An analysis of the Educational Environment at the Malta Foundation Programme using the Postgraduate Hospital Educational Environment Measure (PHEEM).

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Research Article

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Abstract

Background Learning from managing patients in a real-world context is by far superior to simulation learning. A substandard educational environment is associated with poor patient care and suboptimal learning outcomes. The measurement of the educational environment provides an insight on what is needed to improve the level of training.

Methods This study used the Postgraduate Hospital Educational Environment Measure (PHEEM) to measure the educational environment at the Malta Foundation Programme. Descriptive statistics were used to describe the demographics of the study population. Non-parametric comparative statistics were used to identify statistically significant differences between groups.

Results 98 trainees out of 370 (26.5%) completed the online questionnaire. These consisted of 39 FY1s (31.5% of 124), 33 FY2s (24.8% of 133) and 26 Extended FYs (23.0% of 113). The 40-item PHEEM showed good reliability with a Cronbach’s $\alpha$ value of 0.912. These doctors have perceived their educational environment as more positive than negative. There seems to be a dip midway through training with an improvement towards the end of the two-year training period. The three worst scoring items seem to be related to when the trainees are on call.

Conclusion Perceptions of role autonomy and of social support are areas where most work is needed. Teaching seems to be moving in the right direction but there is always room for improvement.

Introduction

For healthcare professionals, there is no substitute to learning in the clinical environment (Nordquist et al., 2019). Learning from managing patients in a real-world context is by far superior to simulation learning. Over the past three decades, the subject of the educational environment, both at undergraduate and at postgraduate level, has been the focus of much research and discussion among all stakeholders in medical education. Both the GMC (2016) and Kilty et al. (2017) have underlined that a substandard educational environment is associated with poor patient care and suboptimal learning outcomes. Not only do young trainees learn from their work with patients, but patient care would suffer were these trainees to be removed from teaching organisations as their work is essential for any healthcare organization. This is further confirmed by the GMC (2016) when it states: “patient safety is inseparable from a good learning environment and culture that values and supports learners and educators”. The educational environment is, therefore, considered an important measure in both undergraduate and postgraduate medical training.

Postgraduate medical trainees have a dual contrasting role. On the one hand they are trainees, transitioning to hospital life, still in need of support and still adapting to their new responsibilities. On the other hand, as practicing doctors they need to provide answers to patients’ questions, work long hours, be accountable for their actions and may find inadequate support from their more senior colleagues. Trainees may feel under constant evaluation by their patients, colleagues and senior grades. This dual role is known to increase the risk of stress, anxiety, depression and burnout (Papaefstathioiu et al., 2019). Medical trainees are known to be one of the most vulnerable categories of employee to occupational stress (Antoniou, Davidson and Cooper, 2003)

The MACY Foundation (2018) sees the educational environment as:
“the social interactions, organizational cultures and structures, and physical and virtual spaces that surround and shape participants’ experiences, perceptions, and learning.” (Irby, 2018)

The American Medical Association defines educational environment as:

“a social system that includes the learner, the individuals with whom the learner interacts, the setting(s) and purpose(s) of the interaction, and the formal and informal rules/policies/norms governing the interaction” (Delva et al., 2004)

These definitions, among others, identify the complexity of the educational environment when compared to education in a class room.

The measurement of the educational environment provides an insight on what is needed to improve the level of training. This is done by identifying the weaknesses and strengths of a training programme and which areas should be prioritized in any improvement that is planned.

For many years, the educational environment was ignored, possibly because of the lack of suitable and validated instruments that could be used to assess it. This has now changed and a number of validated instruments to assess the different aspects or domains of the educational environment. One of the first to be developed was the Dundee Ready Education Environment Measure (DREEM) (Roff et al., 1997). DREEM uses five subscales in its evaluation of the education environment:

- Students’ perception of learning
- Students’ perception of teachers
- Students’ academic self-perceptions
- Students’ perceptions of atmosphere
- Students’ social self-perceptions

Following DREEM a number of other instruments aimed at assessing the education environment in different settings were developed and validated. These include PHEEM (Postgraduate Hospital Education Environment Measure) (Roff, McAleer and Skinner, 2005), ATEEM (Anaesthetic Theatre Education Environment Measure) (Holt and Roff, 2004) and STEEM (Surgical Operating Theatre Education Environment) (Cassar, 2004). The PHEEM will be discussed in more detail at a later stage.

