Current management and training practices for UK dressage horses

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Abstract
There are many instructional texts for dressage management and training, but little scientific knowledge of these practices. It was hypothesized that there would be an effect of horse competition level on management and training. The objectives were to record rider, horse, management and training information from UK dressage horses and to investigate relationships between the variables. A questionnaire-based study was undertaken in all the UK-registered dressage horses. Data from 2554 respondents showed most riders in groups 7/6 with horses competed at novice medium and trained one level higher. Horses were 164–171 cm and warmbloods were the pre-dominant breed. Age and time in competition increased in training and competing from Preliminary to Prix St George. Horses competed twice per month except at Grand Prix (once per month). Most horses had 15–30 h turnout per week. Ninety-five per cent of horses received non-dressage exercise; hacking was the most common, then lunging and jumping. Non-elite horses were significantly more likely to be hacked/jumped than elite. Horses received dressage training three to four times a week, mean warm-up of 16 min and cool-down 11 min at all levels. Mean training duration was 36 min: 21% walk, 45% trot and 32% canter. Preliminary, Novice, Intermediare I and Grand Prix horses trotted most and cantered least in training. Overall, time spent in transitions (30–39%), specific movements (30–39%), working paces (40–49%), collected (10–19%) and extended (0–9%) varied between levels; elite horses spent more time in collected and less time in working than non-elite. Overall, there were differences in training and management practices between competition levels. This information provides baseline data on which to provide future advice.

Keywords: equine; dressage; training; exercise; stable management

Introduction
Dressage is rapidly growing in popularity as a sport in the UK, which involves great expense in both time and money. With the increasing number of new people entering into the sport, the passing on of knowledge about management and welfare of the horses is vital. The pressure to improve performance is immense, particularly at elite levels. Although there are many instructional texts for training and management of dressage horses, very little has been done to describe details of these practices. Limited epidemiological investigation has described details for training routines of German dressage horses1 and warm-up routines at dressage competitions in the UK2. Horses training at non-elite or elite level have different athletic requirements and musculoskeletal demands. A recent study has shown that horses undergoing dressage training and competing at non-elite and elite levels were at increased risk of specific injuries, in particular hind limb suspensory ligament injury, compared with general purpose horses and horses doing other sports3. Identifying differences in training or management in dressage horses at different competition levels may assist in understanding this. In order to improve welfare and performance, we need to know a baseline of what is being done with horses at present.

This study aimed to describe horse and rider features of management and training information for horses registered with British Dressage (BD) in 2005/2006. It was hypothesized that there would be an effect of horse competition level on management and training practices. The objectives were to record details of the type of horses competing in the UK at each level in dressage and their management and training routines, and to investigate any relationship between the variables.
Materials and methods

Information was compiled from a detailed pre-tested questionnaire sent to 11 363 registered owners of BD affiliated horses as an insert in the bimonthly BD magazine. This was mailed to owners of registered horses on 1 December 2005. A prize draw and postage-paid envelopes were used as incentives for questionnaire completion and return. As a questionnaire-based study, the analysis carried out on management, and particularly on training, is from owners'/riders' perceptions of what they do with their horses, rather than measured units. Each questionnaire was completed for one horse only where a respondent had more than one.

Horse and rider details

Details of horse and rider, horse management and training information were requested (Table 1). Rider grade was based on the BD classification from groups (G) 1-8, where G1 is the highest and G8 is the lowest. Horse level was classified on the BD competition scale starting from lowest to highest: Preliminary (P), Novice (N), Elementary (E), Medium (M), Advanced Medium (AM), Advanced (A), Prix St George (PSG), Intermediare I (Inter I), Intermediare II (Inter II) and Grand Prix (GP). Competition levels P, N, E and M were classed as non-elite and AM, A, PSG, Inter I, Inter II and GP were classed as elite. These levels were grouped into five competition groups (CG) for analysis as follows: CG1 (P and N); CG2 (E and M); CG3 (AM and A); CG4 (PSG and Inter I) and CG5 (Inter II and GP). Horse management (Table 1) included assessing time horses spent turned out per week rather than time in the stable, as this would reflect free time for the horse. Non-dressage exercises of hacking, lunging, jumping, horse walker and treadmill were assessed as combinations and time spent on each one. Warm-up and dressage training sessions were divided into time spent in each gait and variation within the gaits (Table 1).

