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10 years of the JMCFD



JMCFD

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The mission of the Journal of the Malta College of Family Doctors (JMCFD) is to deliver accurate, relevant and inspiring research, continued medical education and debate in family medicine with the aim of encouraging improved patient care through academic development of the discipline. As the main official publication of the Malta College of Family Doctors, the JMCFD strives to achieve its role to disseminate information on the objectives and activities of the College.

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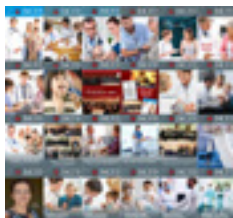
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The first ten years of the Journal of the Malta College of Family Doctors 2012-2022 - a review

Dr Mario R SAMMUT

ABSTRACT

Background

Since 1990 the Malta College of Family Doctors (MCFD) has regularly published a journal under different names: *'It-Tabib tal-Familja'* (1990-2000), *'The Family Physician - It-Tabib tal-Familja'* (2000-2004), *'Maltese Family Doctor'* (2005-2010) and the *'Journal of the Malta College of Family Doctors (JMCFD)'* (since 2012).

Objective

This review of the issues published of the JMCFD during 2012-2022 was undertaken to study not only the dates and numbers of issues but also issue themes, article types and topics and author specialities/grades.

Method

Information regarding all JMCFD issues published between 2012 and 2022 was gathered and inserted into a Microsoft Excel spreadsheet to enable scrutiny of the content by quantitative and qualitative analysis.

Results

One hundred and thirty-eight articles were published in the twenty-four issues of the JMCFD that came out during 2012-22. While the themes of all issues were related to family medicine, several of them also focused on certain topics, with one third tackling education. Research articles made up 29% of all articles, while family medicine was the most popular topic (46%). Most of the 235 authors were males (62%) and family doctors (54%).

Conclusion

The JMCFD prioritises publication of submitted / peer-reviewed articles to focus on quality over quantity, while maintaining its focus on family medicine in general and education in particular. Besides serving as a source of information useful for family doctors in their practices, the journal provides the opportunity to family doctors, other specialists and trainee doctors to submit their research for consideration towards publication in a peer-reviewed family medicine journal.

Key Words

Review, publications, family practice, education, Malta

INTRODUCTION

Background

The Malta College of Family Doctors (MCFD) has published a journal regularly since 1990, the year it was formally set up (see Table 1). The first issue of '*It-Tabib tal-Familja*' came out in September 1990 as a four-page newsletter, with Dr Godfrey Farrugia as editor. In 1993 Dr Jean Karl Soler replaced Dr Farrugia as editor and two years later the newsletter was converted to a colour journal. Then in 2000 the journal was renamed '*The Family Physician - It-Tabib tal-Familja*' as part of an academic upgrade to recruit papers from the Mediterranean region that also involved the appointment of three international peer reviewers and an international scientific advisory board. Dr Noel Caruana was appointed editor in 2005, with the journal undergoing another change in name to the '*Maltese Family Doctor*'. (Sammut, 2015)

The journal was relaunched in 2012 with the name '*Journal of the Malta College of Family Doctors*' (JMCFD) and Prof. Pierre Mallia as editor. In 2021 Dr Mario R Sammut and Dr Anton Bugeja took over as joint editors of the JMCFD, with the latter relinquishing his post in 2022 to leave Dr Sammut as sole editor. Over the 33 years since 1990, fifty-nine issues of the MCFD's journal (in its various formats) have been published (see Table 1).

Objective

On the tenth anniversary of the launch of the JMCFD, this review was undertaken to analyse the issues of the JMCFD that were published during 2012-2022. The study examined not only dates and numbers of issues but also issue themes, article types and topics, and author specialities/grades.

METHOD

The following information regarding all JMCFD issues published between 2012 and 2022 was gathered and inserted into a spreadsheet using the computer software programme Microsoft Excel to enable scrutiny of the content by quantitative and qualitative analysis:

- year and month of issue;
- volume and issue numbers;
- theme of issue;
- article type, topic and name;
- author names, gender and speciality/grade.

As no sensitive personal data were gathered, ethics committee approval was not required for this study.

RESULTS

Table 2 shows the year and month, volume and issue numbers, theme and numbers of articles for each issue of the JMCFD published during 2012-2022.

Table 1: Details of all MCFD journals published during 1990-2023

NAME	YEARS	EDITOR/S	VOLUME NO.	ISSUES
It-Tabib tal-Familja	1990 - 1991	Godfrey Farrugia		3
	1993 - 2000	Jean Karl Soler		15
The Family Physician - It-Tabib tal-Familja	2000 - 2004	Jean Karl Soler		7
Maltese Family Doctor	2005 - 2010	Noel Caruana	14 - 19	9
	2012 - 2020	Pierre Mallia	1 - 9	22
Journal of the Malta College of Family Doctors	2021 - 2022	Mario R Sammut & Anton Bugeja	10 - 11	2
	2023 -	Mario R Sammut	12	1
			TOTAL	59

Table 2: Year, month, volume, issue, theme and article numbers of each issue of the JMCFD during 2012-2022

YEAR	MONTH	VOLUME	ISSUE	THEME	ARTICLES
2012	August	1	1	None	7
	November	1	2	Education in Family Medicine. What has been achieved?	11
2013	April	2	1	Family medicine: present & future	7
	August	2	2	Ethics: Current issues	9
	December	2	3	Education & Geriatrics	6
2014	May	3	1	Child health	5
	September	3	2	Mental health	7
	December	3	3	Training & Assessment	6
2015	May	4	1	Paediatrics	6
	September	4	2	25 years of the MCFD	5
	December	4	3	FMCFD and MMCFD graduation 2015	4
2016	April	5	1	The diversity of family medicine	4
	August	5	2	Family Medicine: from the cradle to the grave	7
	December	5	3	MMCFD and Teachers' Course Graduation 22 November 2016	6
2017	April	6	1	Primary Care Management of patients, conditions, colleagues and services	6
	August	6	2	Sports and exercise medicine	7
	December	6	3	MCFD Graduation 28 November 2017	5
2018	June	7	1	Dr Tania van Avendonk 1964 - 2018	4
	December	7	2	Primary health care	4
2019	June	8	1	Family Medicine and the Specialist Register	4
	December	8	2	Family Medicine Training and Practice	4
2020	December	9	1	Ensuring Quality of Family Practice and Training	4
2021	December	10	1	A new normal for family doctors	4
2022	December	11	1	Primary - Secondary Interdisciplinary Case	6
TOTAL					138

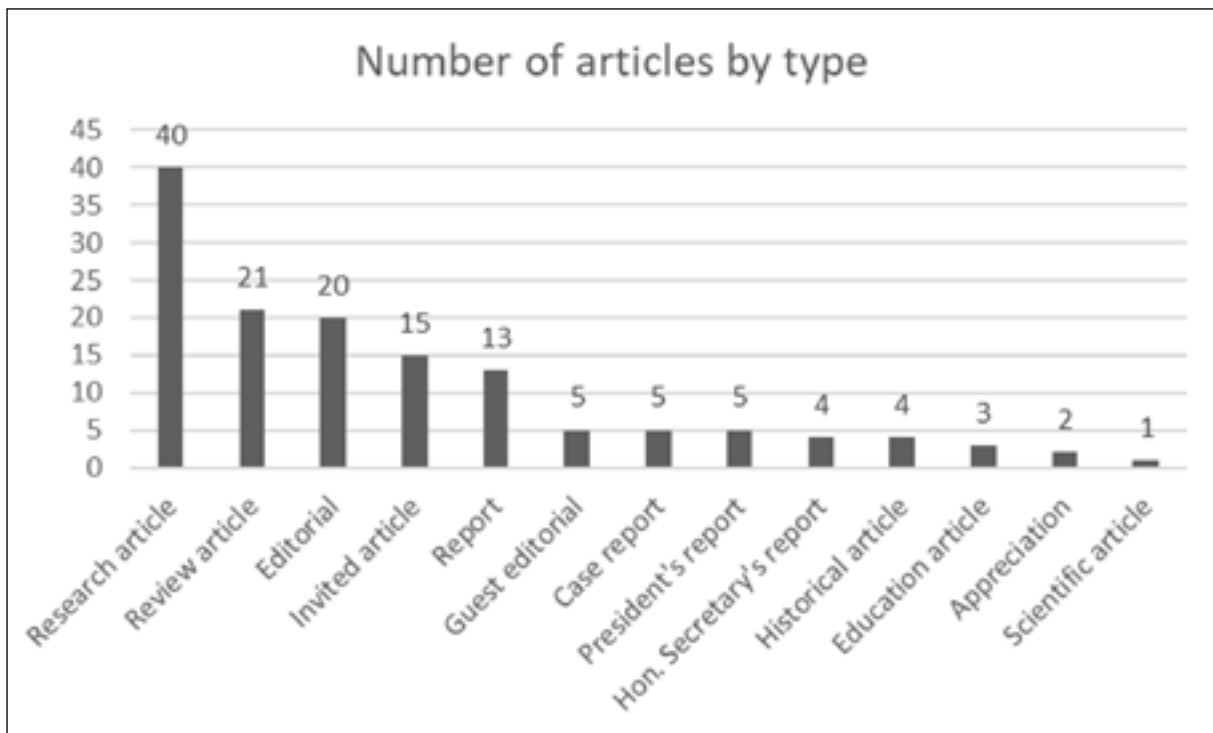


Figure 1: Number of articles by type published in the JMCFD during 2012-22

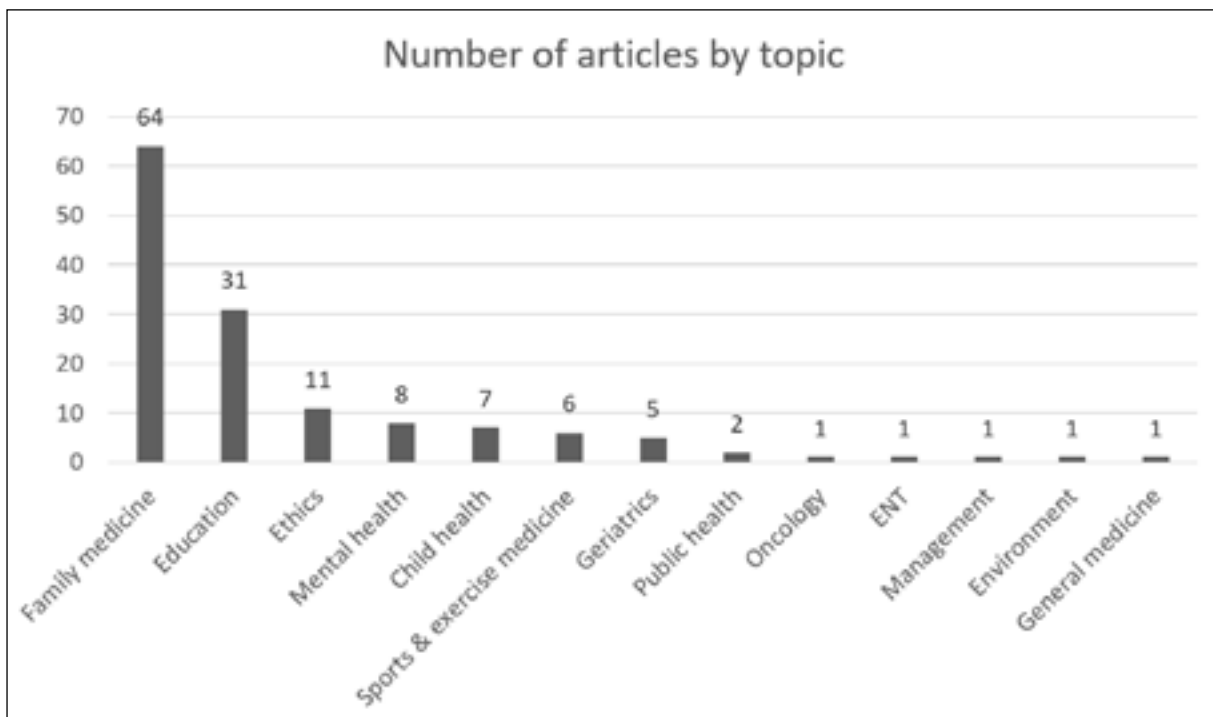


Figure 2: Number of articles by topic published in the JMCFD during 2012-22

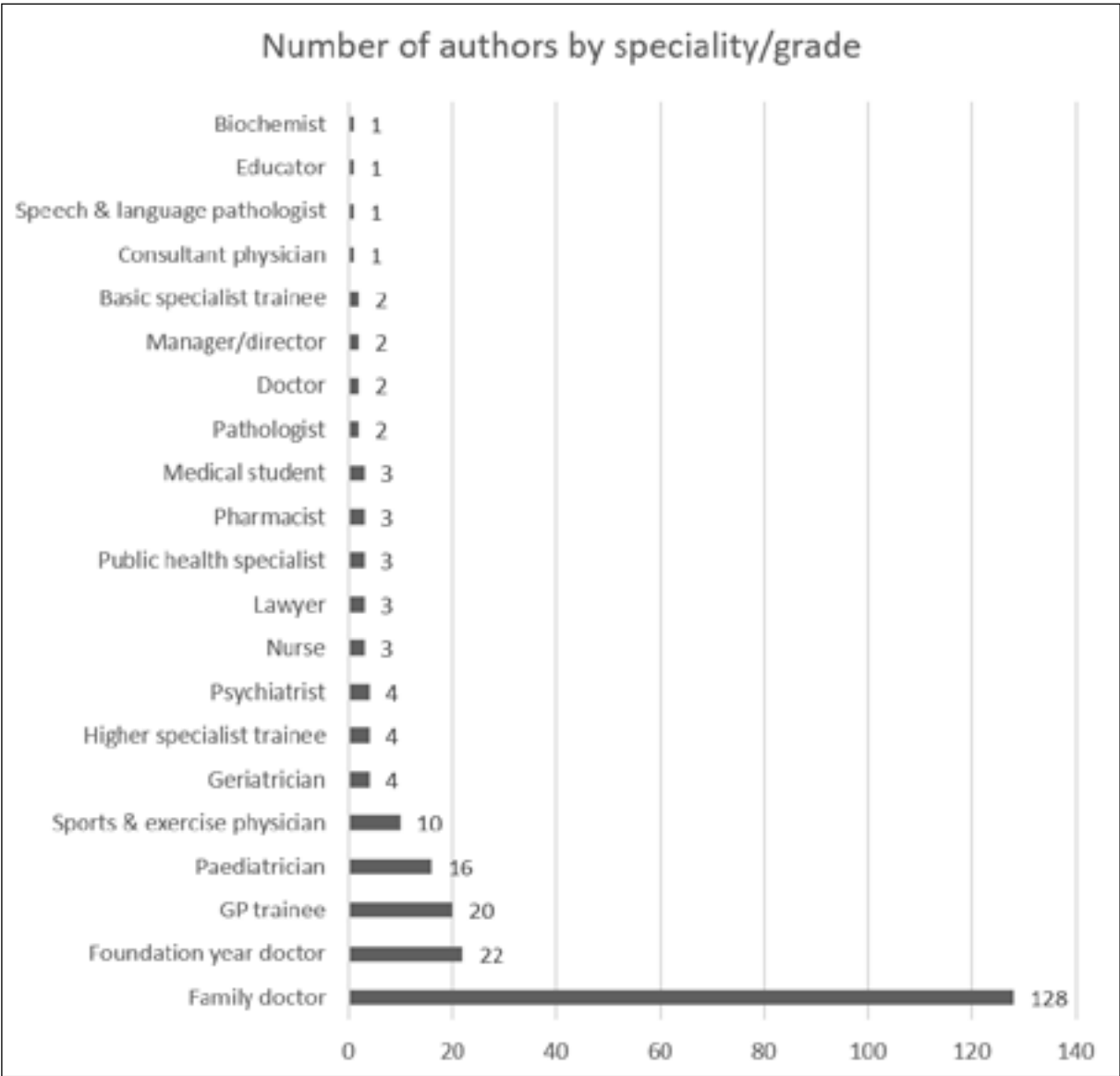


Figure 3: Number of authors by specialty/grade of articles published in the JMCFD during 2012-22

One hundred and thirty-eight articles (see Table 2) were published in the 24 issues of the JMCFD that came out during 2012-2022 (see Table 1), i.e. an average of 5.75 articles per issue.

