Roles of National Swimming Federations in Health Promotion: An International Comparison- Developed vs Developing Countries

Clarence Pérez-Díaz¹, Juan Carlos De la Cruz-Márquez¹, Nuria Rico-Castro², Belén Cueto-Martín¹


Summary

Purposes: To determine the profile of the medical personnel, the priorities and the activities/researches of the National Swimming Federations of Developing and Developed countries with respect to the athletes' health protection and the promotion of health in the general population.

Method: A descriptive transversal study through a confidential survey that was circulated to the 208 FINA National Member Federations. A statistical validity and reliability was obtained (Cronbach α coefficient of 0.8642 for n = 15). The NFs were divided based on their economic level, NFs of developed (n= 66) and developing countries (n=142) following the classification of the Organization for Economic Co-operation and Development, (2016). Analysis: A statistic comparison of measures with the test U of Mann-Whitney was executed.

Results: 80 of the NFs from developing countries (56.3%) responded and 55 NFs from developed countries (83.6%). Evident differences were found in Presence of physiotherapists (Developing NFs: 31.2%, Developed NFs: 58.1%; p<0.005) and psychologists (11.2% vs 21.8%; p=0.096). Top priority for both groups was Performance of the elite athletes, however Increasing the numbers of elite athletes was of major importance for the Developing NFs (4.1 vs 3.95, p <0.05). The programs based around drowning prevention are the most prevalent of the programs run by both (58.7% vs 74.5%; p=0.058).

Conclusion: The NFs did not have the necessary personnel to promote the health of their athletes. Top priority for the Developed NFs was to Increase the numbers of elite athletes but they have low levels of Prevention of injuries programs. Coming back after an injury and Medical examination preparation were also low in Developed and in Developing NFs. Prevention of drowning program was the most frequent program/activity for health of general population, for the recreational athlete and “Save Sport” (without sexual abuse) they were questions of low priority for all of them.

Key words: Swimming. Health. Sport Organizations. Developed & Developing Countries.

Rol de las Federaciones Nacionales de Natación en la promoción de la salud: Comparación países desarrollados vs en vía de desarrollo

Resumen

Objetivos: Determinar el tipo de personal médico, las prioridades y actividades para la protección y promoción de la salud de las Federaciones Nacionales de Natación (FNN) según su nivel económico y determinar si aplicaban los programas relacionados con la salud de la Federación Internacional de Natación (FINA).

Método: Se realizó un estudio descriptivo transversal mediante una encuesta confidencial distribuida a las 208 FNN adscritas a la FINA. La encuesta fue validada y se obtuvo su fiabilidad estadística (coeficiente α de Cronbach de 0.8642 para n = 15). Las FNN se dividieron según su nivel económico, FNN de países desarrollados (n=66) y FNN de países en desarrollo (n=142) siguiendo la clasificación de la Organization for Economic Co-operation and Development, (2016). Análisis: Se realizó una comparación estadística de las medias mediante la prueba U de Mann-Whitney.

Resultados: Respondieron 80 FNN en desarrollo (56.3%) y 55 FNN desarrolladas (83.6%). Hubo diferencias en la presencia de fisioterapeutas (FNN en desarrollo: 31.2%, FNN desarrolladas: 58.1%; p<0.005) y psicólogos (11.2% vs 21.8%; p=0.096). La máxima prioridad para ambos grupos fue la Performance de los atletas de élite, pero aumentar el número de atletas de élite era de mayor importancia para las FNN en desarrollo (4.1 vs 3.95, p <0.05). Los programas de Prevención de ahogamiento fueron los más frecuentes en ambos grupos, pero con diferencias significativas entre ellos (FNN En desarrollo: 58.7% vs FNN Desarrolladas: 74.5%; p=0.058).