With the use of different measures of the education environment now widespread in the literature, such instruments can be used to gain holistic views of the curriculum, understand the students’ perceptions of learning, teaching and the atmosphere, compare the different perceptions of the various stakeholders, compare environments between schools or departments, provide organisations with indications of what needs to be changed or improved and to evaluate the results of any changes made on the education environment (Harden and Laidlaw, 2020).
The Malta Foundation Programme was founded in 2009. As the Malta Foundation Programme (MFP) bases its operations on the same Reference Guide, while offering the same Curriculum and training opportunities as the UK Foundation Programme (UKFPO), the MFP was awarded the status of Affiliate Programme by the UK Foundation Programme. This status has ensured that trainees of the MFP, upon completion of their programme, can compete on the same level as those completing the UK Foundation Programme for training posts in specialities in Malta, the UK or elsewhere. This affiliation has since been renewed at regular intervals after the MFP repeatedly fulfilled the Quality Standards of the Malta Medical Council and the UKFPO. (MFP, 2020).

**Methodology**

A cross-sectional observational method was chosen for this study of the educational environment and burnout among Foundation Doctors in Malta.

The instrument chosen to assess the educational environment is the Postgraduate Hospital Education Environment Measure (PHEEM) questionnaire administered online through Google Forms to all doctors within the Malta Foundation Programme. The PHEEM questionnaire has been validated in various settings and in different countries. Minor changes were made to the wording of the questionnaire to ensure that each question is relevant to the Maltese setting. Direct correspondence with the original author of the PHEEM questionnaire ensured permission to use and validity of the minor changes to the wording.

PHEEM was administered in English as all medical tuition in Malta is carried out in English. The questionnaires were distributed to all Foundation Programme doctors via their year representatives in the form of a Google Form online questionnaire. As the Foundation Programme does not offer the service of forwarding emails directly, the questionnaire was initially be sent to the Foundation School Secretary who then passed it on to the foundation doctors’ representatives. A reminder was sent after seven days aiming at increasing the response rate. All respondents were requested to submit solely a single reply especially as this was an anonymous questionnaire. The period of data collection coincided in a period when three cohorts of Foundation Doctors could be sampled. The first years were sampled at the end of their first rotation, three months into practising. The second years were sampled between their first and second years, a year into practising. A third category, though technically not under the responsibility of the Foundation Programme, were the extended Foundation doctors. These were doctors who had successfully finished their Foundation training and were waiting for their BST posts to be decided. These trainees were sampled at the end of their two-year Foundation training. The sampling period ran between July and August 2020 for FY2s and extended FYs, and in October 2020 for FY1s.

A covering letter and a participant information sheet accompanied the questionnaire. Informed consent was obtained from all participants. All methods were carried out in accordance with relevant guidelines and regulations. The deadline for the collection of data was two weeks after the reminder was sent.

Ethical approval was obtained from the University of Malta Faculty Research Ethics Committee and approval to disseminate the questionnaire was obtained from the Malta Foundation Programme.
The responses were analysed using SPSS 25.0. Questions 7,8,11 and 13 are negatively worded statements and needed to be reversed for scoring. Reliability tests of the whole instruments and the three factors was performed using Cronbach's alpha. Descriptive statistics were used to describe the demographic features of the respondents. Tests for normality (Komogorov-Smirnov and Shapiro-Wilk) for all factors revealed that no question was normally distributed. Therefore, all comparative statistics were of the non-parametric type. The Mann-Whitney U test was used to analyse differences between genders. The Kruskall-Wallis H test was used to test for differences between Foundation years. The threshold for statistical significance was a p < 0.05 and 95% confidence interval. Factor analysis of all 40 items was also performed using both the scree plot and a criterion of an eigenvalue >1.

