic, the evidence on PPE has changed and aerosol protection is now recommended.22

We would like to highlight that a high proportion of participants felt unprotected against COVID-19 and believed that they were not being provided with suitable PPEs, with those working in social-healthcare centers, living with parents or younger than 30 feeling the most unprotected. The latter ones could possibly be afraid to transmit and spread the disease to relatives at risk (since COVID-19 is most harmful for older adults and people with existing or chronic diseases). Thus, a study on the psychological impact of COVID-19 on Chinese health professionals revealed that up to 40% of them developed psychological distress due to their concern on infecting their families and because of the protective measures.23

This collective perception of vulnerability and lack of protection against the new coronavirus may be reinforced by the data published on the epidemiologic follow-up reports of the Ministry of Health or those of the Canary Islands Autonomous Community, where it was reflected that almost 20% of reported cases corresponded to healthcare professionals, the highest proportion worldwide in the studied period.20,24

The fact of having a high rate of infected among Spanish health professionals has led to study the explanatory factors that could explain the spread of SARS-COV-2 among them. Moreno-Casbas et al., through a survey addressed to all those healthcare workers who were declared positive in the SARS-COV-2 infection by laboratory test, asked them about the availability, use and perception of the correct
use of the PPEs in the 5 days before the test. Professionals expressed a shortage of certain equipment, especially FPP2/FPP3 masks, glasses, and full PPE, which suggests that at the beginning of the pandemic there were professionals without an adequate level of protection.\textsuperscript{25}

Nevertheless, a noticeable fourth part of participants declared that they would continue to work even in lack of suitable PPEs. They corresponded to what the New York Times called “Healthcare Kamikazes,” who could use rudimentary hand-made material not complying with established quality and safety standards, in order to go on working despite the risk.\textsuperscript{26}

\textbf{Attitudes}

Our findings allow us to affirm that Spanish healthcare professionals showed high commitment toward their job since, despite running a higher-than-usual infection risk most of them are ready to go on working. Furthermore, they expressed a feeling of responsibility since they were ready to work more hours if they were asked to, both at their workplace or a different one. These results were rather similar to earlier results recorded by our research team in 2017, in a study on the attitudes and beliefs of health workers and nursing students in a Spanish region during hypothetical pandemic influenza.\textsuperscript{17}

However, these professionals did not put their work before their family, since almost half of them declared that they would not work if there were a risk of infecting their loved ones. Similar results were also found among UK healthcare professionals, where the 92% are worried about the risks of infecting their families due to their clinical role.\textsuperscript{21} In addition, such results were also reported by Damery et al.,\textsuperscript{16} who demonstrated that a risk of infecting their family members was a determining factor for healthcare professionals to decide whether to go on working during a pandemic or not. Other authors like Ehrenstein et al.\textsuperscript{27} also observed that almost 30% of the personnel in a German health center considered it acceptable to abandon their workplace during a pandemic with the aim of protecting themselves or their families.

\textbf{Limitations}

The main limitation of this study is the sample size to get conclusions at a national level, there is an over-representation of a region in relation to the rest of the country. However, in the case of the Canary Islands, we have collected the largest part of the sample, it allows us to know the situation in the last week of March in that region, in one of the toughest moments of the pandemic.

\textbf{Recommendations}

Three strategies for improving the situation are here proposed:

First, since it has been observed that the “\textit{fear of infecting their cohabitating relatives}” is the key factor generating distress and anxiety among health professionals,
potentially causing the highest rates of work abandonment, spaces could be offered for them to recover after completing their working hours. It should be a place where they could be temporarily isolated and receive relief of their emotional load, as well as food and rest.28

Second, a plan should be prepared to tackle a large amount of delayed healthcare activities. It is essential to be aware that the response to this health crisis will go beyond its termination. Therefore actions are needed to deal with the post-crisis period, which include organizing, planning, scheduling, and coordinating all delayed non-urgent procedures that will be accumulated together with new healthcare demands.28

Finally, the impact of physical and psychological overload on healthcare professionals should be reduced. Healthcare institutions should establish suitable mechanisms and offer efficient responses to the foreseeable emotional consequences of this crisis. The current emotional overload is expected to produce a number of affective reactions and symptoms, anxiety and post-traumatic stress in healthcare professionals (secondary victims) in the 3 months following the termination of the crisis.28 This is estimated to affect, according to studies conducted in Hunan and Wuhan (China), a proportion of 10–15% professionals working in the Intensive Care and Resuscitation, Internal Medicine, Pneumology and Infectious Diseases departments, with the highest prevalence in nurses.23

Conclusions

It is concluded that Spanish healthcare professionals have enormous commitment toward their work and are ready to work during the pandemic even in lack of suitable PPEs with the consequent higher risk of infection at work.