Conclusiones: Las FNN no disponían del personal necesario para promover la salud de sus nadadores. La mayor prioridad de las FNN en desarrollo era Aumentar el número de atletas de élite, pero tenían bajos niveles de Prevención de lesiones. Voluntad a competir tras una lesión y Exámenes médicos preparticipación, aunque en las FNN desarrolladas también eran bajos. La Prevención de ahogamiento fueron los programas más frecuentes pero la Salud de la población en general, la del atleta recreativo y el “Deporte Seguro” (sin acoso sexual) eran cuestiones de baja prioridad para todas.


Correspondence: Clarence Pérez Diaz
E-mail: c.perezdiaz@live.com
Introduction

The International Swimming Federation (FINA), in association with UNESCO, UNICEF, the UN, and the IOC, among others, has created the "Swimming for all" programmes, whose key objectives are to reduce the global drowning rates and to promote a healthier lifestyle throughout the world. These programmes are indicators of how sport is becoming a means to promote health.

In developed countries, programmes such as USA Swimming ("splash at a time") and Australia Swimming ("Go swim") have been implemented to promote the health of the population through swimming and can be considered to be models to be followed by other National Swimming Federations (NSF). However, swimming is not accessible in the same way in all the NSF, given that each federation faces different barriers and challenges depending on its geographical location and socio-economic situation.

The IOC is also showing its interest in the protection of the health of its athletes, in developed and developing countries alike. Since the FINA 2009 World Aquatics Championships, studies have been made in relation to injuries and diseases, but there is still room for improvement in the prevention of pathologies and injuries, specifically out of competition.

On the other hand, the levels of participation in international swimming events has increased significantly over the last 20 years. While only 46 NSF took part in the first edition of the FINA World Swimming Championships (25 m) in 1993, 168 NSF were present at the 12th edition of the FINA World Swimming Championships (25 m) in 2014. However, participation in major swimming events may not always be related to the economic status of the NSF. The FINA, through its "Universality Rule", allows athletes from developing countries to take part in the World Championships even with no standard entry times, thereby giving them the opportunity to take part in major events. However, some of these athletes are attending these competitions despite the fact that their national team has limited access to injury prevention programmes and has no support from a medical staff structure, given that in all the NSF have the same health promotion and injury prevention programmes, before and after major events. Those NSF with fewer resources may not have the same capacity to implement health promotion programmes.

The study objectives were: To determine whether the economic level of the NSF is related to the promotion of the health of the general public, whether the economic level influences the application of the health-related rules, projects and programmes of the NSF, and whether the NSF in developing countries attending international swimming events have an adequate medical structure.

Material and method

A universal descriptive study was made of all the NSF recognised by the FINA on 31/12/2014 through an on-line survey. The survey used was based on that published by the International Federation of Sports Medicine (FIMS) for the Sports Federations3 and on that by Mountjoy and Junge for the International Swimming Federations taking part in the 2014 Olympic Games and the 2016 World Championships.

Participants: The questionnaire was sent to the chairpersons, managers, general directors or head of the Medical Committee, where applicable, of the 208 NSF that are members of FINA. The survey respondents were informed that their responses would form the basis of the study and their consent was requested to use these responses in the dissemination of the results in scientific journals.

The identification of the developing countries (NSF in developing countries) and developed countries (NSF in developed countries) was based on the Official Statistics of the Organisation for Cooperation and Development.

The survey was adapted to the specific objectives of this study and, for this purpose, a pilot study was conducted by two independent experts in the area of Sports Science from the University of Granada (Spain) through a blind review. This gave a validity and statistical reliability (Cronbach coefficient α of 0.8642 for n=27).

The survey comprised 11 items relating to the health of athletes, the promotion of health and on the implementation of the programmes proposed by the FINA, and respondent were requested to indicate whether or not their NSF had a Medical Committee, a medical representative on the Executive Board of the Federation, administrative personnel in the medical area and whether the national team was supported by a head doctor, physiotherapist, psychologist, dietician, physical trainer and other personnel to support the medical area.