**Results**

**Demographics**

98 trainees out of 370 (26.5%) completed the online questionnaire. These consisted of 39 FY1s (31.5% of 124), 33 FY2s (24.8% of 133) and 26 Extended FYs (23.0% of 113). 71.4% were aged between 23 and 25 years. 60.2% were female and 94.9% were single. 87.8% were Maltese. 86.7% worked in excess of the 48-hour week stipulated in the European Working Time Directive.

**Internal Consistency**

The 40-item PHEEM showed good reliability with a Cronbach's $\alpha$ value of 0.912. Cronbach's $\alpha$ for each of the three subscales of the PHEEM were as follows:

- Autonomy – 0.790
- Teaching – 0.885
- Social support – 0.683

**Item analysis**

Table 1 summarizes the responses to each of the 40 questions according to year of training.

*Table 1* summarizes the responses to each of the 40 questions according to year
| No. | Question                                                                                           | FY1s Mean | FY1s SD | FY2s Mean | FY2s SD | Extended FYs Mean | Extended FYs SD | Total Mean | Total SD |
|-----|----------------------------------------------------------------------------------------------------|-----------|---------|-----------|---------|------------------|----------------|------------|----------|
| 1   | I have a contract of employment that provides information about hours of work                     | 2.36      | 0.932   | 1.61      | 1.223   | 1.62             | 1.061          | 1.91       | 1.122    |
| 2   | My clinical teachers set clear expectations                                                      | 2.59      | 0.938   | 2.48      | 0.870   | 2.12             | 1.071          | 2.43       | 0.963    |
| 3   | I have protected educational time in this post                                                    | 1.82      | 1.189   | 1.67      | 1.267   | 1.92             | 1.383          | 1.80       | 1.260    |
| 4   | I have an informative induction programme                                                         | 2.36      | 1.088   | 1.82      | 1.044   | 2.12             | 1.033          | 2.11       | 1.073    |
| 5   | I have the appropriate level of responsibility in this post                                      | 2.49      | 0.914   | 2.06      | 1.116   | 2.42             | 1.027          | 2.33       | 1.023    |
| 6   | I have good clinical supervision at all times                                                     | 2.87      | 0.978   | 2.39      | 1.171   | 2.69             | 1.158          | 2.66       | 1.102    |
| 7   | There is racism in this post                                                                      | 2.44      | 1.188   | 2.48      | 1.093   | 2.62             | 1.359          | 2.50       | 1.195    |
| 8   | I have to perform inappropriate tasks                                                            | 2.00      | 1.051   | 1.52      | 1.093   | 1.69             | 1.289          | 1.76       | 1.140    |
| 9   | There is an informative Junior Doctors handbook                                                   | 1.82      | 1.023   | 2.30      | 1.132   | 2.27             | 1.002          | 2.10       | 1.070    |
| 10  | My clinical teachers have good communication skills                                               | 2.85      | 0.875   | 2.79      | 0.820   | 2.65             | 1.056          | 2.78       | 0.903    |
| 11  | I am bleeped inappropriately                                                                     | 1.13      | 1.005   | 0.58      | 0.902   | 0.96             | 1.399          | 0.90       | 1.108    |
| 12  | I am able to participate actively in educational events                                           | 2.36      | 0.778   | 2.06      | 0.864   | 1.96             | 0.958          | 2.15       | 0.866    |
| 13  | There is sex discrimination in this post                                                          | 2.56      | 1.142   | 2.61      | 1.197   | 2.77             | 1.243          | 2.63       | 1.179    |
| 14  | There are clear clinical protocols in this post                                                    | 2.85      | 0.432   | 2.58      | 0.969   | 2.69             | 0.838          | 2.71       | 0.760    |
| 15  | My clinical teachers are enthusiastic                                                             | 2.54      | 0.884   | 2.30      | 1.015   | 2.38             | 0.983          | 2.42       | 0.852    |