However, they put the health of their relatives before their duties at work. Since this is a reason for many of them to consider abandoning work, it should be assessed by health managers at all times.

Declaration of conflicting interests

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Ethics approval

Ethical approval for this study was obtained from Comité de Ética de la Investigación/Comité de Ética de la Investigación con Medicamentos Hospital
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**Informed consent**

Written informed consent was obtained from all subjects before the study.

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**Data sharing statement**

Extra data is available by emailing the corresponding author at lsancabx@gobiernodecanarias.com.

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Luciano Santana-Cabrera, PhD MD, is a section chief of Intensive Care Unit of Complejo Hospitalario Universitario Insular Materno-Infantil de Gran Canaria, Canary Islands, Spain. He made his specialty in intensive medicine between the years 1992-1996 at Nuestra Señora del Pino-Sabinal Hospital (Las Palmas de Gran Canaria, Spain). Since then he has been working in the adult intensive care unit. He received his Ph.D. in Las Palmas de Gran Canaria University (2013). His main interest in research is related to critical care, emergency medicine and quality of healthcare processes. He has more than 100 articles in pubmed journals as author or co-author. He is also the author of 2 books and 5 book chapters on critical care medicine. Currently, He is an external reviewer for several journals on critical care medicine and member of the Editorial Board for two International Journals of Critical Illness and other Journal of Hospital Administration. He has achieved different awards for his research work. He was a participant in the process of elaboration of the project called “Implementation of a Quality Management System in the Intensive Medicine Service of the Insular University Hospital of Gran Canaria” which received the Annual Award for the Quality of Public Service and Best Practices in the Public Administration of the Autonomous Community of the Canary Islands of 2010.
## Annex

### Table 1. Personal and working profile in the sample.

| Personal and work characteristics          | n   | %    |
|--------------------------------------------|-----|------|
| **Gender**                                 |     |      |
| Male                                       | 236 | 24.3 |
| Female                                     | 735 | 75.7 |
| **Age**                                    |     |      |
| Younger than 30 years                      | 249 | 25.64|
| Between 31 and 50 years                    | 517 | 53.24|
| Older than 51 years                        | 205 | 21.11|
| **Country**                                |     |      |
| Spain                                      | 971 | 100  |
| Autonomous community                       |     |      |
| Andalusia                                  | 37  | 3.81 |
| Aragon                                     | 9   | 0.93 |
| Asturias                                   | 3   | 0.31 |
| Balearic Islands                           | 6   | 0.62 |
| Canary Islands                             | 642 | 66.12|
| Cantabria                                  | 11  | 1.13 |
| Castile and Leon                           | 69  | 7.11 |
| Castile-La Mancha                          | 10  | 1.03 |
| Catalonia                                  | 25  | 2.57 |
| Valencia community                         | 45  | 4.63 |
| Extremadura                                | 10  | 1.03 |
| Galicia                                    | 29  | 2.99 |
| Madrid community                            | 51  | 5.25 |
| Murcia                                     | 2   | 0.21 |
| Navarre                                    | 5   | 0.51 |
| Basque country                             | 14  | 1.44 |
| La Rioja                                   | 3   | 0.31 |
| **Current cohabitation status**            |     |      |
| Living with partner and children           | 419 | 43.15|
| Living with partner without children       | 237 | 24.41|
| Living alone                               | 131 | 13.49|
| Living with parents or other relatives     | 184 | 18.95|
| **Activity**                               |     |      |
| Physician                                  | 248 | 25.54|
| Nurse                                      | 505 | 52.01|
| Nursing assistant                          | 130 | 13.39|
| Physiotherapist                            | 88  | 9.06 |
| **Workplace**                              |     |      |
| Emergency department                       | 103 | 10.61|
| Intensive care unit (ICU)                  | 133 | 13.7 |
| Operation room                             | 44  | 4.53 |
| Resuscitation                              | 4   | 0.41 |
| Hospitalization (all hospital areas included) | 416 | 42.84|
| Social-healthcare center                   | 90  | 9.27 |
| Healthcare center                          | 181 | 18.64|
| **Healthcare industry**                    |     |      |
| Public                                     | 804 | 82.8 |
| Private                                    | 167 | 17.2 |
Table 2. Beliefs of healthcare professionals during the COVID-19 pandemic.