All the questions were closed. For those related to the athletes’ health, and for those related to health promotion and the implementation of the programmes proposed by the FINA, the items were measured on a Likert type scale from 1-5. A statistical comparison was made of the medians through the Mann-Whitney U test.

For the question on the medical personnel, the possible responses were dichotomous (yes/no). Statistical hypothesis testing was performed in equal proportions.

The description of the results included the percentages of affirmative responses for the dichotomous variables and the mean and standard deviation for the numerical responses. Unanswered questions were excluded from the analysis.

The survey was distributed online using the free software platform LimeSurvey (GNU/GPL v2) and was available at the Computer and Network Services Centre (University of Granada) from 01/10/2014 to 28/02/2015, guaranteeing the anonymity of respondents and observing the applicable EU data protection regulations. The data were imported from the UGR server, unprocessed and independently. The study was made known in person at the FINA World Swimming Championships (25m) (Doha, 29 November to 1 December 2014).

The survey was available in English, Spanish, French and Russian.

Results

The overall response rate was 64.9% (135 of the 208 NSF). The highest rate was from the NSF in developed countries (83.3% vs 56.3%). The NSF that responded to the survey represented 67,276 clubs and almost 1.4 million swimmers, of which more than 90% were from NSF in developed countries (Table 1).

Medical personnel: 27.2% of the NSF in developed countries and 37.5% of the NSF in developing countries had no medical personnel.
58.1% of the NSF in developed countries had a physiotherapist compared to 31.2% of the NSF in developing countries \( (p<0.005) \). 21.8% of the NSF in developed countries had a psychologist in relation to 11.2% of the NSF in developing countries \( (p<0.1) \). Only one in every five NSF had a Medical Committee (Table 2: Figure 1).

Programmes: The programmes based on the prevention of drowning (prevention/learning to swim/lifesaving) were the most used by the NSF in developed countries \( (58.7\%) \) and also by the NSF in developing countries \( (74.5\%; p<0.1) \). The NSF in developed and developing countries alike had few injury prevention programmes \( (developed 28.7\% \text{ vs developing 25.4\%}) \), Medical check-ups prior to participating \( (20\% \text{ vs 16.3\%}) \) and Injury surveillance during the championships \( (25\% \text{ vs 27.27\%}) \). 25% of the NSF in developing countries had return to swimming programmes following injury, in comparison to 7.27% of the NSF in developed countries \( (p<0.05) \) (Table 3).

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**Table 1. Itemisation by continent of the NSF (developed / developing countries)**

<table>
<thead>
<tr>
<th>Type of NSF</th>
<th>Total NFs* ( (n) )</th>
<th>Responses NFs† ( (n; % ) )</th>
<th>Clubs†† ( (n) )</th>
<th>Licences§ ( (n) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing</td>
<td>13</td>
<td>11 (84.6)</td>
<td>350</td>
<td>42.000</td>
</tr>
<tr>
<td>Developed</td>
<td>38</td>
<td>28 (73.6)</td>
<td>53.568</td>
<td>704.710</td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
<td>39 (76.4)</td>
<td>53.918</td>
<td>746.710</td>
</tr>
<tr>
<td>Africa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing</td>
<td>49</td>
<td>29 (59.1)</td>
<td>668</td>
<td>16.318</td>
</tr>
<tr>
<td>Developed</td>
<td>3</td>
<td>3 (100)</td>
<td>76</td>
<td>6.321</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>32 (61.5)</td>
<td>744</td>
<td>22.639</td>
</tr>
<tr>
<td>America</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing</td>
<td>33</td>
<td>19 (57.5)</td>
<td>889</td>
<td>20.372</td>
</tr>
<tr>
<td>Developed</td>
<td>12</td>
<td>11 (91.6)</td>
<td>3.718</td>
<td>394.487</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>30 (66.6)</td>
<td>4.607</td>
<td>414.859</td>
</tr>
<tr>
<td>Asia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing</td>
<td>37</td>
<td>17 (45.9)</td>
<td>546</td>
<td>19.700</td>
</tr>
<tr>
<td>Developed</td>
<td>7</td>
<td>7 (100)</td>
<td>6.253</td>
<td>104.775</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>23 (52.2)</td>
<td>6.799</td>
<td>124.475</td>
</tr>
<tr>
<td>Oceania</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing</td>
<td>9</td>
<td>4 (44.4)</td>
<td>18</td>
<td>940</td>
</tr>
<tr>
<td>Developed</td>
<td>7</td>
<td>6 (85.7)</td>
<td>1.190</td>
<td>82.485</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>10 (62.5)</td>
<td>1.208</td>
<td>83.425</td>
</tr>
<tr>
<td>GLOBAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing</td>
<td>142</td>
<td>80 (56.3)</td>
<td>2.471</td>
<td>99.330</td>
</tr>
<tr>
<td>Developed</td>
<td>66</td>
<td>55 (83.3)</td>
<td>64.805</td>
<td>1,292.778</td>
</tr>
<tr>
<td>Total</td>
<td>208</td>
<td>135 (64.9)</td>
<td>67.276</td>
<td>1,392.108</td>
</tr>
</tbody>
</table>