Questionnaire processing

All questionnaires returned had staples removed and were stamped manually with a unique identification number per page at the time of arrival. Word recognition software (TELEform version 8.2) was used to transfer data from the questionnaires into a database. The scan station was used to scan each page of the questionnaire, which converted completed questionnaires into image batches that were subsequently verified and evaluated using TELEform Verifier. After identifying a form, Recoflex® recognition technology interpreted the unique handprint (ICR), machine print (OCR), bar code and checkbox (OMR) data entry fields. The function of TELEform Verifier was to perform image and batch quality control and hold forms for review if data were below 95% certainty. Incorrect data were manually corrected and handwritten answers entered. Following verification, the data were then automatically exported into a Microsoft Access 2000 database created by the program. Once all questionnaires had been entered, 10% were then re-entered in order to ascertain the level of repeatability for the TELEform program. Additionally, the same 10% were entered manually to establish the level of correlation between data read and interpreted by the program and the actual data. Error rate for double entry by computer was 1.8%, while manual entry against program entry was 5%.

Data analysis

Descriptive statistics were performed for each of the sets of data using a statistical software package (Analyse-It, version 3 for Microsoft Excel 2000). Data were tested for normality using a Shapiro–Wilks test. In order to answer the question of there being a difference in training and management procedures between competition levels, each question was analysed for the whole sample population, then further as non-elite and elite using a chi-squared test, Kruskal–Wallis with pairwise Conover contrast or ANOVA with pairwise Bonferroni contrast (P ≤ 0.05) as appropriate.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Information requested by questionnaire for details of horses, management and dressage training</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Horse details</strong></td>
<td><strong>Management details</strong></td>
</tr>
<tr>
<td>Sex</td>
<td>Shoeing</td>
</tr>
<tr>
<td>Breed</td>
<td>Turnout time</td>
</tr>
<tr>
<td>Height</td>
<td>Non-dressage exercise</td>
</tr>
<tr>
<td>Age</td>
<td>Time spent in non-dressage exercise</td>
</tr>
<tr>
<td>Current level of training</td>
<td>Combinations of non-dressage exercise</td>
</tr>
<tr>
<td>Current level of competition</td>
<td></td>
</tr>
<tr>
<td>Highest level of competition</td>
<td></td>
</tr>
<tr>
<td>Year at highest level of competition</td>
<td></td>
</tr>
</tbody>
</table>
Where a difference was seen between non-elite and elite, the appropriate test mentioned above was carried out between the five competition groups, then individual competition levels. The same process was carried out for the rider group levels. Data were presented either as a percentage or time in tables and histograms.

**Results**

The response rate to the questionnaires was 22%, providing 2554 subjects. Ninety-one per cent \( (n = 2278/2503) \) of respondents returned questionnaires for one horse, 8% \( (n = 209/2503) \) for two horses, 0.5% \( (n = 13/2503) \) for three horses and 0.1% \( (n = 3/2503) \) for four horses.

**Horse and rider details**

**Rider group**

From 2256 riders, 27% were group 7 \( (n = 616) \), 23% group 6 \( (n = 509) \), 16% group 5 \( (n = 363) \), 16% group 8 \( (n = 354) \), 9% group 3 \( (n = 204) \), 5% group 4 \( (n = 114) \), 2% group 2 \( (n = 49) \) and 2% group 1 \( (n = 47) \).

**Sex**

Geldings accounted for 69% of registered dressage horses \( (n = 1522/2203) \), mares 28% \( (n = 618/2203) \) and stallions 3% \( (n = 65/2203) \). Non-elite horses were 69% geldings \( (n = 1318/1922) \), 29% mares \( (n = 558/1922) \) and 2% stallions \( (n = 46/1922) \), while elite horses were 73% geldings \( (n = 204/281) \), 21% mares \( (n = 60/281) \) and 6% stallions \( (n = 17/281) \). Stallions were significantly more likely to be in the elite competition levels than in non-elite \( (P < 0.001) \).

**Breed**

Of dressage horses, 46% were warmblood \( (n = 1118/2453) \), 21% Thoroughbred cross \( (n = 520/2453) \), 20% other or of unknown breed \( (n = 492/2453) \), 8% Thoroughbred \( (n = 208/2453) \), 3% native ponies \( (n = 80/2453) \) and 1% other ponies \( (n = 35/2453) \). Elite horses were more likely to be warmblood than any other \( (P < 0.0001) \). Ponies, including native ponies, were more likely to be non-elite \( (P < 0.002) \).