| Beliefs                                                                 | Yes      | No        | Do not know |
|------------------------------------------------------------------------|----------|-----------|-------------|
|                                                                        | n        | n         | n           |
|                                                                        | %        | %         | %           |
| Do you think that a vaccine against the pandemic disease will be developed? | 706      | 125       | 140         |
|                                                                        | 72.71    | 12.87     | 14.42       |
| If such a vaccine existed, do you think that you would have access to it? | 622      | 94        | 255         |
|                                                                        | 64.06    | 9.68      | 26.26       |
| Do you think that you have been provided with suitable PPEs to protect you against the pandemic disease? | 119      | 803       | 49          |
|                                                                        | 12.26    | 82.7      | 5.05        |
### Table 3. Attitudes of healthcare professionals during the COVID-19 pandemic (I).

| Statements                                                                 | Probable | Do not know | Not probable | Not applicable |
|---------------------------------------------------------------------------|----------|-------------|--------------|----------------|
| n                           | %        | n           | %            | n              | %              |
| If there were a higher-than-usual risk of becoming infected at work and getting ill. | 606      | 62.4        | 158          | 16.2           | 186            | 19.16         | 21             | 2.1            |
| If there were a higher-than-usual risk of infecting your family.          | 274      | 28.22       | 228          | 23.48          | 452            | 46.55         | 17             | 1.75           |
| If you were asked to undertake additional tasks for which you have not been trained. | 408      | 42.02       | 232          | 23.89          | 323            | 33.26         | 8              | 0.82           |
| If you have to work with suitable PPEs (FFP2 or FFP3 mask, gloves complying with UNE-EN ISO 374.5:2016, eye and face protection, protective clothes). | 906      | 93.31       | 35           | 3.6            | 28             | 2.88          | 2              | 0.21           |
| If you have to work without suitable PPE.                                | 229      | 23.58       | 227          | 23.38          | 505            | 52.01         | 10             | 1.03           |
| If you were asked to work more hours.                                    | 815      | 83.93       | 86           | 8.86           | 66             | 6.8           | 4              | 0.41           |
| If a person cohabitating with you gets ill.                              | 304      | 31.31       | 254          | 26.16          | 391            | 40.27         | 22             | 2.27           |
| If you were asked to work in a hospital or healthcare center different from usual. | 697      | 71.78       | 146          | 15.04          | 118            | 12.15         | 10             | 1.03           |
| If you had to make decisions on who is admitted to the ICU and who is not. | 339      | 34.91       | 274          | 28.22          | 245            | 25.23         | 113            | 11.64          |
| If you had to work with students or retired workers.                     | 704      | 72.5        | 154          | 15.86          | 105            | 10.81         | 8              | 0.82           |
| If your coworkers got infected with the disease.                         | 657      | 67.66       | 182          | 18.74          | 124            | 12.77         | 8              | 0.82           |

During this pandemic, with what probability would you be more predisposed to work in the following situations?
Table 4. Attitudes of healthcare professionals during the COVID-19 pandemic (II).

| Statements                                                                 | Agree n | %   | Disagree n | %   |
|----------------------------------------------------------------------------|---------|-----|------------|-----|
| Healthcare personnel must care for those who are ill, even when they or their families are at a higher risk of infection. | 616     | 63.44 | 355        | 36.56 |
| Healthcare personnel should receive diagnosis and treatment before the general population during the pandemic. | 822     | 84.65 | 149        | 15.35 |
| All health workers have a duty to work during the pandemic even though there is an increased risk to their health. | 679     | 69.93 | 292        | 30.07 |
| Healthcare workers should be allowed to refuse to work with infected patients or near them. | 309     | 31.82 | 662        | 68.18 |
| Those who refuse to work during this health crisis should be penalized in some way. | 443     | 45.62 | 528        | 54.38 |
| Responsibility at work is before your family duties. | 302     | 31.1  | 669        | 68.9  |
| Health workers who care for/treat COVID-19 positive patients may refuse to work if they do not have suitable PPE. | 901     | 92.79 | 70         | 7.21  |

Please indicate if you agree or disagree with the following statements.