| 16  | I have good collaboration with other doctors in my grade                                           | 3.21      | 0.695   | 3.42      | 0.561   | 3.35             | 0.562          | 3.32       | 0.619    |
| 17  | My hours conform to the European Working Time Directive                                          | 1.03      | 1.013   | 0.64      | 1.025   | 0.62             | 0.983          | 0.79       | 1.018    |
| 18  | I have the opportunity to provide continuity of care                                              | 2.33      | 0.898   | 1.94      | 1.197   | 2.58             | 0.945          | 2.27       | 1.041    |
| 19  | I have suitable access to careers advice                                                         | 1.85      | 1.040   | 1.67      | 1.137   | 1.64             | 0.810          | 1.73       | 1.016    |
| 20  | This hospital has good quality accommodation for junior doctors, especially when on call         | 2.08      | 1.178   | 1.45      | 1.325   | 1.73             | 1.218          | 1.78       | 1.256    |
|   | Description                                                                 | Value1 | Value2 | Value3 | Value4 | Value5 | Value6 |
|---|-----------------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|
| 21 | There is access to an educational programme relevant to my needs            | 2.31   | 0.766  | 1.94   | 1.116  | 1.92   | 1.038  |
| 22 | I get regular feedback from seniors                                         | 2.28   | 1.123  | 2.30   | 0.984  | 2.31   | 1.011  |
| 23 | My clinical teachers are well organised                                     | 2.61   | 0.823  | 2.30   | 1.075  | 2.27   | 0.962  |
| 24 | I feel physically safe within the hospital environment                      | 2.62   | 0.963  | 2.45   | 1.003  | 2.38   | 0.983  |
| 25 | There is a no-blame culture in this post                                    | 1.62   | 1.161  | 1.33   | 1.242  | 1.19   | 1.234  |
| 26 | There are adequate catering facilities when I am on call                    | 1.15   | 1.014  | 0.70   | 0.951  | 0.62   | 0.898  |
| 27 | I have enough clinical learning opportunities for my needs                  | 2.05   | 1.025  | 1.91   | 1.146  | 2.00   | 1.080  |
| 28 | My clinical teachers have good teaching skills                              | 2.74   | 0.751  | 2.61   | 0.899  | 2.58   | 0.902  |
| 29 | I feel part of a team working here                                          | 2.92   | 0.870  | 2.75   | 0.718  | 2.77   | 0.992  |
| 30 | I have opportunities to acquire the appropriate practical procedures for my grade | 2.41   | 0.850  | 2.03   | 1.132  | 2.19   | 1.021  |
| 31 | My clinical teachers are accessible                                         | 2.82   | 0.970  | 2.64   | 0.994  | 2.58   | 0.703  |
| 32 | My workload in this job is fine                                             | 2.08   | 1.085  | 1.48   | 1.176  | 2.15   | 1.190  |
| 33 | Senior staff utilise learning opportunities effectively                      | 2.49   | 0.885  | 2.21   | 0.857  | 2.23   | 0.951  |
| 34 | The training in this post makes me feel ready to be a BST                   | 1.67   | 0.737  | 1.58   | 1.062  | 1.96   | 1.113  |
| 35 | My clinical teachers have good mentoring skills                              | 2.64   | 0.932  | 2.67   | 0.736  | 2.38   | 0.804  |
| 36 | I get a lot of enjoyment out of my present job                              | 2.38   | 0.935  | 2.06   | 1.116  | 2.12   | 1.071  |
| 37 | My clinical teachers encourage me to be an independent learner               | 2.79   | 0.801  | 2.76   | 0.902  | 2.73   | 0.724  |
| 38 | There are good counselling opportunities for junior doctors who fail to complete their training satisfactorily | 1.87   | 0.656  | 1.30   | 0.883  | 1.58   | 0.987  |
| 39 | The clinical teachers provide me with good feedback on my strengths and weaknesses | 2.26   | 1.093  | 2.09   | 1.208  | 2.46   | 1.174  |
| 40 | My clinical teachers promote an atmosphere of mutual respect                 | 3.00   | 0.946  | 2.64   | 0.962  | 2.46   | 1.067  |
Table 2 illustrates the cumulative scores for the three themes and for the total PHEEM score for each of the three cohorts assessed in this study.