**Height**

Height increased with competition level (Fig. 1), with the mean height of all competition levels at 165.13 cm (±7.77 cm). Horses competing at P \( (164 ± 8.5 \text{ cm}) \) and N \( (164.5 ± 9.2 \text{ cm}) \) were significantly lower in height than those at AM \( (197.2 ± 7 \text{ cm}) \) and PSG \( (167.8 ± 6.3 \text{ cm}) \) \( (P < 0.0001) \).

**Competition and training age**

Horses’ age increased with the level of competition class from P to GP, with the exception of Inter I horses, which dropped to a similar age as those at A (Fig. 2). There was a significant difference in the ages of horses competing in the five competition groups and at individual levels \( (P < 0.0001) \). A Bonferroni pairwise contrast showed the difference to be between horses at P and all levels above, N and all levels above, E and AM, E and PSG, M and AM, and M and PSG (Table 2).

The age at which horses trained increased up to PSG, reduced at Inter I and II and then increased again at GP (Fig. 2). There was a significant difference in the age of horses training at different levels \( (P < 0.0001) \). Horses training at P were significantly younger than those training at all levels above, as were horses training at N and E. Horses training at M were significantly younger than those training at A, PSG, Inter I and GP, but not at AM or Inter II. Those training at AM were of significantly lower age than

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**Fig. 1** Mean height of horses competing at different levels in dressage at Preliminary (P), Novice (N), Elementary (E), Medium (M), Advanced Medium (AM), Prix St George (PSG), Intermediate I (Inter I), Intermediate II (Inter II) and Grand Prix (GP). Subscripts ‘a’ and ‘b’ denote values for horses where height is significantly different between competition levels with corresponding letters \( (P < 0.0001) \).

**Fig. 2** Horses registered with British Dressage in 2005/6 showing the mean (± s.d) age of horses training and competing at Preliminary (P), Novice (N), Elementary (E), Medium (M), Advanced Medium (AM), Prix St George (PSG), Intermediate I (Inter I), Intermediate II (Inter II) and Grand Prix (GP). *denotes where horses training and competing at that level were significantly different in age \( (P < 0.0001) \).
horses training at PSG, Inter I and GP, but not at A or Inter II (Table 2).

The level a horse competed at had a strong correlation with the level it trained at ($P < 0.0001$), with $38\%$ ($n = 28/74$) to $67\%$ ($n = 4/6$) training one level above their current competition level. The exception was GP, where there was no higher level to train at. The age of horses training at each level was a mean of 0.2 years at M to 1.4 years at Inter II lower than the age of those competing at the same level with the exception of Inter I, where horses training at this level were older than those competing at the same level. Horses training at E and AM were significantly younger than those competing at these levels ($P < 0.0001$) (Fig. 2). Horses training at N to PSG and Inter II were older or at the same age as those competing at the level below. Horses training at Inter I and GP were younger than those competing at the previous level and of similar age to those competing two levels below.

Years in competition

The years in competition followed a similar pattern to the competition age, increasing from P (2.3 years ± 2.9) to PSG (7 years ± 4.1), decreasing at Inter I (6.3 years ± 3.1) and II (6.5 years ± 4.2) and then increasing again at GP (8 years ± 4.8).

Highest level of competition

The current competition level was the highest level at which 74% of horses had competed ($n = 1600/2160$); 19% were currently competing at one level below their highest ever ($n = 416/2160$) and 7% were competing at two to nine levels below their highest ever ($n = 144/2160$).

Competition frequency

The annual competition frequency overall is described in Table 3. When separated into competition levels the mean monthly competition was twice for all levels except GP, which was once. This was reflected in the annual competition frequency.

Table 3  Annual competition frequency of all dressage horses

<table>
<thead>
<tr>
<th>Number of competitions</th>
<th>Percentage of horses per year ($n = 1876$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–5</td>
<td>9</td>
</tr>
<tr>
<td>6–10</td>
<td>31</td>
</tr>
<tr>
<td>11–15</td>
<td>24</td>
</tr>
<tr>
<td>16–20</td>
<td>14</td>
</tr>
<tr>
<td>21–25</td>
<td>12</td>
</tr>
<tr>
<td>26–30</td>
<td>5</td>
</tr>
<tr>
<td>31 or more</td>
<td>5</td>
</tr>
</tbody>
</table>
**Horses’ previous occupation**

Of the entire sample population, 42% (n = 1058/2458) had no previous occupation. Elite horses were significantly more likely not to have had a previous career (P > 0.0001), with 49% (n = 300/607) of elite and 39% (n = 670/1718) of non-elite having only ever been used for dressage. Of the entire group that had a previous occupation, 17% (n = 435/2058) were from pony/riding club/pleasure, 16% (n = 403/2058) from eventing, 15% (n = 382/2058) from show jumping, 6% (n = 163/2058) other occupation, 2% (n = 44/2058) flat racing and 1% (n = 23/258) jump racing. Horses coming from a club and/or pleasure background were more likely to be non-elite than elite (P > 0.0001).