While the themes of all issues were related to family medicine (see Table 2 for details), a number of them also focused on the following topics:

- Education (8 issues);
- Child health / paediatrics (2 issues);
- Ethics, geriatrics, mental health and sport & exercise medicine (1 issue each).

Of note were two special issues, one celebrating 25 years of the MCFD in 2015 and another commemorating the life of MCFD former Council Member Dr Tania van Avendonk 1964 – 2018.

Figure 1 displays the number of articles by type. Excluding editorials and guest editorials (25 in total), the top four consisted of research articles (n=40 or 29% of all articles), review articles (21 or 15%), invited articles (15 or 11%) and reports (13 or 9%). The classification of articles by topic may be seen in Figure 2, with family medicine being the most popular (n=64 or 46% of all articles) followed by education (31 or 22%).

No less than 235 different authors (147 males or 62% and 89 females or 38%) contributed to the 138 articles published during 2012-2022 (see Figure 3). Most authors were family doctors (n=128 or 54% of all authors), with the next highest being foundation year doctors (22 or 9%) and GP trainees (20 or 8%), followed by paediatricians (16 or 7%) and sport & exercise physicians (10 or 4%).

DISCUSSION

During the first six years (2012-2017) of the JMCFD, the journal was published three times a year, then twice a year during 2018-2019, following which (2020-2023) it was published once yearly. While the invitation of recognised

experts to author commentaries is known to be practiced by peer-reviewed medical journals (Thomas et al, 2019), the current editorial board had agreed to avoid where possible the inclusion of invited articles / reports in order to comply strictly with the ethos of the JMCFD as a peer-reviewed journal. This focus on quality over quantity by limiting publication to submitted / peer-reviewed articles has resulted in a drop of the JMCFD's frequency of publication from three times to once a year.

The practice of publishing theme issues is common among international journals (Jones and Moss, 2010; Mondello and Pedersen, 2003; Zawacki-Richter and Naidu, 2016). Of the twenty-four issues included in this review, eight issues (33%) focused on education, in line with the JMCFD's mission of encouraging improved patient care through academic development of the discipline of family medicine (Journal of the Malta College of Family Doctors, 2012). Another six (25%) were theme issues dedicated to specialities closely related to family medicine, specifically child health / paediatrics (two issues) and ethics, geriatrics, mental health and sport & exercise medicine (one issue each) (Bugeja, 2022).

Research and review articles and case reports together formed the majority (n=66 or 48%) of the 138 articles published in the JMCFD during 2012-2022, with invited articles and reports (n=28) making up another 20%. As explained in the editorial of the first issue of the JMCFD, the journal was relaunched to attract studies in general practice and thus serve as a source of information useful for family doctors in their practices (Mallia, 2012). In fact, 64 or 46% of the article topics were directly related to family medicine, while the other topics were also of interest to the family doctor in view of the latter's wide role in managing undifferentiated illness, dealing with all health problems and interacting with other specialities (World Organisation of Family Doctors – Europe, 2023).

As might be expected, the majority of authors were family doctors (54%), immediately followed by foundation year doctors (9%). While the latter finding may seem unusual, it is known that these young doctors in training are keen to further their careers and publication is known to be a key contributor to such advancement in health professions (McGaghie, 2009). It is encouraging to note that GP trainees formed the next highest group of authors (8%), in line with the importance given to research by the Specialist Training Programme in Family Medicine (Zammit, Sammut and Abela, 2017).

Study strength, limitation and implication for the future

While the fact that this content analysis of the JMCFD was carried out for the first time was a strength of this review, one limitation was that the review was limited to the 24 issues of the JMCFD published during 2012-2022 and excluded the 34 journal issues printed previously by the MCFD during 1990-2020. Such research comparing the content of issues of all four journals published by the MCFD would clarify further the path that the College journal has taken since its foundation in 1990 and benefit its future direction.

CONCLUSION

This study has successfully analysed the contents of the 24 issues of the JMCFD published during 2012-22. The journal has in recent years limited publication to submitted / peer-reviewed articles to focus on quality over quantity, while maintaining its focus on family medicine in general and education in particular. Besides serving as a source of information useful for family doctors in their practices, the journal provides the opportunity to family doctors, doctors in training and other related specialists to submit their research studies for consideration towards publication in a peer-reviewed family medicine journal.

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A quantitative analysis of patients' use of government health centres in Malta during 2020-2022

Dr Daniela MIFSUD, Dr Jurgen C ABELA, Mr Gianluca URSINO and Ms Julia ZAHRA

ABSTRACT

Background

At present in Malta, primary health care is delivered via the publicly funded health service - Primary HealthCare - and a parallel running private health system. The Electronic Patient Record (EPR) started to be utilized in Primary HealthCare in 2020.

Objective

The aim of this cross-sectional observational study was to analyze patients' use of health centres between January 2020 (which coincides with the start of use of EPR) until August 2022.

Method

Data was collected from the Electronic Patient Record which is the database used by Primary HealthCare in Malta which was then analyzed using Excel 2010. Variables collected included patient's age, gender, number of patients visiting the health centre, patient's locality, and whether it was a telephone or face-to-face consultation.

Results

The results clearly demonstrated a rise in patients making use of health centres over the period 2020-2022. Mosta Health Centre was observed to be the busiest health centre. Health centre patients' use in summer was significantly different from use in winter. Furthermore, the

female population seemed to be attending these clinics more than their male counterparts.

Conclusion

Over the years a trend was noted where telephone consultations were not popular in 2020 but as the pandemic went on patients became more aware and made use of telemedicine. The majority of patients using telemedicine were aged 70+. However, as the social distancing measures of COVID-19 were eased in 2022, the majority of patients opted for face-to-face GP consultations once again.

Keywords

Electronic health records; telemedicine; pandemics; COVID-19; primary health care

INTRODUCTION

At present in Malta, primary health care is delivered via the publicly funded health service - Primary HealthCare - and a parallel running private health system. There is no compulsory doctor-patient registration so far. The public sector is provided through ten health centres and a mix of community clinics, whilst the private sector is composed of general practitioners working through community pharmacies or their own clinics. The publicly funded primary health system is free at the point-of-delivery and delivered through nine health centres in Malta

and one health centre in Gozo. The three main health centres are located in Floriana, Mosta and Paola and are open 24 hours a day. The satellite health centres consist of Birkirkara, Rabat, Gżira, Qormi, Kirkop and Cospicua. All health centres in Malta provide a routine general practitioner (GP) service, as well as a comprehensive list of ancillary services (Baldacchino et al., 2017).

The electronic patient records (EPR) enable the storage, retrieval and modification of health data using digital means instead of paper-based recording systems within one healthcare organization (Lo Re, 2021). When properly implemented, the EPR can improve the quality of healthcare, increase guideline compliance and reduce medication errors (Takian, Sheik and Barber, 2012). The EPR was launched in Primary HealthCare in January 2020, just a few weeks prior to the COVID-19 pandemic in the Maltese Islands.

The aim of this cross-sectional observational study was to analyze the use of health centres by patients between January 2020 (which coincides with the start of use of EPR) until August 2022. The hypothesis of this study was that throughout the peaks of the COVID-19 pandemic less people made use of health centres for a medical review with a subsequent rise in patients' use of health centres as restrictions were eased. A second hypothesis of this study was that patients made more use of health centres in winter when compared to summer.

METHOD

Data was collected from the EPR which is the main database used in Primary HealthCare in Malta. It started being rolled out in January 2020, with all health centres making use of it from March 2020 except Victoria Health Centre in Gozo. The Data Protection Officer and Clinical Chairman of Primary HealthCare granted permission to time-limited access to the EPR to collect data. Ethical approval was obtained from the University of Malta Research Ethics Committee, making it a total of 3 approvals obtained prior to commencing the study.

A week in March (7-13) in 2020, 2021, 2022 as well as a week in August (3-9) 2020, 2021, 2022 were chosen for analysis. The idea behind this choice was to choose a week during the winter period and a week during the summer period. Whilst ideally more weeks were chosen throughout data collection to achieve a more representative sample, six data sets were deemed to be feasible for the authors to analyse trends in health centres use. The reason why March was the month used to represent the winter months was because, in the first year of EPR use (i.e. 2020), the earliest data uploaded on the EPR was in March. In addition, given the huge volume of data to be collected and limited human resources, two weeks were deemed to be manageable by the authors. Variables collected included patient age, gender, number of patients visiting the health centre, the patient's locality, and whether it was a telephone or face-to-face consultation. This was done for all nine health centres in Malta.

All patients who visited a health centre during the above-mentioned periods were included. Gozo health centre was excluded from the analysis (due to absence of EPR at the time periods being studied). With regards to the paediatric population, whose age was written in months, the authors opted for the age range 0-1 as there would be difficulty to analyse data based on months as well.

Data was anonymised by removing name, surname and ID numbers prior to it being inputted in Excel 2010. The quantitative data was analysed using Excel 2010. The data was handled only by the four researchers with the files being password protected and stored securely.

RESULTS

It was noted that throughout the two one-week study periods per year during 2020-2022, 25,398 patient encounters were recorded. Of these 52% of patients were female while 48% of patients were male. The commonest subgroup were patients aged 70+ (Figure 1) which was composed of 12.3% females and 10.0% males (Figure 2). Given that the accepted cut-off age between paediatric and adult population is 18 years of age, the second and third age bracket do not adhere to the 10-year interval.

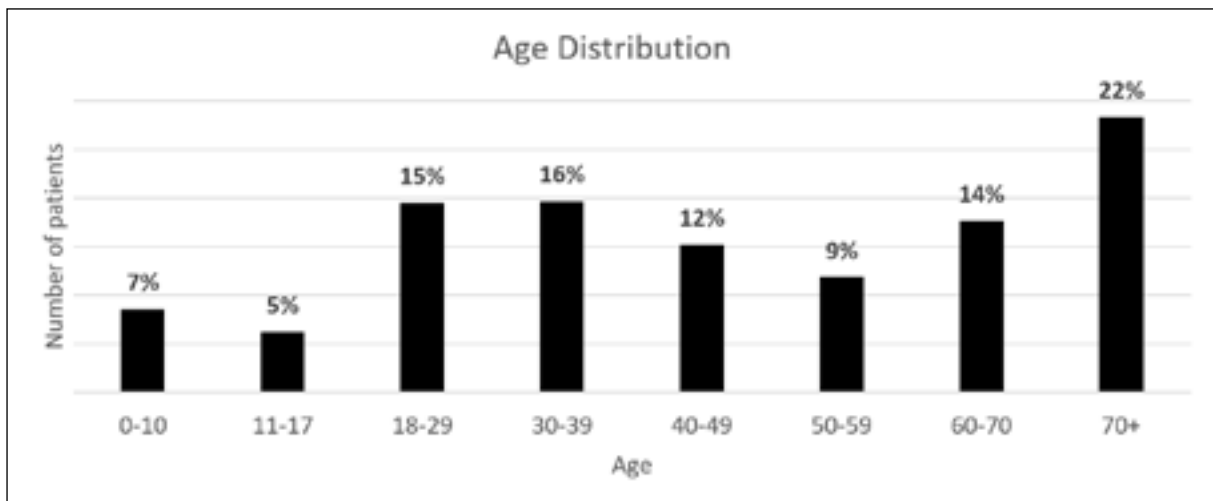


Figure 1: Age distribution (in years)

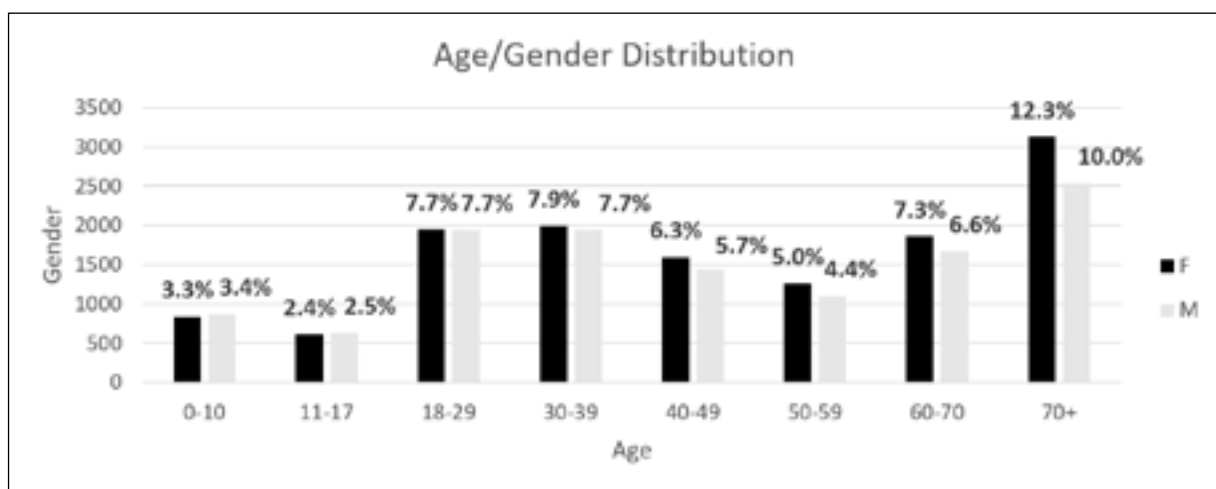


Figure 2: Age/gender distribution (F – female; M- male)

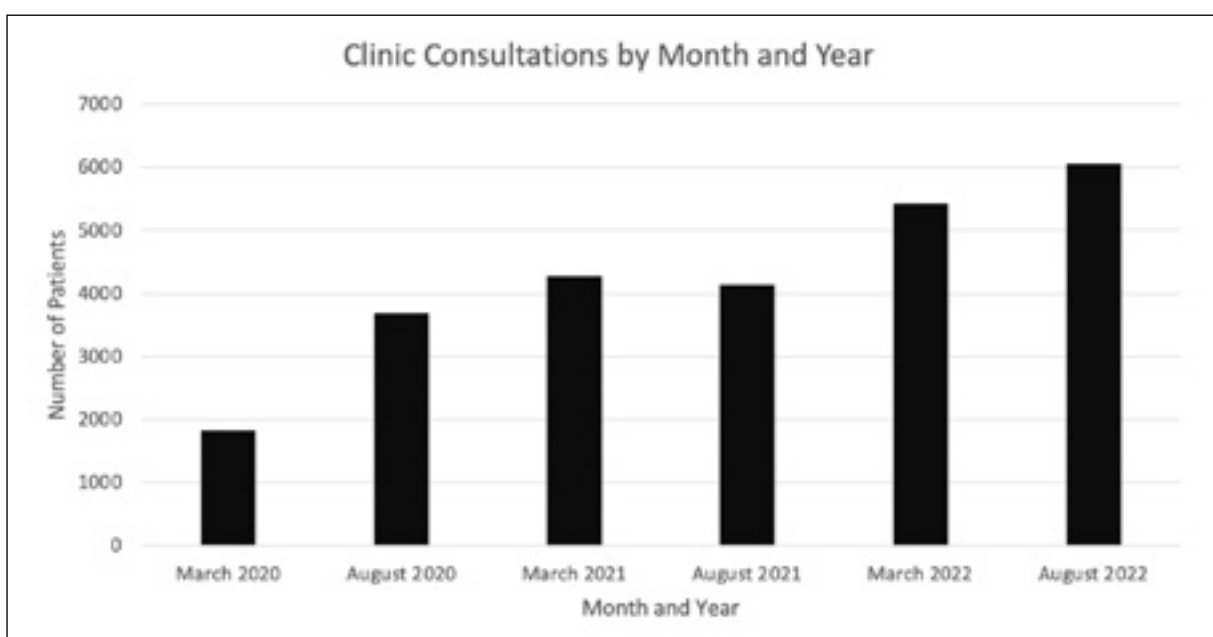


Figure 3: Clinic consultations by month and year

During the time period studied, that is 2020-2022, the face-to-face consultations increased with an all time high in August 2022, as shown in Figure 3.