*Total of NSF (n) that are members of the FINA; †NSF that answered (n; %); ††Number of clubs within the participating NSF; §Number of affiliated or licensed swimmers of the participating NSF.

**Table 2. Profile of the medical personnel.**

<table>
<thead>
<tr>
<th>Medical personnel</th>
<th>NSF developed c. ( n=55 ) (%)</th>
<th>NSF in developing c. ( n=80 ) (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiotherapist</td>
<td>58.18</td>
<td>31.25</td>
<td>0.002*</td>
</tr>
<tr>
<td>Doctor</td>
<td>41.82</td>
<td>32.5</td>
<td>0.266</td>
</tr>
<tr>
<td>Sport scientist</td>
<td>32.73</td>
<td>23.75</td>
<td>0.250</td>
</tr>
<tr>
<td>Dietician</td>
<td>27.27</td>
<td>17.5</td>
<td>0.174</td>
</tr>
<tr>
<td>Administrative personnel</td>
<td>23.64</td>
<td>16.25</td>
<td>0.285</td>
</tr>
<tr>
<td>Medical committee</td>
<td>21.82</td>
<td>18.75</td>
<td>0.661</td>
</tr>
<tr>
<td>Psychologist</td>
<td>21.82</td>
<td>11.25</td>
<td>0.096**</td>
</tr>
<tr>
<td>Medical personnel on the Board of Management</td>
<td>12.73</td>
<td>12.5</td>
<td>0.968</td>
</tr>
<tr>
<td>Other</td>
<td>9.09</td>
<td>5.5</td>
<td>0.936</td>
</tr>
</tbody>
</table>

*p<0.005; **p<0.1

**Figure 1. Profile of the medical personnel.**
Table 3. Programmes for the promotion of healthcare, investigation activities or directives.