**Management of horses**

**Shoeing**

Of the sample population, 96% were shod in some way (n = 2358/2466). Of those that were shod, 91% had shoes on both front and hind feet (n = 1987/2178), 8% on the front feet only (n = 183/2178) and 1% on the hind feet only (n = 8/2178). There was no significant difference between non-elite and elite.

**Turnout time per week**

Grouping all the competition levels together showed that 2% (n = 51/2450) of dressage horses had no turnout, 9% (n = 225/2450) had over 90h a week and 3% (n = 82/2450) were out all the time. The majority of horses were turned out from 15 to 60h per week. Non-elite and elite turnout times reflected the pattern of the entire group (Fig. 3).

**Non-dressage exercise**

The overall proportion of horses that had non-dressage exercise additional to their dressage training was 95% (n = 2429/2554). Those that did not have non-dressage exercise were more likely to be elite than non-elite horses (P < 0.05); 9% (n = 25/292) of elite horses and 4% (n = 89/2032) of non-elite horses did not have additional non-dressage exercise.

![Fig. 3 Mean turnout time (hours per week) for non-elite and elite horses expressed as a proportion of the population](image)

<table>
<thead>
<tr>
<th>Exercise type</th>
<th>Proportion using exercise (%)</th>
<th>Hours per week</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>24</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>H + L</td>
<td>20</td>
<td>19</td>
<td>24</td>
</tr>
<tr>
<td>J + H + L</td>
<td>12</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>J + H</td>
<td>10</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>H + OEX</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>H + L + OEX</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>L</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>J + H + L + OEX</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>J + H + HW + L</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>H + HW</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>J + H + OEX</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>J + L</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

**Table 4** Proportion of non-elite and elite horses exercised by hacking, lunging, jumping, horse walker, treadmill or other non-dressage exercise and time spent per week

Of the entire group that had non-dressage exercise, hacking was the most used followed by lunging, jumping, other unspecified exercise, horse walker and treadmill in that order (Table 4). A significantly greater proportion of non-elite horses hacked and jumped while less used the horse walker than elite horses (P < 0.0001) as additional exercise. The difference remained significant for all three exercises at the five competition groups and at the individual competition levels (P < 0.005). The most frequently used combinations of non-dressage exercise by the entire sample group and as non-elite and elite groups are shown in Table 5. At individual competition levels, the pattern remained similar except for Inter II, where 83% (n = 5/6) combined hacking and lunging.

**Dressage training**

**Frequency**

Horses competing at P and GP levels were trained for dressage a mean of three times per week; all other levels had a mean of four training session per week.

**Table 5** Proportion of horses given different combinations of non-dressage exercise

<table>
<thead>
<tr>
<th>Non-dressage exercise combination</th>
<th>All horses (%)</th>
<th>Non-elite (%)</th>
<th>Elite (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n = 2554)</td>
<td>(n = 1942)</td>
<td>(n = 259)</td>
</tr>
<tr>
<td>H</td>
<td>24</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>H + L</td>
<td>20</td>
<td>19</td>
<td>24</td>
</tr>
<tr>
<td>J + H + L</td>
<td>12</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>J + H</td>
<td>10</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>H + OEX</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>H + L + OEX</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>L</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>J + H + L + OEX</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>J + H + HW + L</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>H + HW</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>J + H + OEX</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>J + L</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

H, hacking; L, lunging; J, jumping; HW, horse walker; OEX, other exercise. Non-elite = Preliminary, Novice, Elementary and Medium; Elite = Advanced Medium, Medium, Prix St Georges, Intermediare I and II and Grand Prix.
Warm-up
Total time spent warming up was a mean of 16 min (±6) for the entire group, which was reflected over the individual levels. The rider groups showed a significant difference in the total warm-up time (P < 0.02). RG1 had the longest duration (17.6 min ± 6), while RG2 and 6 had the shortest (14.9 min ± 6).