To determine if the health centre use in summer was significantly different from its use in winter, a one-sided proportion test was used. Out of the 25,398 samples, 13,872 of patients visited a health centre in summer which resulted in a sample proportion of 0.55. Using the *prop.test()* function in *R*, a *p*-value of approximately zero was achieved, hence there is strong evidence that the government health centre use in summer was significantly different from the clinic use in winter.

A simple linear trend model was fitted to the number of health centre use in time, which is defined as

$$y_i = \beta_1 t_i + \beta_0 + \varepsilon_i,$$

where y_i is the number of clinic use, t_i is the time point, β_0 is the intercept, β_1 is the slope and ε_i is the error. This model can be used to determine

if the increase in the trend in health centre usage is statistically significant by estimating the slope parameter and noting if it is significantly different from zero. This is depicted in Table 1.

Table 1: Number of health centre use in time

MONTH	TIME-POINT	COUNT
March 2020	1	1828
August 2020	2	3679
March 2021	3	4272
August 2021	4	4138
March 2022	5	5426
August 2022	6	6055

Using the ordinary least square estimation from the *lm()* function in *R*, the estimates were achieved as seen in Table 2.

Table 2: Ordinary least square estimation to determine the p-value and assess for statistical significance

	Estimate	Std. error	t value	p-value
Intercept	1608.8	467	3.445	0.026
Slope	749.8	119.9	6.252	0.003

The slope parameter is estimated to be 749.8 and has a *p*-value of 0.003 which is less than the 0.05 level of significance. This means that the slope is significantly different from zero and since it is positive this means that the increase in trend in health centre use over the years is significant.

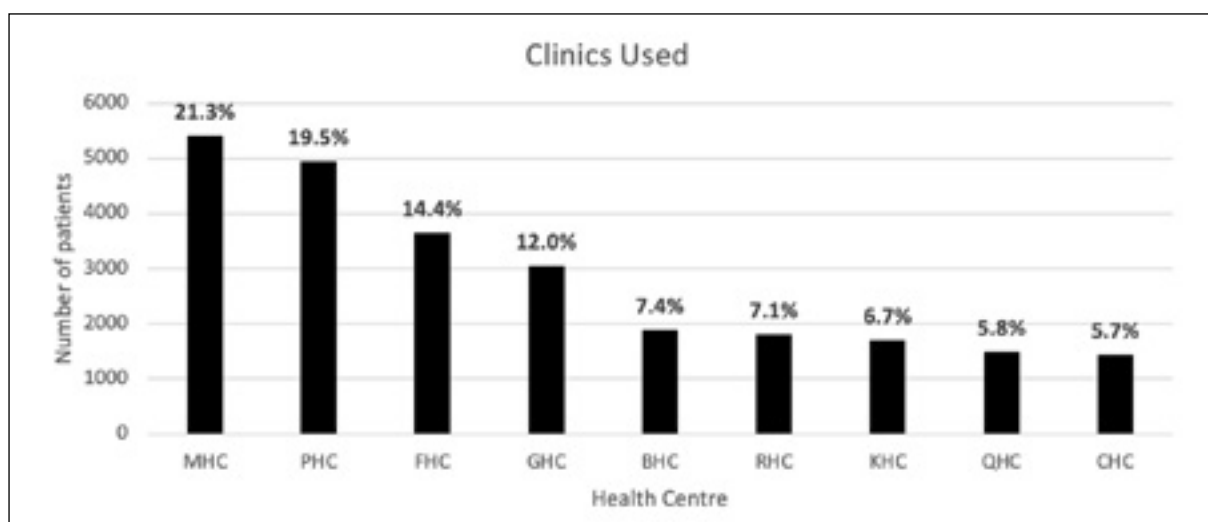


Figure 4: Patient attendance by health centre (MHC – Mosta Health Centre, PHC – Paola Health Centre, FHC – Floriana Health Centre, GHC – Gzira Health Centre, BHC – Birkirkara Health Centre, RHC – Rabat Health Centre, KHC – Kirkop Health Centre, QHC – Qormi Health Centre, CHC – Cospicua Health Centre).

The government health centre which was used mostly was Mosta Health Centre (21.3%), followed by Paola Health Centre (19.5%) and Floriana (14.4%) as depicted in Figure 4. The health centres which were used the least by patients was the Cospicua Health Centre (5.7%), followed narrowly by Qormi Health Centre (5.8%). As shown in Table 3, most patients making use

of the health centre service in Malta were from the Northern Harbour District (30.9%) followed by the Southern Harbour District (23.3%). On the other hand, patients residing in Gozo made up only 0.5% of patients using these clinics in Malta throughout the study period. The authors focused further detailed analysis on the three main health centres.

Table 3: Use of health centres and telephone consultations based on districts. (The Northern Harbour District is composed of Sliema, Birkirkara, Gzira, Ħamrun, Msida, Pembroke, Pietà, Qormi, St Julians, Santa Venera, Swieqi and Ta' Xbiex. The Southern Harbour District is composed of Valletta, Birgu, Bormla, Fgura, Senglea, Floriana, Kalkara, Luqa, Marsa, Santa Lucija, Paola, Tarxien, Zabbar and Xgħajra. The Northern District is composed of Għargħur, Mellieħa, Imgarr, Mosta, Naxxar and San Pawl il-Baħar. The Western District is composed of Attard, Balzan, Dingli, Iklin, Lija, Imtarfa, Rabat, Bahrija, Siġġiewi and Żebbuġ. The South Eastern District is composed of Birżebbuġa, Għaxaq, Gudja, Marsaskala, Imqabba, Marsaxlokk, Qrendi, Safi, Żejtun and Żurrieq.)

District	In clinic consultation	Telephone consultation	Grand Total	Percentage
Northern	3,160	1,403	4,563	17.90%
Western	2,282	1,060	3,342	13.20%
Northern Harbour	5,092	2,744	7,836	30.90%
Southern Harbour	4,081	1,835	5,916	23.30%
South Eastern	2,408	1,133	3,541	13.90%
Gozo	76	59	135	0.53%
Unknown	52	12	64	0.25%
Abroad	1	-	1	0.02%
Grand Total	17,152	8,246	25,398	100%

The EPR also provided information on whether the consultation was face-to-face or telephone based. It was noted that out of 25,398 consultations assessed in this study, 17,152 (67.5%) were face-to-face consultations whilst 8,246 (32.5%) were telephone consultations. Once again, the highest amount of telephone consultations was made within the Northern Harbour catchment area.

As shown in Figure 5, the catchment area of Gzira Health Centre experienced more telephone consultations (51%) when compared to face-to-face clinic consultations (49%). However, the overall majority of patients still preferred face-to-face consultations when compared to telephone consultations.

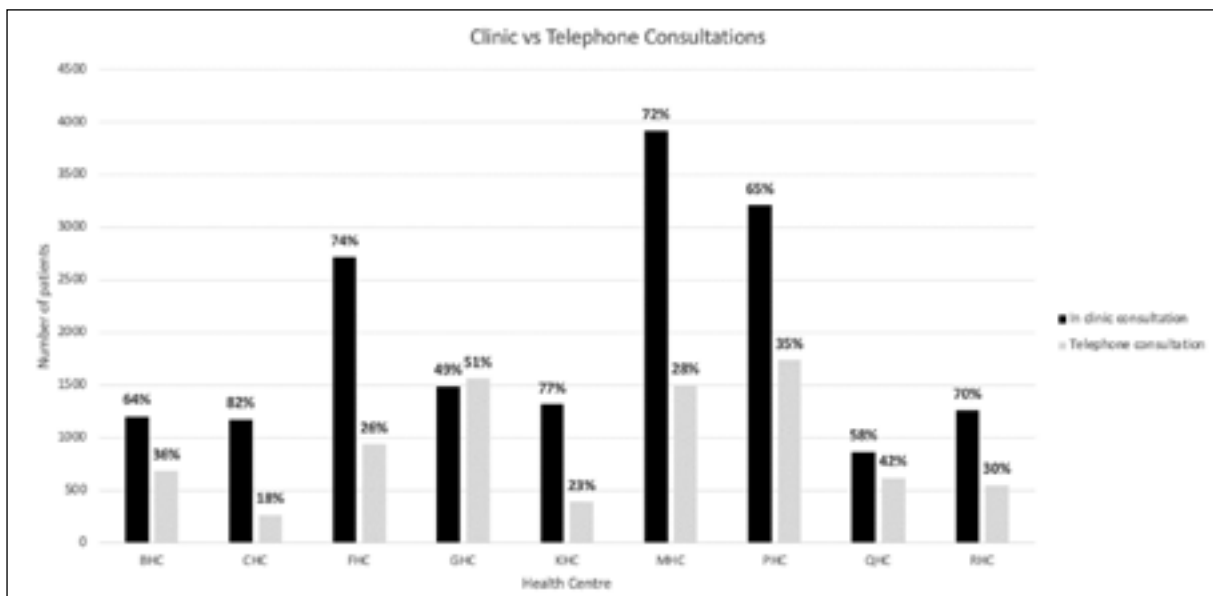


Figure 5: Clinic versus telephone consultations (MHC – Mosta Health Centre, PHC – Paola Health Centre, FHC – Floriana Health Centre, GHC – Gzira Health Centre, BHC – Birkirkara Health Centre, RHC – Rabat Health Centre, KHC – Kirkop Health Centre, QHC – Qormi Health Centre, CHC – Cospicua Health Centre).

Over the years a trend was noted: while telephone consultations were not popular initially during 2020, as the pandemic went on patients became more aware and made use of telemedicine. Thereafter, as depicted in Figure 6 below, the majority of patients opted for face-to-face consultations once again. Furthermore, it was quite interesting to note that the population subgroup that made most use of telemedicine was the 70+ group (37%) (Figure 7).

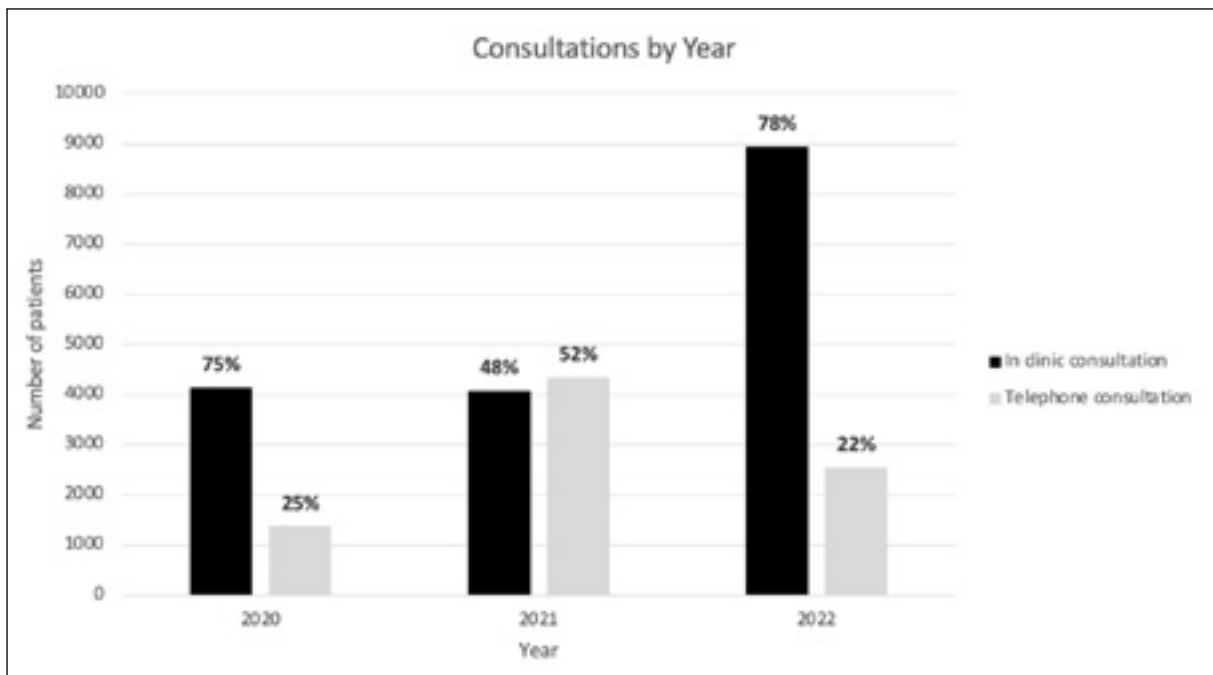


Figure 6: Clinic versus telephone consultations by year

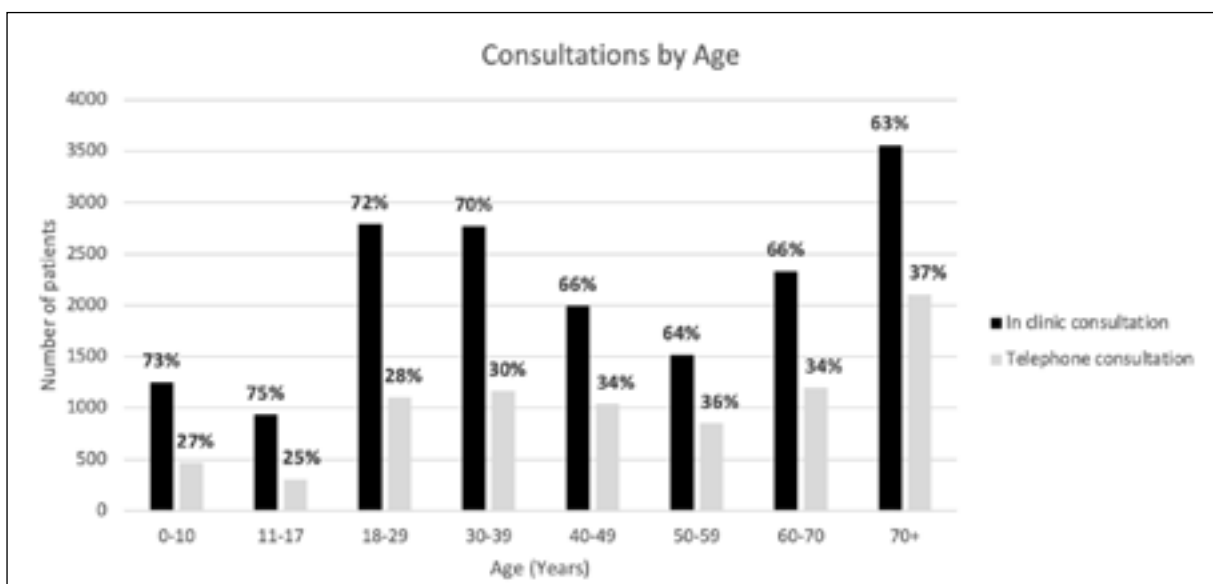


Figure 7: Clinic versus telephone consultations by age of patients in years

DISCUSSION

The primary care system is deemed to be the first line of defense and first point of contact during a pandemic. This system is able to reinforce public health messages, identify those patients in need of inpatient care and also help manage patients at home to avoid extra burden on the local hospitals (Krist et al., 2020).