**Table 2 Scores for the three PHEEM themes and total score**

|                                | FY1   | FY2   | Ext. FY | Total  |
|--------------------------------|-------|-------|---------|--------|
| **Perceptions of Role Autonomy** | 30.44 | 25.42 | 28.50   | 28.23  |
| 0-14 Very poor                 |       |       |         |        |
| 15-28 A negative view of one's role |       |       |         |        |
| 29-42 A more positive perception of one's role |       |       |         |        |
| 43-56 Excellent perception of one's job |       |       |         |        |
| **Perceptions of Teaching**    | 34.46 | 31.61 | 32.00   | 32.85  |
| 0-15 Very poor quality         |       |       |         |        |
| 16-30 In need of some retraining |       |       |         |        |
| 31-45 Moving in the right direction |       |       |         |        |
| 46-60 Model teachers           |       |       |         |        |
| **Perception of Social Support** | 26.26 | 23.82 | 23.88   | 24.81  |
| 0-11 Non-existent              |       |       |         |        |
| 11-22 Not a pleasant place     |       |       |         |        |
| 23-33 More pros than cons      |       |       |         |        |
| 34-44 A good supportive environment |       |       |         |        |
| **Overall Score**              | 92.15 | 81.97 | 85.46   | 86.95  |
| 0-40 Very poor                 |       |       |         |        |
| 41-80 Plenty of problems       |       |       |         |        |
| 81-120 More positive than negative, but room for improvement |       |       |         |        |
| 121-160 Excellent              |       |       |         |        |
The authors of PHEEM (Roff et al., 2005) recommend that any item with a mean of 2 or less should be examined in detail as it may indicate a problem area. Table 3 provides a summary of the items with a mean total score below 2 for the three cohorts in the study. The items have been arranged in ascending order.

Table 3 – Summary of the items with a mean total score below 2 for the three cohorts in the study. The items have been arranged in ascending order.

| No. | Question                                                                 | Mean | SD    |
|-----|--------------------------------------------------------------------------|------|-------|
| 17  | My hours conform to the European Working Time Directive                   | 0.79 | 1.018 |
| 26  | There are adequate catering facilities when I am on call                 | 0.86 | 0.984 |
| 11  | I am bleeped inappropriately                                             | 0.90 | 1.108 |
| 25  | There is a no-blame culture in this post                                 | 1.41 | 1.209 |
| 38  | There are good counselling opportunities for junior doctors who fail to complete their training satisfactorily | 1.60 | 0.858 |
| 34  | The training in this post makes me feel ready to be a BST                | 1.71 | 0.963 |
| 19  | I have suitable access to careers advice                                | 1.73 | 1.016 |
| 8   | I have to perform inappropriate tasks                                   | 1.76 | 1.140 |
| 20  | This hospital has good quality accommodation for junior doctors, especially when on call | 1.78 | 1.256 |
| 3   | I have protected educational time in this post                           | 1.80 | 1.260 |
| 32  | My workload in this job is fine                                          | 1.90 | 1.171 |
| 1   | I have a contract of employment that provides information about hours of work | 1.91 | 1.122 |
| 27  | I have enough clinical learning opportunities for my needs              | 1.99 | 1.071 |

There was only one question that was rated >3 by the three cohorts “I have good collaboration with other doctors in my grade”. Another question, “My clinical teachers promote an atmosphere of mutual respect” was rated 3.00 by Foundation Year 1 respondents. The original authors of PHEEM have suggested that items with a mean score 3.5 or over are real positive points. None were identified in this study.