Mean time spent during warm-up in walk was 8 min (±4), trot 6 min (±4) and canter 5 min (±3). Elite horses spent significantly more time in canter during warm-up (5.1 min ± 2.7) than non-elite horses (4.5 min ± 3.5) (P < 0.002), which remained significant between the five competition groups and the competition levels (P < 0.0005), and appeared to be due to PSG horses having a longer canter time than others (mean 6.3 min ± 5.4). The horse walker was used as warm-up by 4% (n = 112/2554) of all horses for a mean time of 5 min (±9). Other unspecified forms of warm-up were used by 10% (n = 250/2554) of all horses for a mean time of 13 min (±9).

Training session time
Mean training time was 36 min (±11) for all the horses, with no significant difference between non-elite and elite horses. For the entire group, walk accounted for a mean 21% of the training session, trot 45% and canter 32%. There was a significant difference in the percentage of time spent at walk (P < 0.005), trot (P < 0.0001) and canter (P < 0.0001) at non-elite and elite, the five competition groups and the individual levels (Fig. 4).

Training paces
Training in walk. Walk accounted for the smallest proportion of a training session for all horses at all levels (21%). Non-elite horses spent a greater proportion of time in walk (21%) than elite horses (18%) (P < 0.0005); the five competition groups reflected this (P < 0.05), as did the individual levels (P < 0.05).

The mean percentage of training time walking between the rider groups was significantly different (P < 0.05), with a reduction from G8 (mean 22%) to G2 riders (mean 19%). G1 riders spent a similar proportion of time in walk to those in G7 (both mean 21%).

Training in trot. Non-elite horses trotted for a greater proportion of the training session (46%) than elite horses (39%) (P < 0.0001). The difference in the proportion of training spent in trot remained highly significant between the five competition groups and between the individual levels (P < 0.0001). A Bonferroni pairwise contrast showed that horses competing at P and N trained in trot significantly more than other levels except Inter II and GP. CG2 horses had a significantly greater percentage of training in trot than those in CG3 and CG4. This difference appeared to be due mainly to E horses’ greater proportion of trot rather than a combination of E and M.

The percentage of training in trot was significantly different between the rider groups (P < 0.0001). Riders in RG8 and 7 spent a significantly greater proportion of training time in trot than those in RG6, 5, 4 and 3 but not RG1. There was a reduction in percentage of training time in trot from RG8 (mean 48%) to RG2 (mean 39%), with RG1 spending a similar proportion of training in trot as RG6 (both mean 45%).

Training in canter. The proportion of training time in canter reflected that of trot in reverse. Non-elite horses cantered for a lesser proportion of the training session (31%) than elite horses (38%) (P < 0.0001). The difference in the percentage of training spent in canter remained highly significant between the five competition groups and the individual levels (P < 0.0001). A Bonferroni pairwise contrast showed horses competing at P and N cantered for a significantly lower percentage than those at other levels except Inter II and GP. Horses in CG2 cantered significantly less than those in both CG3 and CG4; this again appeared to be due to those at E having a significantly lesser percentage of canter than those in AM, PSG and Inter I. Although horses in CG5 cantered for a similar percentage to CG2, the difference between this group and others was not significant.

The percentage of training in canter was significantly different between the rider groups (P < 0.0001). Riders in RG8 spent a significantly smaller percentage of training time in canter than all other rider groups except RG1. RG3 and 4 spent a significantly higher percentage of training time in canter than RG5–8.

Training within paces and movements
The proportion of a training session spent performing specific movements, transitions and training within paces for each competition group is represented in Table 6.
Movements specific to competition level. The median proportion of training time allocated to movements specific to the horse's competition level was 30–39%. There was no significant difference between elite and non-elite horses or the rider groups in the proportion of time spent training on movements specific to the horse's competition level.

Working paces. The median proportion overall of training time spent in working paces was 40–49%. Elite horses spent a significantly lesser percentage of training in working paces than non-elite horses \((P < 0.0001)\). P and N horses had a significantly higher proportion of training in working paces than E \((P \text{ vs. } E, P < 0.005)\) to Inter I \((P < 0.0001)\). E horses trained in working paces significantly more than those up to Inter I \((E \text{ vs. AM, } P \leq 0.0001; E \text{ vs. PSG, } P \leq 0.015; E \text{ vs. Inter I, } P \leq 0.0027)\) (Table 6). Competitors in RG8 spent a median of 50–59% training in working paces, which was a significantly greater proportion than those in RG6 \((P \leq 0.0018)\), RG5 \((P \leq 0.0003)\), RG3 and RG4 \((P < 0.001)\). RG3 spent a significantly smaller proportion than those in RG6 \((P \leq 0.0009)\), RG7 and RG8 \((P < 0.0001)\), with a median of 30–39% of training in working paces.