Use of government clinics

The results clearly show a rise in patients making use of government health centres over the time period as restrictions related to the COVID-19 pandemic eased. Furthermore, there a statistically significant increase in use of these clinics during the summer months when compared to the winter months. This is contrary to this study's hypothesis and other studies

which noted an increase in workload during the winter months. A study carried out by Millwood, Tomlinson and Hopwood, (2021) evaluating nine GP practices in Manchester, United Kingdom noted that during the winter months there was a 61% increase in face-to-face GP consultations and an 81% increase in telephone consultations. This rather paradoxical increase could be also explained by looking at the 'greater picture' and considering part of an overall trend in increasing face-to-face consultations as time elapsed from 2020. In fact, Figure 3 shows an upward progressive increase in patient attendance for each successive period of study. Certainly, this is an interesting result, and future studies could help to shed light onto the present trend.

In line with the argumentation put forward above, there was also a statistically significant rise in the use of these clinics from 2020 to 2022. This is also the case in the United Kingdom where GP consultations increased by 89% from 2020 to 2023 (Green, McKee and Katikireddi, 2022). One possible reason to this noted trend is that patients were apprehensive to leave their households during the peak of the COVID-19 pandemic and resumed to utilizing government health centres as restrictions eased.

Mosta Health Centre was confirmed as the busiest health centre locally, this also correlates with statistics issued by the National Statistics Office as the northern region (81,859) (Regional Statistics Malta, 2022) has a higher number of inhabitants when compared to other regions in Malta. Furthermore, the female population seems to be utilizing these clinics more and this correlates with other studies done abroad (Hunt et al., 2011) and also locally (Baldacchino et al., 2017).

Telemedicine

It is also interesting to note that during this study period 32.5% of consultations were telephone based. This correlates with other studies which stated that in settings such as the US internal medicine and UK primary care, a quarter of doctor-patient interactions occur via telephone (Van Galen and Car, 2018). This was also noted in a study by Green, McKee and Katikireddi (2022)

which noted that the number of telephone consultations trebled from 2020 to 2021. Without a doubt the COVID-19 pandemic has reshaped health care services and as a response to physical distancing and vulnerable patients, the use of telemedicine has emerged. Telemedicine reduces the amount of medical consultations resulting in saving time and cost of treatment for the patient and medical practitioner. It also helps to streamline the workflow of hospitals and clinics resulting in alleviation of the burden of in-clinic consultations (Haleem et al., 2021). Of course, this type of service provision has its challenges and its perks. Indeed, as identified by Sammut et al., (2022), one of the challenges faced by GP trainees during their placement was the inability to examine patients. However, from the data collected, the number of telemedicine consultations was quite high and contributes to some off-loading from face-to-face consultations at health centres.

The pandemic seems to have acted as the catalyst required to propel telemedicine into routine practice. It was noted that in order to provide a sustainable telemedicine service the right structural framework and training to doctors need to be provided (Hasani et al., 2020). Patients aged 70+ made use of this service the most when compared to other population age groups. This correlates with a study done in Japan which also noted that both the younger population and patients aged 70+ increased their use of telemedicine during the pandemic (Miyawaki et al., 2021). However, more research is required to assess the effectiveness and appropriateness of telemedicine consultations. In addition, more research is needed to assess if the older age group of patients is able to keep updated with the ever increasing technological updates associated with such service.

According to Hajek and König (2018), with increasing age individuals become less optimistic about the treatment or may have increased perceived opportunity costs regarding doctor visits. This is contrary to findings in this study as the geriatric subgroup (70+) contributed to the largest population subgroup making use of government health centres.

Face-to-face consultations

This study revealed that face-to-face consultations increased from 2020 to 2022. This might be due to a variety of reasons but primarily, it might have been related to concerns related with morbidity and mortality of COVID-19 and attending clinics. This was also described in other studies abroad where patient consultations dipped especially in the first wave of COVID-19 (Xu et al., 2021). However, thereafter the easing of restrictions resulted in a surge in face-to-face consultations. Another reason as to why patients may prefer face-to-face consultations is that the majority of patients raise more than one issue during a single consultation and thus it might be easier to do so in person rather than via telemedicine (Baldacchino et al., 2017). Another possible explanation is that, as highlighted in a local study, hypertension is the most common comorbidity (Baldacchino et al., 2017). Therefore, patients might request more face-to-face consultations to measure their blood pressure.

Strengths, limitations and recommendation

Strengths

This is the first time that a comparative analysis is being done, as far as is known. All health centres except Gozo health centre were included in the study, thereby giving as broad a perspective as possible for the study.

Limitations

Only two weeks per year were analysed during 2020-2022 and thus, while the data gathered from this study can be useful, it cannot be deemed as conclusive. It should also be noted that in early 2020, EPR was being rolled out in various health centres, and consequently, use of such record keeping by doctors might not have been as efficient as it should be.

Recommendation

Ideally more weeks should be analysed to confirm trends observed in this study.

CONCLUSION

One hypothesis of this study was that throughout the peaks of the COVID-19 pandemic less people made use of government health centers for a medical review. The results of this quantitative analysis demonstrate a statistically significant rise in patients attending the health centres over the time period as restrictions related to the COVID-19 pandemic eased. A second hypothesis of this study was that patients made use of the government health centre services more frequently in winter when compared to summer. However, this study found a statistically significant increase in the use of health centres services during the summer when compared to winter. It was noted that throughout the study period 25,398 patient encounters were recorded.

Over the years a trend was noted where, while telephone consultations were not popular in 2020, as the pandemic progressed patients started making use of telemedicine. As the pandemic restrictions eased, patients opted for face-to-face GP service more, with telephone consultations remaining a minority. Furthermore, it was quite interesting to note that the population subgroup that made use of telemedicine most were those aged 70+.

Educating patients about the use of telemedicine and that its use can be fruitful beyond the pandemic may help reduce the burden of local health centres as a rise in use of these community clinics have been noted over the past three years. Further research is required to assess the public and general practitioners' knowledge, perspectives, and attitudes on telemedicine and whether the implementation of telemedicine has reduced the workload on Maltese health centres.

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Communication between primary health care and the emergency department during transfer of care of patients in Malta

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ABSTRACT

Background

Communication is important within the healthcare system. Communication failure can have negative effects on patients as it can result in adverse events.

Objective

To investigate the communication between the emergency department and primary health care in Malta using qualitative methods.

Method

The data for this study was collected via semi-structured interviews conducted in 2021-2022. The interviews were carried out online for convenience and safety measures due to COVID-19. The data collected was qualitative in nature. Twelve participants were involved in the study: four from the emergency department, four from private general practice and four from public general practice. The data collected was transcribed. The transcripts were confirmed with the participants, and analysed using the thematic analysis method to elicit common themes.

Results

The themes elicited were introduction to roles and similarities between them; frequency of communication; reasons for communication; the current methods of communication and opinions; recommendations; nurturing relationships and respect; and the physician's perception of the patient's experience.

Conclusion

Participants shared different ideas on how to improve communication and inter-personal relationships. The consensus was that, over the years, there has been an improvement in communication. However, there was still room for improvement. Several participants were in favour of improving direct contact, mainly by calling.

Keywords

Communication; general practice; emergency department; interaction; interprofessional relationship.

INTRODUCTION

Ineffective communication impacts patients negatively due to delays in treatment, medication errors, misdiagnosis, injury and even death (Foronda, MacWilliams and McArthur, 2016).

Interprofessional communication can occur via several means. These are divided into synchronous communication and asynchronous. Synchronous communication happens in real time such as meetings, phone calls, ward rounds and conversations. Asynchronous communication doesn't happen in real time. Examples include messages on white boards, notes and medication orders. (Foronda, MacWilliams and McArthur, 2016)

In the Maltese healthcare system, communication methods are not as effective as desired, especially between primary and secondary healthcare. Traditionally, the main methods are paper based: ticket of referral and discharge summary, both of which have been criticised as having a dubious standard. (Attard, Gauci and Mamo, 2017)

The main aims of this research are twofold:

1. To understand what doctors working in primary health care and the emergency department feel about the current communication system and
2. To explore and understand what their ideas of doctors working in the two areas are when it comes to improving communication between the two sites.

For this reason, this research will delve into the ideas, concerns and expectations as expressed by doctors working in the two sectors and analyse these to provide suggestions for improvements.

METHOD

This study's design was based on the literature review that was conducted prior to the study and the research questions:

- What are the thoughts of doctors in general practice (GP) and the emergency department regarding the current communication system between the two areas?
- What would be the method of choice for improvement?

The research was conducted by an interview. Several factors were kept in mind during its design:

- Time required to conduct the interview;
- Time required for data analysis and evaluation;
- Comfort of participants in sharing their views, thoughts, and feelings;
- Anonymity and data protection of participants.

Since there was no previous local study regarding communication between GP and the emergency department for comparison, the aim was to elicit basic data regarding the current system of communication between the two. Therefore, a phenomenological approach was adopted.

The target population included participants who had been working as doctors for at least two years and specialising in family or emergency medicine and private general practitioners (GPs):

- Emergency department physicians;
- Private GPs;
- Public GPs (health centres).

Triangulation was achieved by using more than one source to gather the viewpoints regarding communication between the emergency department, health centres and private GPs. This type of triangulation is called 'data triangulation' as different times and people were used to collect the data (Wilson, 2014). The other method used was 'investigator triangulation'. This is when more than one person is involved in the data collection and analysis process (Wilson, 2014). In this case, an assistant was involved in data analysis. This helped to improve the strength of the study along with reaching saturation and its usefulness to the local healthcare system as, to the knowledge of the researcher, this was the first study with respect to communication between primary healthcare and the emergency department.

After gaining the proper permissions from the departments in question and ethical clearances from the Faculty Research and Ethics Committee, the Mater Dei Hospital Data Protection Office and the Primary HealthCare Department, an email was sent to the departments in question to be forwarded to their doctors. This technique provided a poor response. Therefore, other

methods of sampling were used which were convenience sampling and snowball sampling.

A pilot study was conducted to:

- Assess the wording and flow of the interview questions;
- Test out the feasibility of time allocated for each interview;
- Assess the feasibility of online meetings and comfort of participants.

All the assessed factors were found to be more or less as predicted.

It was deemed acceptable to include data collected from the pilot study into the final analysis since the study was a qualitative one. Since insights were gained from each interview and there were no major changes made to the interview questions or new unpredicted factors, the contamination of data analysis by including the pilot study was not regarded as a cause for concern (van Teijlingen and Hundley, 2002).

Thematic analysis was used for analysis. This can be used for identification, analysis, organisation, description and reporting of themes that can be found in the gathered data (Nowell et al., 2017). The steps taken were:

- Familiarisation with the data;
- Generating the first codes;
- The search for themes;
- Theme review;
- Naming and defining themes;
- Production of the report.

Limitations of this study include the lack of diversity of participants' experience and the lack of inclusion of physicians working in Gozo and the paediatrics emergency department.

RESULTS

The result of the analysis was condensed and formatted in one table (Table 1). This was done with the intention of providing a pictorial representation of the process that was undertaken from one step to the other.

Table 1, part 1: results of analysis

DATA EXTRACTS	CODES & SUB-CODES	SUB-THEMES	THEMES
Quotes from participants	GP in Public primary Health Care System	Introducing to the Participants	The Workplace of the Participants
	• GP in both public and private Group Practice		
	Private GP Physician		
	Emergency Department Doctor	The Workplace of the Participants	
	Blurred lines between GP and the Emergency Department		
	GPs know their patients better	The Workplace of the Participants	
	Environment of the Emergency Department		
Quotes from participants	Environment of GP		
	Frequency of communication with GP	Frequency for Communication	Frequency for Communication
Quotes from participants	Frequency of Communication with the Emergency Department		
	Communication with the Emergency Department	Reasons for Communication	Reasons for Communication
	Communication with GP		
	Referring to the Emergency Department for tests not emergencies		
	Urgent vs Emergency		

Table 1, part 2: results of analysis (continued)

DATA EXTRACTS	CODES & SUB-CODES	SUB-THEMES	THEMES
Quotes from participants	Continuity of Care and Follow up	Communication when referring Patients to the Emergency Department Communication when discharging the Patient back to the Community Recommendations for Improving Communication	The Current Methods of Communication and Opinions; Recommendations
	Methods of Communication from GP to the Emergency Department		
	• Phone		
	• Ticket of Referral		
	Methods of Communication from the Emergency Department to GP		
	• Phone		
	Quality of Communication		
	• Discharge Note		
	• Ticket of Referral		
	Digitalisation of notes		
	• Integration of systems		
	Feedback after referral to the Emergency Department		
	• Feels requests are ignored		
	Feels that Ticket of Referral is ignored		
• Feels requests are ignored			
• Patients feedback on Ticket of Referral			
Importance of Ticket of Referral at the Emergency Department			
Other possible Systems to use for Communication			
Private GP Physician access to booking of tests and results			
Reasons for more Direct Communication			
Review of System			
• Work Practices			
Fast Track for urgent cases but not emergencies			
'Warm' Handover			
Quotes from participants	Respect between Professionals	Respect between Professionals	Nurturing Relationships and Respect
	Effect of Interpersonal Relationship	Improving Relationships	
	Improves Communication and Interpersonal Relationships		
	Hinders Communication and Interpersonal Relationships	Barriers to Relationships	
	Impression of the Emergency Department on referrals from GP		

Table 1, part 3: results of analysis (continued)

DATA EXTRACTS	CODES & SUB-CODES	SUB-THEMES	THEMES
Quotes from participants	Patient's impression and reaction about GP	Impression and Reaction as understood by the Physicians	The Physician's Perception of the Patient's Experience
	• Care at GP		
	Patient's impression and reaction about the Emergency Department	Health Care Use	
	• Care at the Emergency Department		
• Medical Complaint			
	Patient's attitude affecting Transfer of Care		
	• Discharge from the Emergency Department		
	• Explanation to the Patient		
	• Medical Complaint		
	Education regarding use of the Emergency Department		

DISCUSSION

The participants are referred to as:

- Emergency Doctors: Pilot ED; ED 1; ED 2; ED3;
- Private GPs: Pilot Private GP; Private GP 1; Private GP2; Private GP3;
- Public GPs: Pilot Public GP; Public GP 1; Public GP 2; Public GP 3.