Statistically significant differences between genders were identified on seven items as listed in Table 4. In general, females seemed to give higher rankings in almost all of the seven items. The only exception is the question regarding sex discrimination at the workplace.

Table 4 – items with statistical significance between genders.
Statistically significant differences between Foundation-year cohorts were identified in five items using the Kruskall-Wallis H test. These results are illustrated in Table 5.

**Table 5** - items with statistical significance between years of training.

|                                          | Foundation Year | N  | Mean Rank | Kruskall-Wallis H | df  | Asymp. Sig. |
|------------------------------------------|-----------------|----|-----------|-------------------|-----|-------------|
| I have a contract of employment that provides information about hours of work. | Foundation year 1 | 39 | 50.46     | 10.477            | 2   | 0.005       |
|                                          | Foundation year 2 | 33 | 42.41     |                   |     |             |
|                                          | Extended Foundation | 29 | 42.06     |                   |     |             |
|                                          | Total            | 99 |           |                   |     |             |
| I am paged inappropriately               | Foundation year 1 | 39 | 57.81     | 7.155             | 2   | 0.028       |
|                                          | Foundation year 2 | 33 | 41.41     |                   |     |             |
|                                          | Extended Foundation | 29 | 47.31     |                   |     |             |
|                                          | Total            | 99 |           |                   |     |             |
| There are adequate catering facilities when I am on call | Foundation year 1 | 39 | 58.38     | 7.433             | 2   | 0.024       |
|                                          | Foundation year 2 | 33 | 44.58     |                   |     |             |
|                                          | Extended Foundation | 29 | 42.42     |                   |     |             |
|                                          | Total            | 99 |           |                   |     |             |
| My workload in this job is fine          | Foundation year 1 | 30 | 53.56     | 6.236             | 2   | 0.044       |
|                                          | Foundation year 2 | 33 | 39.85     |                   |     |             |
|                                          | Extended Foundation | 29 | 55.55     |                   |     |             |
|                                          | Total            | 98 |           |                   |     |             |
| There are good counselling opportunities for junior doctors who fail to complete their training satisfactorily | Foundation year 1 | 30 | 57.09     | 7.704             | 2   | 0.021       |
|                                          | Foundation year 2 | 33 | 40.68     |                   |     |             |
|                                          | Extended Foundation | 29 | 49.31     |                   |     |             |
|                                          | Total            | 98 |           |                   |     |             |

Generally speaking, mean scores seem to dip midway through the two-year training period, only to pick up again at the end of training, but never reaching the same levels as at the early stages of training.
Table 6- Factor analysis at Eigenvalue >1
| Component | Initial Eigenvalues       | Extraction Sums of Squared Loadings       |
|-----------|---------------------------|------------------------------------------|
|           | Total                     | % of Variance | Cumulative % | Total    | % of Variance | Cumulative % |
| 1         | 10.367                    | 25.917       | 25.917       | 10.367   | 25.917       | 25.917       |
| 2         | 3.258                     | 8.146        | 34.063       | 3.258    | 8.146        | 34.063       |
| 3         | 2.049                     | 5.123        | 39.186       | 2.049    | 5.123        | 39.186       |
| 4         | 2.016                     | 5.039        | 44.225       | 2.016    | 5.039        | 44.225       |
| 5         | 1.743                     | 4.357        | 48.583       | 1.743    | 4.357        | 48.583       |
| 6         | 1.625                     | 4.063        | 52.646       | 1.625    | 4.063        | 52.646       |
| 7         | 1.521                     | 3.803        | 56.449       | 1.521    | 3.803        | 56.449       |
| 8         | 1.302                     | 3.255        | 59.704       | 1.302    | 3.255        | 59.704       |
| 9         | 1.211                     | 3.028        | 62.732       | 1.211    | 3.028        | 62.732       |
| 10        | 1.151                     | 2.877        | 65.609       | 1.151    | 2.877        | 65.609       |
| 11        | 1.077                     | 2.691        | 68.300       | 1.077    | 2.691        | 68.300       |
| 12        | 0.976                     | 2.439        | 70.739       |          |              |              |
| 13        | 0.938                     | 2.345        | 73.085       |          |              |              |
| 14        | 0.886                     | 2.214        | 75.299       |          |              |              |
| 15        | 0.850                     | 2.126        | 77.425       |          |              |              |
| 16        | 0.779                     | 1.948        | 79.372       |          |              |              |
| 17        | 0.737                     | 1.843        | 81.216       |          |              |              |
| 18        | 0.676                     | 1.689        | 82.905       |          |              |              |
| 19        | 0.626                     | 1.565        | 84.469       |          |              |              |
| 20        | 0.610                     | 1.524        | 85.994       |          |              |              |
| 21        | 0.537                     | 1.342        | 87.335       |          |              |              |
| 22        | 0.504                     | 1.261        | 88.596       |          |              |              |
| 23        | 0.476                     | 1.190        | 89.787       |          |              |              |
| 24        | 0.458                     | 1.146        | 90.933       |          |              |              |
| 25        | 0.415                     | 1.038        | 91.971       |          |              |              |
| 26        | 0.387                     | 0.967        | 92.938       |          |              |              |
| 27        | 0.375                     | 0.937        | 93.874       |          |              |              |
| 28        | 0.325                     | 0.812        | 94.686       |          |              |              |
| 29        | 0.288                     | 0.721        | 95.406       |          |              |              |
Factor analysis