Collected paces. For the entire group, the median proportion of time spent in collected paces was 10–19% of a training session. Elite horses spent a significantly larger percentage of training in collected paces than non-elite horses \((P < 0.0001)\). When divided into competition levels those in P and N had a significantly lower proportion of training spent in collected than those in the higher levels up to Inter I \((P \text{ vs. E, } P \leq 0.0003; P \text{ vs. M to Inte r I, } P \leq 0.0001; E \text{ vs. M, } P \leq 0.0025; E \text{ vs. AM, } P \leq 0.0003; E \text{ vs. A, } P \leq 0.0075; E \text{ vs. PSG, } P \leq 0.0005; E \text{ vs. Inter I, } P \leq 0.0023)\) (Table 6). There was a significant difference in the proportions of a training session spent in collected paces between the rider groups. This appeared to be greatest between RG8 to 7 and those above from RG6 to 2 \((P < 0.0001)\). Those in RG1–3 spent a median of 20–29% training in collected paces, while the lower rider groups from RG4–8 spent a median of 10–19%.

Extended paces. The median proportion of a training session spent in extended paces for the entire group was 0–9%. There was a significant difference between the five competition groups in the proportion of the training session spent in extended paces \((P < 0.05)\). Those in CG3 (AM and M) had a median of 10–19% compared with 0–9% of the other groups.

Transitions. For the entire group, the median proportion of a training session spent working on transitions was 30–39%. There was a significant difference between the rider groups, with those in RG8 appearing to use transitions the most. A Conover contrast test showed a significant difference only between RG6 and 8 \((P < 0.05)\).

Cooling down

All horses were given a mean of 11 min \((± 5)\) for cooling down, with a significant difference between
non-elite (10.5 min ± 4.5) and elite (11 min ± 4.6) 
(P = 0.04). Between rider groups there was a significant 
difference in time spent cooling down (P = 0.0004), 
with the top three rider groups, RG1, 2 and 3, spending 
11.5–12.3 min and those in RG4, 5, 6, 7 and 8 spending 
10.0–10.8 min. A Conover contrast test showed the differ- 
ences to be between RG1 and RG2; RG3 and RG6.

Discussion

This study successfully describes the details of the type 
of horses competing under BD registration and their 
management and training routines at the ten compe-
tition levels. There was a significant effect of the 
horses’ competition level on some individual horse fea-
tures, management and training practices that sup-
ports, the study hypothesis.

Horse and rider details

Elite horses were more likely to be tall, warmbloods, 
and stallions were more likely to be elite than non-
elite. The majority of horses bought for dressage 
were warmbloods, particularly those intended for 
international competition. This is not surprising as 
warbloods have been selectively bred for confor-
mational traits such as a larger hock angle and more 
sloping scapulas that have been correlated with good 
gait score for dressage. Thoroughbreds on the 
other hand have historically been bred for their ability 
to gallop and jump at speed. There was a trend for larger 
horses at the elite levels may be due to subjective 
expectations of the judges and fashionable following 
of the successful types winning at international 
levels. It is possible that there is an element of practi-
cality if the proportion of female to male riders is 
greater in non-elite or amateur classes than in elite or 
professional classes, where the majority of female 
riders would be more suited to a smaller horse.

The majority of dressage horses are broken at the age 
of 3 or 4 years and start competing at 4 or 5 years in 
young horse classes; the age in the current study 
then increased with the competition levels. In a pre-
vious report from Germany, horses were competing 
at L-level (equivalent to UK E-level) from the age of 
5 years and S-level (equivalent to UK AM and A levels) 
from 7 years. The current study indicated that horses 
as young as 4 years were competing in the UK at E and 
from 6 years at AM and A. The increasing age through 
the competition levels may be indicative of the time 
it takes to train a horse up through the grades, while 
allowing for the muscle development to keep up 
with demands. There is evidence that some change in 
adolescent muscle fibre is due to specific training 
alone and not growth, and training programmes have 
been shown to result in muscle adaptation from as 
early as 12 months old. The general recommendation 
of training at a higher level than a horse’s current compe-
tition level is supported by our study. The BD horses 
trained on average at one level higher than the level 
they competed and appeared to take c. 2 years to 
move up to the next level. This is indicated by the com-
petition age of horses being 2 years below those training 
at the same level. The age at which horses trained fol-
lowed a similar pattern to the competition age and stea-
dily increased to PSG, then decreased at Inter I and II and 
increased again at GP. This suggested that younger 
horses are training at elite level even if they are not com-
peted and possibly there is a greater demand being 
placed on the younger horses in the UK than previously 
thought. Horses competing at Inter I and II were found 
to have had less time in competition than PSG, support-
ing the theory that horses may be produced for 
elite levels at a younger age at home. It is also possible 
that there are a greater proportion of horses at lower 
levels in the UK that were never destined to be elite com-
petitors. The longer time in competition at PSG than 
Inter I and II may also be a reflection of horses reaching 
this level and not progressing any further.