The workplace of the participants (Table 1, part 1)

GP in Malta can be split into two sectors: private (solo where the physician works on his/her own, in a small group practice or a large group practice) (Khoo, Lim and Vrijhoef, 2014) and public. There is only one official emergency department.

The emergency department is quite busy. This was acknowledged by most of the participants.

“All the staff there and all doctors and nurses work a lot and are literally working all the time. So you know, there is an admiration to all people working there.” (Private GP 3)

A hectic environment impacts and hinders interpersonal communication (Karam et al., 2017). According to Jafari Varjoshani et al. (2014), this is one of the main barriers preventing proper information exchange

between professionals, and impacts patient care, resulting in patient suffering.

The threatening effect of poor communication on the patient's outcome is well known (Boddy et al., 2021). The emergency department is estimated to have the highest number of medical errors, 53%-82%, compared to the inpatient department at 27%-51% (Jafari Varjoshani et al., 2014).

The GP environment is calmer. However, this doesn't mean it does not get hectic. According to a study in Singapore, public GPs have a heavy patient load when compared to private practices as it was calculated that polyclinics see an average of 58 patients per day, while those in private see 30 patients (Khoo, Lim and Vrijhoef, 2014). However, it was also estimated that private GPs were responsible for 80% of primary healthcare (Khoo, Lim and Vrijhoef, 2014). This was acknowledged by one of the participants:

“I do know that health centres are very busy with a different kind of patient. Again, I mean, being very busy will result in things having to be fast tracked. So yes, that will negatively impact communication, I believe.” (ED 3)

This inclines one to think that recognition of a busy GP environment by the emergency department may help in improving interpersonal relationships and enhance cooperation and communication.

Frequency of communication (Table 1, part 1)

The frequency of communication depends on who is at the receiving end, the level of seniority and the method of communication in question.

Telephone communication frequency was not that high, which is consistent with the claim by Luu et al. (2016) who claimed that direct communication between healthcare providers is uncommon.

"Phone...maybe once every two weeks or a month? Doesn't happen that often." (ED 3)

When it comes to paper-based communication, the experience of emergency doctors with tickets of referral was considerably higher.

"On a daily basis I see 3 cases, something like that." (ED 1)

The frequency of communication initiated from GP depends on the method of communication. For telephone communication, the participants gave different responses. However, almost all of them had a rate that was quite low, ranging from a couple of times a month to a couple of times a year. This is dependent on the GP's experience and confidence, especially in complex cases.

"At least two-three times a week." (Pilot Public GP)

Rates of referred patients to the emergency department is also dependent on the physician. This depends on the GP's experience, confidence and cases presenting in the clinic.

Reasons for communication (Table 1, part 1)

This was succinctly explained by Public GP2:

"Mostly when I am dealing with an emergency situation....Giving them over for a patient that I'm going to send over from the clinic over to them... to give them heads up about what's coming their way, especially if it's a very urgent situation....I call our colleagues at the emergency department if I am unsure about a clinical decision about a patient and I would like to their advice or their output on a particular situation" (Public GP 2)

Pilot Public GP, Public GP 1 and Public GP 3 gave similar reasons. In addition, Pilot Public GP also stated that sometimes urgent cases are still referred as they couldn't wait for an outpatient appointment. This is well known as "considerations go beyond medical urgency" (Oslislo et al., 2019). Private GPs gave similar reasons. Public GP 3 (who works both privately and publicly) commented that contact with the emergency department is initiated more often in private practice. Although there were no further comments about this, one possible reason could be that private practice has less support. The GP participants' comments were also confirmed by ED 1. One other mentioned reason was the need for investigations that cannot be booked or carried out at primary care.

Current methods and opinions; preferred systems, recommendations (Table 1, part 2)

The three main methods mentioned by participants were phone calls, tickets of referral and discharge notes, all of which confirm the findings of Knight's (2019) study.

A major drawback when using paper-based referrals includes missing details if the referrer is unaware of what is required by the emergency physician. A local study assessing quality of tickets of referral to the vascular clinic discovered that quality was poor and often had missing details (Chetcuti, Farrugia and Cassar, 2009). This was in agreement with another local study assessing the quality of referrals to the surgical outpatients (Cassar et al., 2016). Unfortunately, this still seems to be an issue as Pilot ED commented that improvement regarding tickets of referral was needed.

An adequate ticket of referral can be viewed as a form of respect (Karam et al., 2017) and a key factor that negatively impacts communication and patient care (Nash, Hespe and Chalkley, 2016). This sentiment was echoed by Pilot ED who felt that an incorrectly filled ticket of referral was disrespectful.

Discharge notes are usually the sole communication between primary and secondary healthcare on discharge from secondary healthcare (Markiewicz et al., 2020) which involves transfer of responsibility back to the GP (Attard, Gauci and Mamo, 2017). The usefulness of discharge notes was echoed by several participants, confirming the current literature although there were also complaints regarding the quality.

“Unfortunately, sometimes, I think that they’re a bit insufficient” (Public GP1)

Calling is quicker when compared to paper-based communication and viewed as the most valuable by the participants. Locally, this method is used by GPs when an ambulance is needed, for handover and discussion of particular cases, and to seek advice when there is uncertainty regarding management. Apart from its ease, calling also allows discussion and passing on the required details. Suggestions from previous research show that urgent referrals should be accompanied by a phone call (Attard, Gauci and Mamo, 2017).

However, this has its disadvantages. If this were to be done for every patient, waiting time increases. To counteract this issue, Public GP 2 suggested assigning a doctor responsible for answering phone calls, like in telemedicine. There is no guarantee that the doctor, whom the GP spoke to on the phone, would see the patient themselves and this may result in wasted time. A GP participant mentioned a system of asking the patient to call them when they are being attended to by the emergency doctor. Although not always possible, this improves continuity of care and giving the necessary details to the doctor managing the patient. This has been proven to increase communication and

collaboration between the two caring physicians (Karam et al., 2017).

It was also noted by participants that, although paper-based communication from secondary healthcare seemed to be lacking when produced by someone inexperienced, the younger GP generation produced paper-based referrals of better quality, which could be explained by the ongoing training process of GP trainees.

As observed by participants, the consensus was that the quality of current communication, “could be better” (Public GP 3), that there is “lack of detail” (Pilot Public GP) and that, although there was an element of satisfaction, more could be done for improvement. One of the suggestions from participants was the use of electronic communication such as emails as it gives feedback directly to the referring doctor. However, email boxes can become overloaded and reading emails require time that may not be available (Attard, Gauci and Mamo, 2017).

Other suggestions included:

- A chat system combining the convenience of emails and real-time answer of a phone, without requiring users to stop what they are doing. (Considering that the internet would probably have to be used, one needs to think about matters of privacy and prevent hacking. This could threaten patient confidentiality and, unless a secure platform is provided, should not be attempted.)
- Integration of GPs during triage to determine the primary care cases.
- Increase access to investigations for GPs (particularly privately).
- Digitalisation and access to each other’s medical notes.
- A feedback loop for communication between the referrer and discharging doctor.

Respect and nurturing relationships (Table 1, part 2)

Respect improves working environments and relationships (Mann, Lown and Touw, 2020). Most of the participants agreed with current literature that respect improves both (Mann, Lown and Touw, 2020). Most of the participants didn’t have major issues regarding respect between the

departments; however there were complaints regarding the way the system works. Some also mentioned that the acquaintance of colleagues from the other department proved helpful when needing to communicate.

However, some participants from the GP side felt disrespected. Possible reasons for relationship barriers mentioned include:

- Unprofessional and unethical behaviour;
- Inflated self-image;
- The status quo;
- Impersonal communication and lack of human touch;
- Rigid hierarchies.

Some participant ideas for improvement were:

- Networking events to foster familiarity (especially informal ones) (World Health Organization, 2016).
- Joint continuing medical education (CME) events.

The physician's perception of the patient's experience (Table 1, part 3)

Although patients' attitude can set the baseline for the relationship between the emergency doctor and GP, none of the participants mentioned anything of a similar note. Therefore, it was assumed that no participant felt this was an issue.

According to Greenfield et al. (2016), there are also other motives behind patients' attitudes:

- Anxiety
- Convenience

"Some people think that it was a waste of time going there [GP] and the following time they would rather go directly to the emergency department." (Public GP 3)

- Believing that hospital care is superior and seeking faster access to hospital care

"Sometimes we do have this mentality that if someone has something serious or what the patient thinks it's something serious, they should never go to the general practice physician they should just go immediately to the emergency department" (ED 1)

- Dissatisfaction with GP - this was not felt to be a local issue

"Most patients I would say, are quite accepting, very rarely we have patients who say: 'I've already been to the general practice physician multiple times they can't do anything; they didn't do anything to me'" (ED1)

- Being unregistered with a GP

"There has to be more awareness about what primary health care services offer, what secondary health care services offer and what the emergency department...what is actually an emergency case. A particular group would be foreign patients, who wouldn't know how the system works." (Public GP 3)

- Absence of self-care skills

CONCLUSION

The participants felt that, although there has been improvement, there is still more that needs to be done.

Research on this topic is still needed, especially when it comes to methods for improving communication and the interprofessional relationship between the emergency department and primary care.

Participants' ideas on how this can be helped were: improving phone calls, especially by introducing a system like telemedicine where an emergency physician is responsible for the 'hotline' between the emergency department and GP; improving triage by inclusion of a GP to help differentiate between patients who need the emergency department from primary healthcare; registration of patients with their GP to improve continuity of care; improving the quality of tickets of referral; improving access and digitalisation of each other's notes (both private and public); and improving interpersonal relationship by conducting CME events, training and team building events together and providing feedback to each other.

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A narrative review of anaemia in the elderly in a primary care setting

Dr Melanie DEBONO and Dr Marco GRECH

ABSTRACT

Background

Anaemia in the elderly is a common finding. Its causes are multiple and its management will depend on the underlying cause.

Objective

The aim of this article is to review the latest literature on anaemia in the elderly with a specific focus on the primary care setting.

Method

A search for review articles using the MeSH words "Elderly" OR "Older People" OR "Older Persons" or "Age 65+" AND "anaemia" OR "anemia" AND "primary care" was carried out on Medline EBSCO for articles in English published between 2012 and 2022. The PRISMA guideline was followed in the selection of articles to ensure research rigour. The initial search yielded 931 articles which were finally reduced to 17 articles.

Results

The topics discussed in the selected articles were varied. The vast majority gave a broad overview of anaemia. Others focused on specific aspects of anaemia like treatment, iron deficiency anaemia, autoimmune hemolytic anaemia, chronic kidney disease, the role of nutrition and the inflammatory pathways leading to anaemia.

Discussion

The authors focused on themes that came out of the selected papers, namely: symptoms and significance, causes, approach to investigations and therapeutic options.

Conclusion

Anaemia is a common finding in the elderly population and it should not be considered as a normal aging process. Proper investigation can frequently elucidate the cause and provide adequate treatment.

Keywords

Anaemia, elderly, older people, primary care

Abbreviations and acronyms used in the article

AA	Aplastic anaemia
AHA	Autoimmune haemolytic anaemia
AI	Anaemia of inflammation
CCUS	Clonal cytopenia of undetermined significance
CHIP	Clonal haematopoiesis of indeterminate potential
CKD	Chronic kidney disease
DAT	Direct antiglobulin test
EPO	Erythropoietin
GI	Gastrointestinal
Hgb	Haemoglobin
HIV	Human immunodeficiency virus
ICUS-A	Idiopathic cytopenia of unknown significance with anaemia
IDA	Iron deficiency anaemia
MCV	Mean corpuscular volume
MDS	Myelodysplastic syndrome
TACO	Transfusion associated circulatory overload
TRALI	Transfusion related acute lung injury
UA	Unexplained anaemia

INTRODUCTION

Anaemia is defined as a reduced oxygen carrying capacity of the body due to a decrease in the red blood cells or the haemoglobin (Hgb) concentration. In 1968, the WHO study group published two cut-offs to define anaemia, a Hgb <12gd/L in females and <13gd/L in males. Even if the cohort used to measure these two values consisted of healthy young Caucasians, excluding elderly over 65 years of age, these measures are still used to this day (World Health Organization, 1968).

In the elderly, anaemia is extremely common, probably because other diseases are also more prevalent with increasing age. Despite this, Guralnik et al. (2004) reasoned that anaemia should not be considered as an inevitable consequence of aging and it may be useful to identify it and any underlying cause as many treatment options are available. Causes are varied and, in some patients, two or more pathologies may contribute to their low Hgb

level. Management will depend on the underlying cause, the severity, as well as the patient's general condition.

The aim of this review was to evaluate the latest evidence on anaemia in the elderly and summarise the findings.

METHOD

In this narrative review the authors sought to evaluate the literature available on the topic of anaemia in the elderly with a particular focus on the primary care setting. This will help to identify any gaps in knowledge. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guideline was used to ensure rigour in research (Page et al., 2021).

Study designs

This narrative review included systematic reviews published over the past 10 years (2012-2022), in the English language. For an article to be included in the authors' selection, the article needed to discuss anaemia in the elderly.

The authors searched the Medline EBSCO database for relevant articles. Each author performed a separate search, and any disagreements were resolved by consensus. The search was restricted to one major database to keep this review manageable and because of the resources available.

The following search words were used: "Elderly" OR "Older People" OR "Older Persons" or "Age 65+" AND "anaemia" OR "anemia" AND "primary care".

The following filters were applied: English language, age over 65, full text available and systematic review.

The initial search yielded 931 articles. The title of each article was then scanned for appropriateness and for duplicate articles. This search resulted in 842 articles being rejected leaving 89 articles for further evaluation.

The abstract of each remaining article was then read. This process resulted in the elimination of a further 65 articles with the remaining 24 articles being selected for this review.

Review of the full text of these articles eliminated another 5 articles. A further 2 articles were eliminated as their full text was

not available. Thus, 17 articles were selected for this review. Table 1 lists these articles. Figure 1 graphically explains the selection process.

Table 1 - The articles selected for this review

	Authors	Date of publication	Title
1	Stauder, R., Valent, P. and Theurl, I.	2018	Anemia at older age: etiologies, clinical implications, and management
2	Andres, E. et al.	2013	Anemia in elderly patients: new insight into an old disorder.
3	Katsumi, A. et al.	2021	Anemia in older adults as a geriatric syndrome: A review.
4	Lanier, J.B. et al.	2018	Anemia in Older Adults.
5	Girelli, D., Marchi, G. and Camaschella C.	2018	Anemia in the Elderly.
6	Halawi, R., Maukhadder, H. and Taher, A.	2017	Anemia in the elderly: a consequence of aging?
7	Röhrig, G	2016	Anemia in the frail, elderly patient.
8	Gadò, K. et al.	2022	Anemia of geriatric patients.
9	Barcellini, W., Fattizzo, B. and Cortelazzi, A.	2018	Autoimmune hemolytic anemia, autoimmune neutropenia and aplastic anemia in the elderly.
10	Goodnough, L.T. and Schrier, S.L.	2014	Evaluation and management of anemia in the elderly.
11	Tavenier, J. and Leng, S.X.	2019	Inflammatory Pathways to Anemia in the Frail Elderly.
12	Joosten, E.	2018	Iron deficiency anemia in older adults: A review.
13	Musio, F.	2019	Kidney Disease and Anemia in Elderly Patients.
14	Bianchi, V.E.	2016	Role of nutrition on anemia in elderly.
15	Silay, K. et al.	2015	The status of iron absorption in older patients with iron deficiency anemia.
16	Busti, F. et al.	2019	Treatment options for anemia in the elderly.
17	Alvarez-Payares, J.C. et al.	2021	Unexplained Anemia in the Elderly.