Principal component analysis of the 40 items making up the PHEEM questionnaire suggested the presence of 3 or 4 factors as identified by the inflexion of the points on the scree plot as seen in Figure 1.

Using a criterion of an eigenvalue $> 1$, 11 factors could be identified, accounting for 68.3% of the variance. The first factor had an eigenvalue of 10.367 accounting for 25.917% of the variance. The next ten factors had eigenvalues of $>3.26$, and explained 42.383% of the variance (see Table 6).

Discussion

The current study evaluates the Foundation doctors’ perception of the educational environment at the Malta Foundation Programme. These doctors have perceived their educational environment as more positive than negative. There seems to be a dip midway through training. However, rankings improve towards the end of the two-year training period albeit never reaching the rankings at the start of training. Perceptions of teaching and of social support ranked higher than perceptions of role autonomy. Trainees have demonstrated particularly low rankings in perceptions of role autonomy midway and at the end of training.

Interestingly, out of the 11 items with a mean score less than 2, six form part of the autonomy sub-scale, five form part of the social support subscale and only two were part of the teaching sub-scale.
The three worst scoring items seem to be related to when the trainees are on call. Malta persists with a system of on call duties that has been scrapped in many countries. Under the current conditions, Foundation doctors work for some 28 hours at a stretch. While adoption of the European Working Time Directive is part of Maltese law, Foundation doctors may feel that if they choose not to exceed 48 hours of work in a week, they may find themselves at a disadvantage when applying for training posts at a later stage in their career. On call duties are made worse by the lack of proper catering facilities on site and by an inordinate number of inappropriate pages.

Statistically significant differences between genders were identified on seven items as illustrated in Table 4. Five of these items form part of the perceptions of role autonomy sub-scale and two form part of the perceptions of social support sub-scale. Female trainees gave higher rankings in all seven items except in “There is sex discrimination in this post”. It is encouraging to note that female trainees do not perceive the educational environment at the Malta Foundation Programme to be sexually discriminatory.

Foundation Year 1 trainees scored significantly higher on five items as shown in table 5 (3 items in the autonomy subscale and 2 in the social support subscale). There seems to be a trend of deterioration in perceptions across all items and subscales as training reaches its midpoint. Perceptions then improve by the end of training but never reach the same levels of ranking achieved at the start of training. Whether this could be related to the development of burnout in trainees will be analysed in a further study.