This study suggests that the competition frequency 
of horses registered in the UK at non-elite level is 
greater than those in Germany, and the same at elite 
levels. The annual competition frequency for both 
non-elite and elite BD horses was 4% of the observed 
period compared with 2% for L-level and 4% for 
S-level German horses. It has been suggested that 
horses are trained with greater expectations at a 
younger age in continental Europe, especially for auc-
tions, possibly accounting for the lower competition 
frequency. Horses were on average worked for 
60 min at competition and 40 min in training during 
the German study, suggesting that horses have a 
larger volume of work at competitions than in train-
ing. A study of warm-up procedures in the UK indi-
cated that the mean time given to prepare for each 
test was overall 29 min 53 s and only 25 min 23 s at 
non-elite. Unfortunately, it was not stated how many 
tests were completed per horse during the day; if 
there was only one test involved, the UK dressage 
horses received less work at competition; if there 
were two, they would be similar to that described 
for the German horses. Given that a certain level of 
eyl and specific training is required for appropriate 
muscle adaptation and injury prevention, there is a 
reasonable argument for working younger horses at 
home and competing less.

Although, overall, a greater proportion of horses 
bad been used for another occupation before being 
used for dressage, 42% did not have any previous 
occupation. The high number of non-elite horses that
those in medium to heavy work. Horses confined to stables for as little as 7 days even with hay provided ad libitum can develop gastric ulceration, possibly due to altered eating behaviour compared with horses turned out for the same time. The majority of the respondent dressage horses in this study were stabled for 64–91% of the time, with surprisingly no difference between elite and non-elite. Those in medium to hard work and travelling regularly to competitions would potentially be at a greater risk of gastric damage, which may be avoidable by providing more turnout time. Stable confinement has also been indicated as detrimental to the growth of the musculoskeletal tissues. Although dressage horses are not completely confined to the stable, it is possible that standing still for long periods of time could have an impact on properties of bone and soft tissues.

The majority of all dressage horses did have non-dressage exercise additional to their training. Although specific training is important for appropriate muscle development for dressage, a variety in work is useful for both musculoskeletal adaptation and proprioceptive training. Human athletes have successfully used a combination of exercise routines on both stable and unstable surfaces for improving strength, power and proprioceptive conditioning. Core strength has been coined as important in human sports fitness for avoiding injury in lower and upper extremities. Even though it would not be advisable to exercise a horse on very unstable surfaces, the changes in footing and gradient experienced while out hacking, which is the most used additional exercise, possibly would mimic the same effect. Jumping is the third most used additional exercise and helps to improve core strength in horses by the nature of the muscle groups used to collect and propel upwards and forwards. The greater use of horse walkers and lesser use of hacking and jumping seen in the elite horses may be due to potentially unfounded concerns about damage from the latter activities. Interestingly, the opposite was found in German-trained horses, with an overall larger proportion of L-level horses being exercised without a rider than S-horses. The increasing value, in both time and money, of elite horses may result in BD owners being cautious of danger rather than seeing the physical benefits from these activities. Although lunging was the second most popular additional exercise, a very low proportion of horses had this on its own, with elite horses twice as likely to be lunged only as additional exercise than non-elite. The use of lunging as an additional exercise appears to be much more popular in the UK than that reported in Germany, with 50% of BD horses being lunged compared with 14% of L-horses and only 1% of S-horses. Interestingly, the mean time spent hacking of 3 h per week was only slightly lower than the time spent training of 4.9 h per week.