<table>
<thead>
<tr>
<th>Programme</th>
<th>NSF in developing c. n= 80 (%)</th>
<th>FNN in developed c. n= 55 (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention of drowning, learning to swim, lifeguards</td>
<td>58.75</td>
<td>74.55</td>
<td>0.058*</td>
</tr>
<tr>
<td>First aid (for example on-site doctor)</td>
<td>37.50</td>
<td>30.91</td>
<td>0.430</td>
</tr>
<tr>
<td>Inclusion of senior citizens</td>
<td>33.75</td>
<td>21.82</td>
<td>0.133</td>
</tr>
<tr>
<td>Injury prevention with programmes based on swimming</td>
<td>28.75</td>
<td>25.45</td>
<td>0.673</td>
</tr>
<tr>
<td>Control of injuries during championships</td>
<td>25.00</td>
<td>27.27</td>
<td>0.767</td>
</tr>
<tr>
<td>Return to training after injury</td>
<td>25.00</td>
<td>07.27</td>
<td>0.008**</td>
</tr>
<tr>
<td>Pre-participation medical screening</td>
<td>20.00</td>
<td>16.36</td>
<td>0.593</td>
</tr>
<tr>
<td>Obesity and excess weight</td>
<td>18.75</td>
<td>20.00</td>
<td>0.856</td>
</tr>
<tr>
<td>Ambassador swimmers promoting health</td>
<td>16.25</td>
<td>12.73</td>
<td>0.566</td>
</tr>
<tr>
<td>Prevention of chronic diseases in the population</td>
<td>12.50</td>
<td>09.09</td>
<td>0.536</td>
</tr>
</tbody>
</table>

*p<0.1; **p<0.05

Priorities: No significant differences were appreciated, except in relation to the increase in the number of elite athletes (p<0.05). The maximum priority for the NSF in developing countries and those in developed countries (4.07/5) was the maximum performance of the elite athlete. Both groups of NSF classified the athlete’s health as the 3rd priority. The fight against doping was considered to be the 4th priority for the NSF in developing countries (3.99/5) and the 2nd for the NSF in developed countries (Table 4, Figure 2).

Discussion

Through this study, for the first time a comparison has been made of the healthcare resources of the NSF throughout the world according to their economic level, helping to present a picture of the health problems affecting the NSF. Earlier studies did not consider the economic level of the NSF, but limited their focus to those NSF with a high sporting level. These surveys were supplied on the spot at the world swimming championships and were answered by the personnel attending the event[16]. By

Table 4. Classification of the health topics considered by the NSF. Likert Scale (0-5).

<table>
<thead>
<tr>
<th>Temas de salud</th>
<th>NSF in developing c.</th>
<th>NSF in developed c.</th>
<th>Contrast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \bar{X} )</td>
<td>SD</td>
<td>( \bar{X} )</td>
</tr>
<tr>
<td>Maximum performance of elite athletes</td>
<td>4.18</td>
<td>1.21</td>
<td>4.07</td>
</tr>
<tr>
<td>Increase in the number of elite athletes</td>
<td>4.10</td>
<td>1.25</td>
<td>3.72</td>
</tr>
<tr>
<td>Health of their elite athletes</td>
<td>4.09</td>
<td>1.21</td>
<td>3.96</td>
</tr>
<tr>
<td>Fight against doping</td>
<td>3.99</td>
<td>1.24</td>
<td>3.98</td>
</tr>
<tr>
<td>Increase in the number of officials and trainers</td>
<td>3.89</td>
<td>1.21</td>
<td>3.61</td>
</tr>
<tr>
<td>Picture of safe sport, with no abuse or sexual harassment</td>
<td>3.80</td>
<td>1.19</td>
<td>3.78</td>
</tr>
<tr>
<td>Picture of pleasant physical activity</td>
<td>3.51</td>
<td>1.25</td>
<td>3.63</td>
</tr>
<tr>
<td>Increase in the number of spectators and fans</td>
<td>3.44</td>
<td>1.23</td>
<td>3.33</td>
</tr>
<tr>
<td>Increase in the number of recreational athletes</td>
<td>3.28</td>
<td>1.19</td>
<td>3.41</td>
</tr>
<tr>
<td>Health promotion in the general population</td>
<td>3.23</td>
<td>1.25</td>
<td>3.17</td>
</tr>
<tr>
<td>Health promotion of recreational athletes</td>
<td>3.13</td>
<td>1.33</td>
<td>3.22</td>
</tr>
</tbody>
</table>
contrast, our study was distributed among all the NSF, being addressed
to the heads of the NSF and giving ample time for their response. The
questions did not refer to numbers of personnel, just to the presence
or absence of the same, so as not to upset those NSF who did not have
personnel in the categories studied.