In a similar local study, Farrugia Jones and Cacciotolo (2009) had assessed the postgraduate educational environment in the Department of Medicine, at Mater Dei Hospital, Malta. The response rate for house officers in this study was 10%. Problem areas identified by trainees in this study were: the absence of protected time, no access to an individual educational programme and working hours which do not conform with the European Working Time Directive. The same problems have, unfortunately, again been highlighted by this study. Poor catering facilities, poor access to career advice and counselling opportunities, a strong blame culture and an inappropriate workload were also replicated in the current study.

The benefits of a healthy educational environment are multiple. Studies have shown that the learning environment is associated with the quality of care provided (Tamblyn et al., 2005). The educational environment also influenced the prescribing habits of trainees (Cadieux et al., 2007) and the management and use of health care services and resources (Chen et al., 2014). In surgical training, higher rated surgical training programmes were associated with lower complication rates (Bansal et al., 2016).

The importance of having a high-quality clinical learning environment stems from the knowledge that a high-quality learning environment will have a direct impact on workplace learning and on the quality and safety of the clinical care received by patients. Ultimately a high-quality educational environment should translate into better patient outcomes. Trainees exposed to a high-quality clinical learning environment will have been exposed to participation in the clinical care of patients in a supervised manner. They will also be exposed to coaching, assessment and feedback, deliberate practice and peer collaboration (Kilty et al., 2017).

As noted earlier “patient safety is inseparable from a good learning environment and culture that values and supports learners and educators” (GMC, 2016). One needs to see this in the light that many trainees are meant to learn and develop their clinical skills in understaffed, underfunded, uncontrolled and overcrowded clinical
educational environments (Karanikolos et al., 2013; Di Somma et al., 2015). Exceeding a certain critical level of workload will result in a decline in trainee learning. Heavy workloads were found to be linked to a number of undesirable outcomes in trainees. These outcomes include increased likelihood of burnout and lower engagement, health and well-being (Visser et al., 2003; Jennings and Slavin, 2015). Lower levels of patient satisfaction, poor standards of care and a higher mortality were also associated with self-reported heavy workloads (Dixon-Woods et al., 2014; Reader and Gillespie, 2013).

**Limitations**

This study has limitations. The response rate was relatively low despite a reminder being sent. The quantitative nature of the study precludes an in-depth exploration of the reasons why trainees have the expressed perceptions. A qualitative additional study is warranted. The study was also carried out in a single centre albeit this is the only one on the island. The study did not take into account the effect of a pandemic on the educational environment.

**Conclusion**

This study was aimed at evaluating the educational environment at the Malta Foundation Programme. The first two years of postgraduate medical education signify a transition that can be rough and demanding as trainees are suddenly burdened with professional responsibilities. It is a period where learning has not ended with the undergraduate years but is only beginning in the postgraduate years.

The current study has identified areas in the educational environment where improvement is needed. Perceptions of role autonomy and of social support are areas where most work is needed. Teaching seems to be moving in the right direction but there is always room for improvement. Comparison with another local study has identified similar problem areas.

The study was conducted at a time where the COVID-19 pandemic was having its toll on the healthcare systems across the world. It may also have had an impact on the results of this study.

**Key Points**

1. Perceptions of the educational environment among trainees are at their lowest midway during the two-year duration of the Foundation Programme.
2. Doctors in Malta are still subjected to working long hours during the week and at a stretch. This seems to be having its toll on their perception of the educational environment.
3. Perceptions of teaching and of social support ranked higher than perceptions of role autonomy.
4. Female trainees do not perceive the educational environment at the Malta Foundation Programme to be sexually discriminatory.

**Declarations**

*Ethics approval and consent to participate*

Ethics approval was obtained from the Faculty Research Ethics Committee at the University of Malta. Permission to conduct the study was also obtained from the Foundation Programme, Malta. Informed consent was obtained
from all participants.

**Consent for publication**

I give my consent for the publication of the manuscript

**Availability of data and materials**

All data can be downloaded here:

https://doi.org/10.6084/m9.figshare.13215428.v1

**Competing interests**

No competing interests to report

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**Authors’ contributions**

Marco Grech was the sole contributor to this manuscript

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