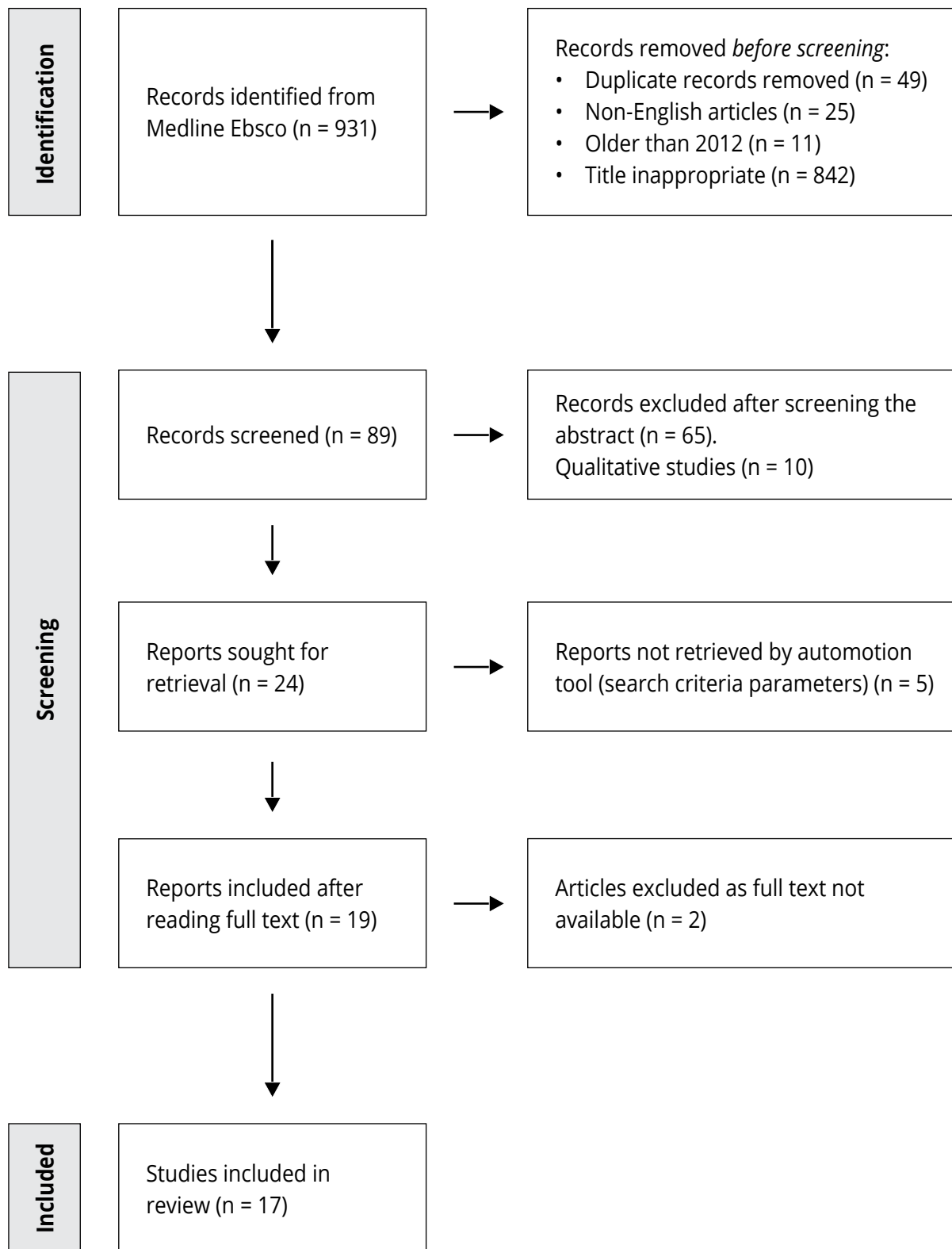


Figure 1: Selection process flowchart

RESULTS

Nine of the retrieved articles presented a general overview of presentation, diagnosis and management of anaemia in the elderly population (Andrès et al., 2013; Goodnough and Schrier, 2014; Röhrig, 2016; Halawi, Moukhadder and Taher, 2017; Stauder, Valent and Theurl, 2018; Girelli, Marchi and Camaschella, 2018; Lanier, Park and Callahan, 2018; Katsumi et al., 2021; and Gadó et al., 2022). Treatment of anaemia was the main discussion point in Busti et al. (2019). Joosten (2018) and Silay et al. (2015) focus on iron deficiency anaemia. Unexplained anaemia in the elderly was the subject reviewed by Alvarez-Payares et al. (2021). Bianchi (2016) discussed the role of nutrition in the development of anaemia in the elderly, whereas Musio (2019) explored the role of chronic kidney disease (CKD) in the development of anaemia in the elderly. Tavenier and Lang (2019) discussed the inflammatory pathways of anaemia in this age group and Barcellini, Fattizzo and Cortelezzi (2018) explore autoimmune hemolytic anaemia in the elderly.

Following the thematic analysis, the following themes were identified:

1. Symptoms and significance of anemia in the elderly
2. Causes of anemia in the elderly
3. Approach to investigation of anemia in the elderly
4. Therapeutic options.

DISCUSSION

The discussion will follow the themes identified in the thematic analysis.

1. Symptoms and significance of anaemia in the elderly

Anaemia, even when mild, may significantly affect quality of life in the elderly, both in physical and cognitive faculties. Many studies observed that, apart from being associated with frequent hospitalization and prolonged hospital stay as well as cardiovascular events, falls, cognitive

impairment and mental well-being, it is also a marker for increased morbidity and mortality (Stauder, Valent and Theurl, 2018; Andrès et al., 2012).

Most elderly patients will often have only minor Hgb reductions and therefore many will be asymptomatic. The commonly associated symptoms of anaemia, such as fatigue, exertional dyspnoea and tachycardia, will be present in varying degrees of severity in this cohort of patients. Additionally, other subtle signs and symptoms might prevail, and these include confusion, apathy and falls (Andrès et al., 2012).

The patients might also complain of symptoms related to the pathogenesis of the disease. Patients with haematonic deficiencies can present with hair and nail changes such as hair loss and leukonychia seen in iron deficiency anaemia (IDA) and glossitis in cobalamin (B₁₂) and folate (B₉) deficiency (Andrès et al., 2012). In the elderly, IDA has been linked to restless legs syndrome (Joosten, 2018). Very rarely, Vitamin B₁₂ deficiency presents with neurological symptoms. Patients with anaemia arising from bone marrow disorders may complain of recurrent infections associated with low or dysfunctional leukocytes and bleeding problems due to a low platelet count (Gadó et al., 2022).

2. Causes of anaemia in the elderly

There are a multitude of possible causes, and an easy classification would be according to the mean corpuscular volume (MCV). Table 2 gives a comprehensive list of common causes of anaemia in the elderly based on the MCV and the relevant investigations needed. Investigations can be guided by the MCV but it is important to consider that dual pathology may be present and patients may have a dimorphic picture.

Table 2 - Classification showing different causes of anaemia in the elderly based on the mean corpuscular volume (MCV) and suggested investigations.

	Possible causes	Investigations suggested	Other specialist investigations to consider
Microcytic <80fL	<ul style="list-style-type: none"> • Iron deficiency anaemia - chronic blood loss from GI or urinary tract, nutritional, malabsorption • Haemoglobinopathies such as thalassaemia 	<ul style="list-style-type: none"> • Blood film • Ferritin, iron profile • Haemoglobinopathy screen • Coeliac screen 	<ul style="list-style-type: none"> • If IDA confirmed, consider endoscopy study +/- ultrasound abdomen +/- capsule endoscopy
Normocytic 80-100fL	<ul style="list-style-type: none"> • Chronic kidney disease • Low EPO levels • Haemolysis (hypersplenism, mechanical valves, autoimmune - extravascular / intravascular) • Bone marrow infiltration causing reduced production of red cells. May include cancers such as lymphoma, multiple myeloma, breast cancer metastasis or infection such as HIV, parvovirus • Anaemia of inflammation 	<ul style="list-style-type: none"> • Blood film • Reticulocyte count • Renal profile • C-reactive protein, erythrocyte sedimentation rate • Antinuclear antibody and autoimmune screen • Serum protein electrophoresis and immunoglobulins; serum calcium 	<ul style="list-style-type: none"> • Serum EPO levels • Ultrasound abdomen and kidneys • Lactate dehydrogenase • Serum haptoglobin and direct antiglobulin test • Bone marrow aspirate and trephine biopsy • Molecular, cytogenetic and flow cytometry • Virology screen
Macrocytic >100fL	<ul style="list-style-type: none"> • Folate deficiency • Vitamin B₁₂ deficiency • Myelodysplastic syndromes • Haemolysis • Liver disease • Alcohol misuse - associated with malnutrition and liver disease • Drug-included - chemotherapeutic agents such as hydroxyurea or antimetabolites such as methotrexate or phenytoin (these cause folate deficiency) • Thyroid disorders 	<ul style="list-style-type: none"> • Blood film • Haematinic screen - vitamin B₁₂ and folate • Liver profile • Thyroid function tests • Coeliac screen 	<ul style="list-style-type: none"> • Anti-intrinsic factor antibody, anti-parietal cell antibody

With regards to the nutritional anaemias, IDA is usually the most common (Silay et al., 2015). Identifying it is beneficial as various treatments are available and in less frail patients it might be appropriate to search for a possible cause of occult blood loss. Commonly, this would be bleeding from the gastrointestinal (GI) tract such as peptic ulceration, gastritis, polyps and cancers. Concerning folate or vitamin B₁₂ deficiency, malabsorption in the elderly is usually more often due to age-related decreased GI absorption and polypharmacy, rather than coeliac, pernicious anaemia or inflammatory bowel disease (Stauder, Valent and Theurl, 2018). Poor diet may be related to social isolation, decreased cognitive function and financial circumstances. The Food-Cobalamin Malabsorption syndrome, associated with Vitamin B₁₂ deficiency, is the failure of cobalamin to be released from food or transport proteins in the setting of hypochlorhydria. This occurs in atrophic gastritis and chronic gastritis, *Helicobacter pylori* infections as well as drugs such as omeprazole and metformin, all extremely common in the elderly (Halawi, Moukhadder and Taher, 2017).

Another significant cause of anaemia in the elderly is anaemia of chronic disease or as it is now known as anaemia of inflammation (AI). This is extremely common and various interrelated mechanisms are believed to be responsible. One example would be the decreased proliferation of red cell precursors in the presence of increased inflammatory cytokines, mostly IL-1, IL-6 and tumour necrosis factor (Tavenier and Lang, 2019). Reduced production of erythropoietin (EPO), together with a diminished response to it, occurs in AI and this can occur in the absence of CKD. Moreover, the protein hepcidin decreases iron absorption and release from macrophages. Hepcidin is an acute phase reactant and is increased in AI, cancer patients, chronic infections and autoimmune conditions (Girelli, Marchi, and Camaschella, 2018). This statement also holds true for the protein ferritin, which is often found to be increased in inflammatory conditions. A third mechanism causing anaemia related to inflammation is by means of increased

eryptosis, which is the death of red cells. Diseases in which eryptosis is common, such as diabetes and congestive heart failure, are also extremely prevalent in the elderly. The term inflammaging has been coined to describe the generalized, low-grade, chronic inflammation that occurs in association with aging (Röhrig, 2016). Anaemia in the setting of CKD arises not solely due to decreased EPO production but also because of background chronic inflammation, malnutrition and iron deficiency (Musio, 2019).

Haematological disorders are uncommon causes of anaemia but some do occur with increasing incidence in the elderly. A classic example is myelodysplastic syndrome (MDS) which is primarily considered to be a disease of the elderly. It comprises of a group of heterogenous disorders featuring dysplasia and ineffective haematopoiesis in one or more of the bone marrow cell lines. Multiple myeloma and chronic lymphocytic leukaemia are two other haematological disorders which are especially found in older patients (Gadó et al., 2022).

With age, antibodies directed against self are found with increased frequency, most often without developing into an established clinical disorder. Two autoimmune mechanisms by which anaemia can result include autoimmune haemolytic anaemia (AHA) and aplastic anaemia (AA). AHA is diagnosed by means of the direct antiglobulin test (DAT) and is classified as warm, cold or mixed depending on the temperature at which the auto-antibody against red cells is active. It can be primary but in most cases it is secondary to solid or haematological cancers, drugs and infections (Barcellini, Fattizzo and Cortelezzi, 2018). In AA the autoantibodies are directed toward haemtopoeitic stem cells. Intravascular haemolysis is also observed in patients with prosthetic valves and stents. Amongst the complications of haemolysis which include gallstones and kidney disease, the most common are thrombosis and infections, especially in asplenic patients. Identifying haemolysis at an early stage may avoid these (Barcellini, Fattizzo and Cortelezzi, 2018).

When extensive investigations do not reveal a cause for their anaemia, patients are often labelled as having unexplained anaemia (UA). Alvarez-Payares et al. (2021) described how bone marrow tests in elderly patients often show somatic mutations in their red blood cells leading to clonal hematopoiesis. In patients with no cytopenias this is termed as clonal hematopoiesis of indeterminate potential (CHIP). However, these mutations often cause cytopenias and then these patients will be diagnosed to have either clonal cytopenia of undetermined significance (CCUS) or MDS. Patients who are found to have anaemia without molecular abnormalities are diagnosed with idiopathic cytopenia of unknown significance with anaemia (ICUS-A). CHIP and CCUS may develop into MDS, which may or may not predispose to acute myeloid leukaemia (Alvarez-Payares et al., 2021). There is also a great degree of clinical overlap between paroxysmal nocturnal haemoglobinuria, AA and MDS (Barcellini, Fattizzo and Cortelezzi, 2018).

Anaemia can also arise in the context of pancytopenia secondary to bone marrow suppression which can occur with infections such as human immunodeficiency virus (HIV), tuberculosis, leishmaniasis, Parvovirus B19, drugs and infiltration with malignancy (Barcellini, Fattizzo and Cortelezzi, 2018).

In their review, Katsumi et al., (2021) mention low testosterone levels and trace element deficiencies as a possible mechanism of unexplained anaemia. They describe how copper deficiency can lead to a clinical picture similar to MDS. It can occur after gastric surgery or in patients on zinc supplements, which impairs copper absorption. Girelli, Marchi and Camaschella (2018) claim that Vitamin D deficiency was also found to be related to low Hgb levels. In some patients, even after extensive investigation, the cause of the anaemia still remains unclear.

3. Approach to investigation of anaemia in the elderly

The assessment of an elderly patient with anaemia should start with a thorough history and examination. This entails exploring severity of symptoms of anaemia, looking for a possible underlying cause, determining the functional status and frailty of the patient as well as the social background and support. A good history may reveal alarm symptoms such as melaena, weight loss, bone pains pointing towards a potential malignancy or a possible malabsorption or malnutrition problem. Examination is crucial to identify possibly haematological causes such as splenomegaly and also to detect any chronic problems such as chronic infections or autoimmune diseases.