Studies have been conducted on the prevention of injuries in
developing countries in other sports, predominantly football19, but no
study had yet been made for swimming. In the case of African football,
it was concluded that injury prevention required a pragmatic approach,
knowledge of, and adaptation to the resources available18 and, although
care should be taken when applying the results of one sport to another,
it was considered that these contributions could be useful in swimming.

In our study, the profile of healthcare-related personnel showed no
significant differences between the two economic levels, except with
regard to physiotherapists and psychologists, and always with values
of less than 50% (except for doctors of the NSF in developed countries
where the value reached 58%), despite the fact that a recommendation
has been made to integrate a range of personnel in the sports medicine
team19. Our results indicated that a large number of NSF did not have
the necessary personnel to promote the physical and mental health of
their swimmers and that they had not applied the recommendations
to diagnose, treat and rehabilitate, even when sufficient financial re-
sources were available20,21. Neither did the economic level appear to be
significant with regard to having or not having a Medical Committee
within the organisation chart of each NSF, in order to emphasise the
importance of sports medicine for athletes and to demonstrate the
readiness of the NSF to progress in this field6.

Despite the economic divides between the NSF, no significant
differences were found in their priorities, with the exception of increa-
sing the number of elite athletes, which was more marked for the NSF
in developing countries. For both categories, the top priority was to
Guarantee the best performance of the elite athlete, while the Health
of the athletes was the third priority. The fact that the NSF in developing
countries gave great importance to Guaranteeing the best performance
of the athlete, while attending events without adequate medical sup-
port, indicated that they do not have the resources to allow them to
offer the desired medical support to their athletes and many of these
athletes could only be assisted by medical personnel forming part of
the Championship staff.

For the NSF in developed countries, the Fight against doping was
the second priority. Although the classification of this topic was the
4th priority for the NSF in developing countries, both groups gave
almost identical levels of importance to this matter. This finding was
to be expected given that all the governing bodies of the swimming
organisations (FINA and the Continental Federations) are required, in
accordance with the Code of the World Anti-Doping Agency (WADA)
to adopt anti-doping measures during their national events and out of
competition22. Compliance with the WADA code is also a precondition
for taking part in the Olympic programme. Despite this, it was a matter
of concern that the remaining 55% of the NSF did not consider doping
to be a problem of top priority.

The NSF in developing countries had low levels for Injury Prevention
and for return to competition following injury and very low levels in
relation to the pre-participation medical Screening, however the NSF in
developed countries also had low levels and, in some cases, these were
even lower. Returning to swim following an injury was more prevalent
in the NSF in developing countries (25%) than for those in developed
countries (7.2%) (p<0.005). Despite the fact that physiotherapists play
a key role in injury recovery23, they were under-represented in the NSF
in developing countries in relation to those in developed countries
(p<0.005).

The FINA Medical Rules emphasise the protection and promotion of
the athlete’s health during training and competition and the FINA
conducts a comprehensive surveillance of injuries at its events24,25. How-
ever, it was observed that many of the NSF were unaware of this policy,
given that only 25% of the NSF in developing countries and 27.27% of
those in developed countries stated that they were implementing these
programmes in their own championships.

Recreational sport can be used as an activity to promote good
health and also to contribute to health-related quality of life26. However,
up to now, the NSF have not been focussing on the Protection of the
health of recreational athletes. Both NSF groups considered this pro-
blem to be either the last or penultimate priority. We believe that the
lack of policies to promote the health of recreational athletes is a lost
opportunity for the NSF given that there is a need to create policies to
support and motivate the SF in general in order to address the health
and wellbeing of non-elite athletes27.

One of these opportunities could be in the anti-doping area; this is
no longer limited to professional athletes but is increasingly becoming
a problem among recreational athletes28. However, the NSF considered
that they had more important matters than addressing the protection
of the health of recreational athletes.