**Dressage training**

Warm-up time did not significantly differ across the levels and was much shorter in duration than previously described for competition warm-up. This is likely to be due to a training session warm-up consisting of a more generalized use of walk, trot and canter, whereas, although the competition warm-up will consist of this too, time will then be spent on more specific movements. Warm-up is only performance improving when it is not so intense as to cause fatigue. Therefore, as the training duration contributes to a greater proportion of the overall work time than performing a dressage test in competition, it stands to reason the time would be reduced. When warming up for competition an increase in duration was seen at higher levels compared with lower levels, which was not found in the current study at different horse levels. However, G1 riders spent a significantly longer time warming up than the lower-grouped riders, which may reflect rider experience or a difference in perception of warm-up and training. The main difference in warm-up content was a greater amount of canter at elite levels than non-elite, predominantly at PSG and GP. This pattern supports that found for competitive warm-up and suggests that warm-up content is appropriately guided by training requirements.

The overall training time for BD horses of 36 min was less than that of horses involved in the German study of 40 min for S-horses and 48 min for L-horses. However, there is no mention of warm-up time in the German paper. If this was included in a training unit, when warm-up is added to the BD training time a BD dressage training unit is longer at 52–58 min. Rider type did not appear to have an effect on the duration of training, unlike in the German study, where professional riders spent less time but a greater intensity on each horse than owners. Although the G1 riders spent marginally less time working in a training
session, they took longer warming up, and therefore the total time was similar overall to other rider levels.

Within the breakdown of the paces of dressage training, all horses spent the least time in walk, with elite horses having a lower proportion of walk in training than non-elite horses. This is in agreement with the German horses only in that the S-horses had a lower percentage of a training unit in walk than the L-horses. However, the L-horses spent 46.2% of training in walk, which was more than twice that given at BD equivalent levels. S-horses spent 21% of training in walk, which is comparable to the BE non-elite and 10% more than the BD equivalent level. At BD local, regional and national competitions, walk accounted for the greatest proportion of M, PSG and GP, and N at local competitions. At N, regional and national competitions walk made up the second largest proportion of a work unit. This suggests a dramatic difference between work given during training at home and that at a competition.

There appeared to be a closer relationship between proportion of training in trot and canter than these paces and walk. Trotting accounted for the greatest proportion of a BD horse’s training session for all levels except for Inter I, which were cantered for 41% and trotted for 38%. Non-elite horses had a significantly greater proportion of training in trot than elite horses, in contrast with the German horses, where L-horses had less trotting than S-horses. This appeared to be due to the much higher amount of walking given to the L-horses not seen in the BD horses. The trot/canter balance was similar for the BD and German horses in that a greater percentage of a training unit was taken up with trotting than cantering. Both studies showed that the difference between trot and canter proportion was greater for the non-elite and L-horses, while the elite and S-horses had only marginally less canter work than trot. The same pattern was reflected in BD competition warm-up. Within the elite horses, PSG spent more time in canter than trot when warming up for a competition and a similar time for each in a training session, while Inter I had more training in canter than trot. This reflects the demands of the dressage tests, where canter requirements increase at both these levels. The trot then becomes important in Inter II and GP, with the introduction of passage and piaffe supported by the trained paces. Interestingly, rider experience also appeared to affect how much training consisted of trot or canter work. The higher the rider grade the less trot and more canter work used, with the exception of RG1, regardless of the horse’s competition level.

It appeared the overall pattern of a training session was 30–39% in transitions, 30–59% on movements specific to the competition level and the remaining time in particular paces. Within the paces, non-elite horses tended to spend the majority in working (20–59%), very little collected (0–19%) and a small amount in extended paces (0–9%). The elite horses spent only marginally more time in working (20–29%) than in collected (10–29%) paces and very little time in extended paces (0–9%). Between the elite and non-elite, the main difference was in the working and collected proportion of work, while they had the same level of extension training.

Typically, horses were cooled down for 11 min over all levels. However, the top three rider groups appeared to spend a longer time than the lower-grouped riders by 2 min.

**Limitations**

As a questionnaire-based study, the analysis carried out on management, and particularly training, is from owners/riders’ perceptions of what they do with their horses rather than measured units. However, a verification pilot trial was carried out by means of 50 monitored training sessions, at which time answers checked against the actual showed a low error rate. The lower number of replies received from the elite groups, particularly Inter II and GP, may have affected the significance levels found by this study, although they are possibly a true representation of the number of those competing at these levels from all registered with BD. This limited accurate evaluation of the difference between the higher levels of dressage.

**Conclusions**

There appears to be a pattern of training horses in the UK that is affected by competition level, which is in agreement with respected texts such as the German manual of advanced dressage training. The current study provides a good baseline of what is happening currently on which to base future recommendations for improvement.

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