Investigation of anaemia starts with a full blood count which includes a differential count, MCV and reticulocyte count. It is essential to check renal, liver and thyroid function tests and a haematinic screen – serum folate, serum vitamin B₁₂, ferritin and iron profile.

AI is characterized by a low serum iron and low iron-binding capacity associated with an elevated ferritin whilst IDA is indicated when the serum iron and transferrin saturation are low whilst the iron-binding capacity is high. Checking ferritin levels is only useful if the result is low because this effectively confirms IDA. Sometimes IDA and AI may coexist, complicating the interpretation of the iron studies. If there is microcytic anaemia without evidence of iron deficiency, this should prompt investigation for a haemoglobinopathy.

Depending on the results of these basic tests, further investigations may be useful, and these might include ultrasound of the abdomen and kidneys. In cases of nutritional anaemias, check for *Helicobacter pylori* and coeliac screen, whilst other patients may benefit from a full GI workup. Serum protein electrophoresis, serum calcium and x-rays looking for lytic lesions will help in the evaluation of multiple myeloma or other plasma cell dyscrasias. If the history is suggestive, one could consider an autoimmune screen or virology

tests (HIV and hepatitis screen). All cases of haemolysis have an increased unconjugated bilirubin, an increased reticulocyte count, increased lactate dehydrogenase levels whilst haptoglobin levels are decreased. A positive DAT is indicative of an autoimmune process for the haemolysis. In some instances, bone marrow studies may be indicated but many authors agree that because of the invasiveness of the tests, these are only undertaken if the life expectancy of the patient is expected to be more than three months (Stauder, Valent and Theurl, 2018; Alvarez-Payares et al., 2021).

4. Therapeutic options

Management of anaemia in the elderly is challenging. Many therapeutic options are available, but treatment has to be balanced with the clinical situation and frailty of the patient, the impact on quality of life and the side effects of treatment.

In cases of IDA, patients should be advised to consume more red meat, poultry and fish because these are excellent sources of heme iron. Heme iron is better absorbed than ferrous iron and is associated with fewer side effects. For therapeutic oral supplementation, many preparations with ferrous iron are available and are cheap, effective and safe. There are solid and liquid preparations with prolonged or quick release forms, with ferrous sulphate and ferrous gluconate being the most prescribed as both have excellent bioavailability. Treatment should be continued for at least three months after correction of anaemia. Oral iron treatment is often hampered by the frequent GI side effects which range from constipation, black hard stools, abdominal pain to nausea and vomiting. This may lead to noncompliance. Anti-acids may decrease iron absorption as do the tannins and polyphenols in tea and coffee (Andrès et al., 2012). Patients should be instructed to take oral iron with orange juice as Vitamin C improves absorption (Bianchi, 2016). Intravenous iron has the benefit that the total dose of iron needed can be calculated and replenished in a single or a few doses. It is safe but can be associated

with anaphylaxis and increased susceptibility to infections. It is the preferred treatment of iron replacement in patients with CKD, inflammatory bowel disease and the elderly with problems of malabsorption (Silay et al., 2015; Röhrig, 2016).

With regards to the other nutritional deficiency anaemias, folic acid and vitamin B₁₂ are prescribed as oral preparations. In patients with malabsorption, inflammatory bowel disease and pernicious anaemia, Vitamin B₁₂ can be administered as an intramuscular injection (Lanier, Park and Callahan, 2018).

Erythropoiesis-stimulating agents such as recombinant human EPO are typically used in patients with CKD but are increasingly used in MDS and few selected cases of unexplained anaemia (Goodnough and Schrier, 2014). EPO can exacerbate hypertension and, very rarely, worsen the anaemia by causing pure red cell aplasia. An aim for Hgb between 10 and 11.5g/dL is ideal as levels above 13g/dL have been associated with increased risk of stroke, thrombosis and cardiovascular events (Halawi, Moukhadder and Taher, 2017).

Blood transfusions are usually reserved for the immediate treatment of patients with severe, symptomatic anaemia or those who are critically ill. Decisions to transfuse should not be based solely on the Hgb level but also on symptoms and patient factors. The single-unit transfusion policy is suggested by Busti et al. (2019) and consists of transfusing one unit of red cells and then assessing the patient for improvement of anaemia symptoms and any complications. Adverse effects include transfusion-associated circulatory overload (TACO), transfusion-related acute lung injury (TRALI), iron buildup and increased risk of transmitting infections.

In cases of haemolysis, the treatment is directed towards identifying and treating any underlying cause. Steroids and rituximab are the mainstay of treatment in cases of warm AHA whilst rituximab and transfusions are applied in cold AHA. Management of AA may

consist of immunosuppressive treatment with a combination of ciclosporin and horse-derived antilymphocyte globulin or in the case of frail patients, single agent ciclosporin (Barcellini, Fattizzo and Cortelezzi, 2018).

Treatment of MDS consists mainly of supportive transfusions, iron-chelating agents and EPO injections (Halawi, Moukhadder and Taher, 2017). A small number of patients are found to have deletion of the 5q chromosome, and this is usually associated with good prognosis. These patients may benefit from oral thalidomide or lenalidomide. In other patients with MDS the hypomethylating agent azacytidine was found to improve quality of life. Only a few selected patients with an excellent performance status are considered for allogeneic stem cell transplantation (Gadó et al., 2022).

CONCLUSION

Despite being common, anaemia presenting in old age should not be disregarded as a normal consequence of aging. Investigation and management can be challenging especially if undertaken in the community. However, since many treatments are available, correcting the anaemia will improve the quality of life of elderly patients. Many drugs are still being investigated for the treatment of anaemia, particularly for myelodysplasia and anaemia of chronic disease. What is evident when reading the literature is the need for more research in this group of patients.

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Preparing an interdisciplinary guidance for the management of generalised paediatric status epilepticus

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ABSTRACT

Background

A guidance was created to assist family doctors in managing generalized paediatric status epilepticus (GPSE) at Primary HealthCare (PHC) clinics.

Aim

The article aims to discuss the process by which the GPSE guidance was prepared.

Objectives

The authors intend to provide information on how the literature review was carried out, what clinical threshold was decided as appropriate for the administration of rescue medication, and what treatments may be used in PHC.

Method

An initial search and guidance draft was forwarded to a Joint Working Group (JWG) composed of professionals working at PHC and Mater Dei Hospital (MDH). The names of benzodiazepines and their formulations available at PHC clinics were forwarded to the JWG by the clinical Chairperson of Primary HealthCare. A Pubmed search was carried out for the terms "status epilepticus," "children", and "prehospital", filtering for free full text publications, humans, English language, and dating from 1999 to

2019, yielding seventeen results in the English language. Eight were relevant. A second Pubmed search for "diazepam use in paediatric seizures" and "midazolam use in paediatric seizures" yielded fifty-five results, filtering for English and dating from 2010-2019. Two were relevant. Several guidelines and literature were directly referenced. The literature review process and results were summarised and modified into a flowchart.

Results

An interdisciplinary approach was used to decide how GPSE should be treated. Consensus was agreed that if a seizure lasts more than five minutes, benzodiazepines midazolam and diazepam available at PHC clinics, may be used. Intramuscular, intranasal, buccal, or rectal routes are preferred per the child's weight; and time the duration of seizure activity.

Conclusion

GPSE may terminate during the first five minutes of ictal activity. Midazolam and diazepam may be administered by different methods if seizures persist, depending on the clinical scenario.

Keywords

Family practice; status epilepticus; pediatrics; emergency medicine.

INTRODUCTION

Seizures occur as part of “an abnormal, unregulated electrical discharge within the brain’s cortical grey matter and transiently interrupts normal brain function” (Adamolekun, 2022). Paediatric Convulsive Status Epilepticus (PCSE) peaks neonatally, tailing off at five years of age, and commonly presents as the first seizure in childhood. A third of children are later diagnosed with epilepsy (Trinka et al., 2015).

Seizures tend to last less than five minutes, with prolonged episodes ranging from five to thirty minutes. Status epilepticus (SE) is conventionally defined as a seizure with persistent ictal activity lasting more than thirty minutes or a lack of recovery between two or more bouts. The International League against Epilepsy (ILAE) recommended treatment at the five-minute mark in cases of convulsive SE and ten minutes for non-convulsive SE since prolongation is more likely to incur significant morbidity and mortality (Trinka et al., 2015).

Aim

The authors aim to communicate how a guideline for the management of GPSE in Primary Healthcare Centres was prepared.

Objectives

The authors intend to provide the method by which the literature review concerning the management of PCSE was conducted, the clinical threshold at which rescue medication should be administered and the medications that may be administered in PHC clinics for GPSE.

METHOD

Two doctors training in family medicine and a specialist in family medicine conducted the initial search and guidance draft. A list of benzodiazepines, and respective formulations, were forwarded by Primary HealthCare administration (Table 1). A Pubmed search was carried out for full-text sources of manuscripts with relevant titles and abstracts. The national clinical practice guideline employed by the national health service was directly included (Mater Dei Hospital, 2016).

Table 1: Benzodiazepines available in Primary HealthCare centres

-
- Diazepam 10mg Injectable
 - Diazepam 2mg Tablets
 - Diazepam 5mg Tablets
 - Diazepam 5mg Rectal
 - Diazepam 10mg Rectal
 - Diazepam 10mg Injectable
 - Midazolam 10mg Injectable
-

The following sources were directly referenced:

- the definition of status epilepticus as delineated by the International League Against Epilepsy (ILAE) (Trinka et al., 2015),
- the National Institute for Health and Excellence (NICE) Pathway: treating prolonged or repeated seizures and status epilepticus (2022),
- the British National Formulary (BNF) (Joint Formulary Committee, 2020),
- the American Epilepsy Society: Convulsive Status Epilepticus Guideline (Glauser et al., 2016),
- Joint Royal Colleges Ambulance Liaison Committee (JRCALC) Clinical Guidelines (2019),
- European Medicines Agency (2022).

The draft was forwarded to a Joint Working

Group (JWG) composed of PHC and Mater Dei Hospital (MDH) professionals. The JWG included a specialist in family medicine qualified in emergency medicine, a paediatric specialist, a specialist in paediatric neurology, and a pharmacist qualified in clinical care.

RESULTS

An initial Pubmed search was carried out for the terms “status epilepticus,” “children”, and “prehospital”, yielding seventeen results in the English language. Eight were relevant.

A second Pubmed search for “diazepam use in paediatric seizures” and “midazolam use in paediatric seizures” yielded fifty-five results in English. Two were relevant. Several guidelines and literature were directly referenced (Table 2).

Table 2: Guidelines and literature directly referenced

-
- Drug Preparation and Administration in Neonatal and Paediatric Status Epilepticus (Agius et al., 2020)
 - British National Formulary (Joint Formulary Committee, 2020)
 - BMJ Best Practice (Hartman et al., 2020)
 - American Epilepsy Society Guideline (Glauser et al., 2016)
 - Holsti et al. (2010)
 - Humphries and Eiland (2013)
 - Joint Royal Colleges Ambulance Liaison Committee (JRCALC) Clinical Guidelines (2019)
 - Status epilepticus management (Mater Dei Hospital, 2016)
 - Epilepsies in children, young people and adults (NICE, 2022)
 - Intranasal Administration of Midazolam Treatment Guideline Sheet compiled by Primary HealthCare (Abela et al., 2011)
 - European Resuscitation Council Guidelines 2021: Paediatric Life Support Guidelines (Van de Voorde et al., 2021)
 - Zelcer and Goldman (2016)
-

The availability of several benzodiazepines in the primary healthcare clinics allowed the JWG to consider different approaches to treating GPSE (Table 1). The JWG reviewed the summary of the search and discussed the appropriate administration methods of benzodiazepines and the management of comorbid factors (see Table 3 and Appendix). The guidance was styled

into a flowchart and forwarded to two hundred thirty-two doctors and three hundred and twenty nurses working in PHC clinics via email for generic feedback (Figure 1). The background information collected in the initial review was also included in the feedback request. The replies were discussed amongst the JWG and included in the guidance.

Table 3: Benzodiazepines recommended, treatment thresholds and study conclusions (NB: IV - intravenous; IM - intramuscular; IN - intranasal; IO - intraosseus)

Geography	Source	Medicine, Dose, Route, Findings	Threshold of administration
National	Agius et al. (2020).	IV diazepam. IV lorazepam. If vascular access is not available: Rectal siazepam Buccal midazolam. Intramuscular IM midazolam. Intranasal IN midazolam.	Five minutes of seizure onset.
	Van de Voorde et al. (2021).	Benzodiazepine administration.	Five minutes of seizure onset.
	Hartman et al. (2022)	Rectal diazepam and buccal (dosing according to specialist guidance) or IN midazolam	Five minutes of clusters of seizure within gain of consciousness
European	Joint Royal Colleges Ambulance Liaison Committee (2019).	If IV or IO routes are unavailable, buccal midazolam or rectal diazepam.	After five minutes of seizure onset; After a second seizure occurring within ten minutes of the initial seizure of if lasts over five minutes from onset. A third dose may be given after twenty-five minutes.
	NICE (2022).	Midazolam 0.5 mg/kg buccally in a non-hospital setting or rectal diazepam if unavailable. IV Lorazepam is an option if resuscitation facilities are available.	Not available.
American	Glauser et al. (2016)	IV lorazepam and IV diazepam. Rectal diazepam, IM, buccal or IN midazolam are probably adequate.	Five minutes.

Geography	Source	Medicine, Dose, Route, Findings	Threshold of administration
	Furyk et al. (2017).	IV benzodiazepines. IM or IN if IV route not available.	
	Au et al. (2017).	Non-IV parenteral midazolam and rectal diazepam as first-line treatment.	
	Chin (2014).	Non-IV parenteral routes of midazolam, clonazepam, and diazepam.	
	Portela et al. (2015).	Midazolam via the IM route would provide a superior therapeutic effect than IV diazepam.	
Studies	Silbergleit et al. (2011).	IM midazolam was as safe and effective as IV lorazepam for seizure cessation in the prehospital setting. Irrespective of the route of administration, midazolam was a safe and effective rescue therapy.	Not available.
	Holsti et al. (2010).	IN midazolam group terminated attacks earlier than the rectal diazepam group. Both groups showed similar efficacy with fewer side effects when terminating seizure compared to cumbersome rectal diazepam.	
	Zelcer and Goldman (2016).	IN midazolam took longer to abort seizures when compared to IV diazepam following administration but took less time to abort an episode on arrival at the hospital, given the ease of administration.	
	Humphries and Eiland (2013).	Approval of IN midazolam.	
	Shah et al. (2014).	Non-IV parenteral routes if IV access was difficult.	