Governments and private institutions such as the NSF are respon-
sible for establishing sexual abuse prevention policies to promote “Safe
Sport” in which the team doctors must play an important role in the pre-
vention and early detection of sexual harassment and abuse in sport29,
particularly in the “stage of imminent achievement”, which is the period
of maximum vulnerability of young athletes to sexual abuse23. It is vital
to know that prevention and the successful eradication of abuse and
harassment of athletes is based on the effectiveness of the leadership
of the principal international and national sports organisation such as
the NSF, in our case28. However, the NSF in developing and developed
countries alike classified “Safe Sport” as a topic of medium priority. Only
some NSF in developed countries were aware of the problem and had
adopted real measures. For example, Swim Ireland29, USA Swimming30
and Scottish Swimming31, have implemented harassment-free sports
policies. Swimming South Africa also initiated its own child protection
policy, including legislative initiatives and guidelines on this matter by
the South African government32. Existing legislation and the guidelines
established in the NSF in developed countries could serve to encourage
other NSF to introduce the corresponding sexual harassment and child
protection policies.

Exercise in water can benefit senior citizens, by improving their qua-
lity of life and reducing disability33, improving or maintaining the bone
health of post-menopausal women34, reducing the risk of chronic and
cardiac diseases and improving the health of persons with diabetes35.
However, both categories of NSF considered that the health of the ge-
neral public was a matter of low priority (penultimate and last priority

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respectively). This indicates that the NSF were more concerned with the wellbeing of their elite athletes than with that of the general public. Moreover, the NSF are possibly losing the opportunity to increase the general popularity of their sport in population groups, such as senior citizens. Although global ageing is increasing, the NSF of both groups showed low levels of concern for the promotion of the health of senior citizens, given that only 33.7% of the NSF in developing countries and 21.8% of those in developed countries, had programmes directed at senior citizens. The European Swimming League (LEN) has shown its interest in taking part in activities to promote the health of senior citizens and increasing the participation in the over-sixties category, organising a series of Pool Open Days throughout Europe. This top-down approach could encourage more NSF to implement similar programmes of their own.

The low levels of programmes based on the prevention of chronic diseases in the general public indicate that neither the NSF in developing countries (12.5%) nor those in developed countries (9.0%) considered this problem to be their responsibility, although the NSF could have a role to play, considering the high mortality rates due to chronic diseases throughout the world and the proven health benefits of swimming.

An area in which the NSF were particularly active was that relating to the prevention of drowning/learning to swim/life saving. These programmes were by far the most popular programmes among the NSF in developing countries (58.7%) and those in developed countries (74.5%) (p<0.1), being beneficial to recreational athletes and to the general public. Although no bibliographic reference has been found to orientate this point of the discussion, the Drowning prevention programmes may represent sources of income for the federations and for athletes, explaining why the presence of these programmes was significantly higher in the NSF than the other programmes assessed. Unquestionably these programmes could help attract swimmers and provide a social service to prevent death from drowning.

In future studies it would be interesting to obtain information on the available resources and the expenditure criteria in the health area for both NSF groups.

Conclusions

Despite the great economic differences between the NSF, there was hardly any difference in healthcare-related personnel, and a large number of federations did not have the personnel required to promote the physical and mental health of their swimmers.

No significant differences were found in their priorities, with the exception of increasing the number of elite athletes, which was more relevant for the NSF in developing countries.

The NSF in developing countries had low levels for Injury Prevention and for return to competition following injury in relation to the pre-participation medical Screening, however the NSF in developed countries were also low and, in some cases, were even lower.

For both NSF categories, the drowning prevention programmes were the most frequent healthcare programmes, however the Health of the general public, that of Recreational Athletes and "Sport without harassment" were matters of low priority.

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Conflict of interest

The authors have no conflict of interest whatsoever.

Bibliography