MANAGEMENT OF STATUS EPILEPTICUS IN CHILDREN

Primary HealthCare, 2021

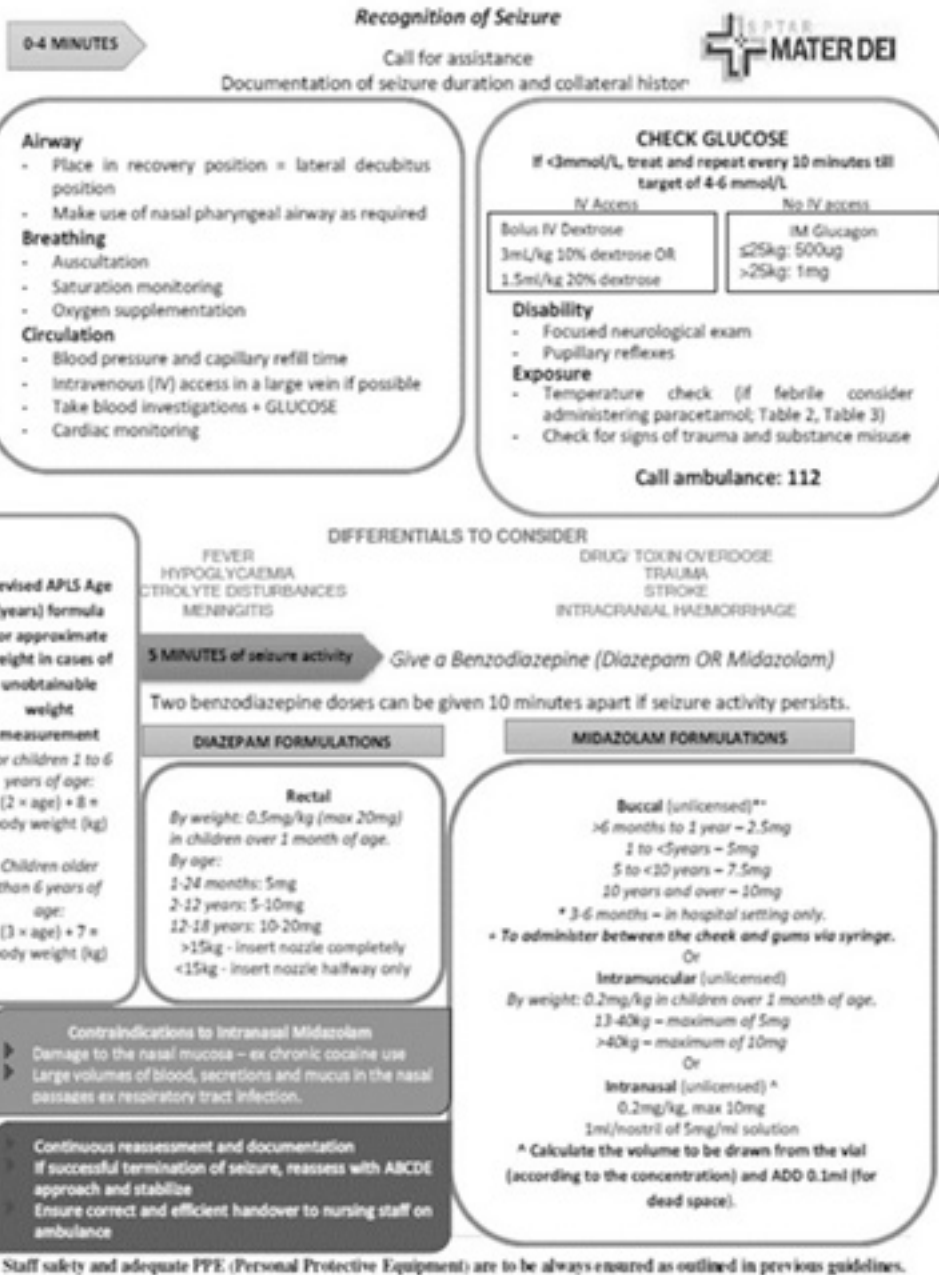


Figure 1: Flowchart delineating management of status epilepticus in children in Primary HealthCare clinics (Santucci, Baldacchino et al., 2021)

The JWG recommended that hypoglycaemia be highlighted earlier in the flowchart. The IV route of benzodiazepine administration was inadequate since resuscitation facilities might not be as readily available should severe respiratory depression develop. The flowchart guidance integrated the Updated Paediatric Life Support (APLS) formulae for approximate weight measurements based on age (Cattermole and

Manirafasha, 2021). Reversal of fever was not prioritised as it did not affect seizure outcomes and was omitted.

DISCUSSION

This review included professionals from secondary and primary care backgrounds. The concept framework in Figure 2 outlines the process of providing a clinical guideline managing GPSE.

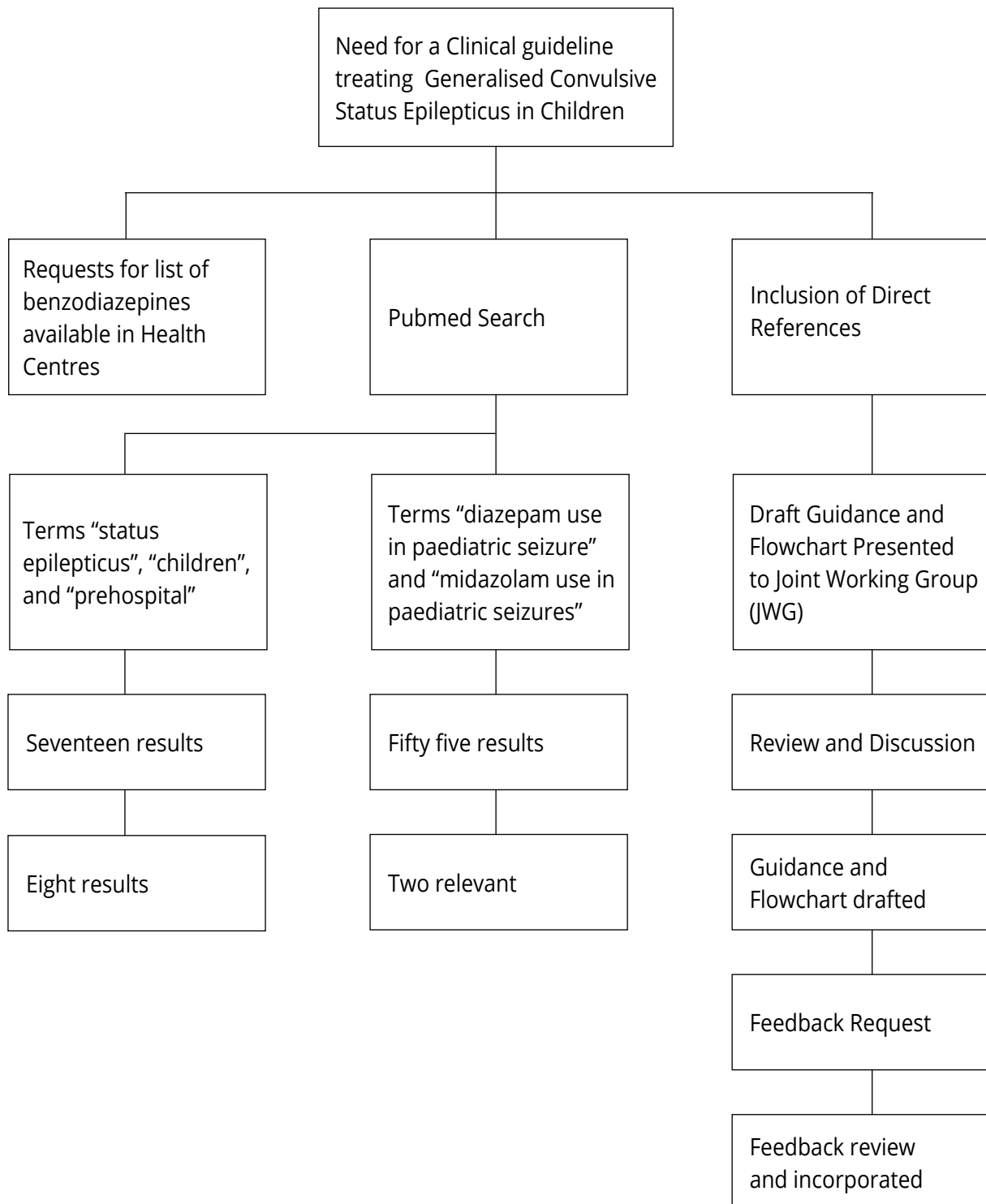


Figure 2: Conceptual framework of methodology

Several national, European and American guidelines addressed GCSE treatment. Oromucosal or IN midazolam, recommended in the national hospital guidance, are currently off-licence. This may change after the introduction of intranasal midazolam to the list of approved European medicines in 2022 (European Medicines Agency, 2022).

Pre-hospital seizure management in all the guidelines focuses on initial cardiopulmonary stabilisation and reversal of secondary causes, followed by benzodiazepine treatment at the five-minute threshold from seizure onset, or when recurrent episodes occur in a short span of time (Hartman et al., 2022, 2019; NICE, 2022; Van de Voorde et al., 2021) – see Figure 1.

CONCLUSION

The creation of a guidance for primary care physicians to treat GPSE involves an interdisciplinary approach involving paediatric neurologists, paediatric trainees, specialist and trainee family doctors, and feedback from professionals who will eventually implement its recommendations.

Healthcare providers may use the benzodiazepines midazolam and diazepam available at health centres to stop prolonged seizures.

When treating children, it is recommended to administer a single total dose using routes such as IM, IN, buccal, or rectal after five minutes of seizure duration. Dosage should be based on the child's weight, and the duration of seizure activity should be timed.

APPENDIX

National Guidance

Once seizure activity has been ongoing for 5-20 minutes and vascular access is obtained, the following drugs may be used as first-line:

- Intravenous (IV) diazepam.
- IV lorazepam.

If vascular access is not available, the following may be used instead:

- Rectal diazepam.
- Buccal midazolam.
- Intramuscular (IM) midazolam.
- Intranasal (IN) midazolam (Agius et al., 2020).

European Guidance

European Resuscitation Council Guidelines 2021: Paediatric Life Support Guidelines

SE presents with an overall mortality of 3%. Increasing evidence shows that early aggressive treatment is safe and associated with less morbidity and mortality. Spontaneous termination is unlikely at five minutes of seizure activity and is recommended as a treatment threshold. Benzodiazepines are the first-line treatment of choice; however, resources and clinical settings determine routes of administration. The guidance also outlines the management of seizures secondary to hypoglycaemic events and metabolic causes (Van de Voorde et al., 2021).

British National Formulary (BNF), 2020

Oromucosal midazolam solution is licensed for children older than three months, whilst IV and IM midazolam is not approved for use in status epilepticus in the paediatric cohort.

The formulary recommends administering diazepam intravenous solution as a slow IV injection over 3-5 minutes. Diazepam rectal tubes may also be used and are the preferred route of administration in neonates (Joint Formulary Committee, 2020).

British Medical Journal (BMJ) Best Practice, 2020

The BMJ recommends that minors be in recovery with a clear airway and administered treatment after 5 minutes of continuous seizure activity or when a cluster of seizures occurs without regaining consciousness. First-line options include rectal diazepam and buccal (dosing according to specialist guidance) or IN midazolam. Evidence suggests that midazolam is more effective in terminating seizures than diazepam (Hartman et al., 2022).

Joint Royal Colleges Ambulance Liaison Committee (JRCALC) Clinical Guidelines, 2019

Drug treatment should start after airway, breathing and circulation (ABC) resuscitation therapies occur while observing physiological endpoints. The JRCALC recommends rescue medication within five minutes of seizure onset as delays hamper effectivity.

Buccal midazolam or rectal diazepam are first-line agents for:

- i) seizures lasting more than five minutes,
- ii) another seizure lasting more than five minutes, or if it occurs within ten minutes of the end of the first seizure,
- iii) three or more seizures lasting less than five minutes but occurring within 1 hour or has not regained consciousness between each convulsion.

Previous domestic administration of anticonvulsants should not preclude treatment administration via other routes. If IV or intraosseous (IO) options are unavailable, buccal or rectal routes may be used.

After twenty-five minutes, a third dose may be given via IV/IO methods.

Children with epilepsy do not need hospital transfer if a convulsion follows the same rite of manifestation. Provision of secondary care is recommended for children:

- i) ≤ 2 years old,
- ii) with a first febrile convulsion,
- iii) receiving > 1 dose of anticonvulsant,
- iv) without full recovery.

The repeated rhythmic jerking of the limbs lessens after a tonic-clonic seizure and eventually stops. Post-ictal features mistaken for attacks include brief, irregular jerks of one or more limbs, eye deviation, nystagmus, or noisy breathing. (Joint Royal Colleges Ambulance Liaison Committee, 2019)

National Institute for Health and Care Excellence (NICE), 2022 (Reviewed 2022)

NICE guidelines recommend that parents, guardians, or ambulance crew of paediatric patients administer midazolam 0.5 mg/kg buccally in a non-hospital setting or rectal diazepam if unavailable. IV lorazepam is an option if resuscitation facilities are available (NICE, 2022).

American Guidance

American Epilepsy Society Guideline, 2016

The American Epilepsy Society Guidelines support IV lorazepam and IV diazepam when aborting seizures lasting at least 5 minutes. The guidance noted rectal diazepam, IM, buccal or IN midazolam as probably adequate. It did not support IV lorazepam over IV diazepam. Sublingual lorazepam was less effective than rectal diazepam. IN, IM, or buccal midazolam-controlled seizures were terminated earlier than IV diazepam when the time to establish IV access was included. Initial therapy as a single rescue dose was preferred.

Respiratory depression was the most significant side effect of anticonvulsant treatment. There was no substantial difference in the rate of respiratory depression when comparing midazolam, lorazepam or diazepam delivered via different routes. Child cohorts reported fewer benzodiazepine-related adverse effects than adult groups (Glauser et al., 2016).

Studies

A narrative review conducted by Furyk et al. (2017) reflected the evidence for Australasian pre-hospital SE protocols in children. The study used the contemporary definition of SE as a seizure with a duration of more than 5 minutes, and basic resuscitation requirements were prioritised in a stepwise approach. Two doses of benzodiazepines were first line, preferably given by IV access; otherwise, the IM/IN routes would be indicated. The rectal route was considered socially unacceptable.

Au et al. (2017) systematically reviewed thirteen articles addressing the variance in pre-hospital national or regional guidelines on managing status epilepticus in the paediatric population. Pubmed and Google Scholar databases were searched against keywords in the English language. Manuscripts that fulfilled the author's criteria were considered via the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) 2009 Group statement (Moher et al., 2009). Guidelines (n=6) recommended non-IV parenteral midazolam and rectal diazepam (n=5) as first-line treatment.

Chin (2014) addresses the best method of delivering benzodiazepine therapy to children with GPCSE. By referencing pharmacological experiments on stability, absorption and *in vivo* studies, Chin concludes that non-IV parenteral routes of midazolam, clonazepam and lorazepam appreciate practicality and efficiency. Chin referenced research by Lahat et al. (2000) of 47 patients treated for febrile seizures and compared it with another study that included 70 patients suffering from febrile and afebrile seizures conducted by Mahmoudian and Zadeh (2004). From both these randomised controlled trials (RCTs), Chin determined that although nasal midazolam would not be considered in a young febrile child with small nares and rhinitis, it appeared to work. Chin also remarked that although the buccal route may theoretically lead to aspiration in semi-conscious patients, this was never reported in 600 children administered buccal midazolam in four studies comparing outcomes with rectal diazepam (Ashrafi et al., 2010; McIntyre et al., 2005; Mpimbaza et al., 2008; Scott et al., 1999). In all four studies, rectal diazepam was inferior in terminating seizures within five minutes of administration (Chin, 2014).

Portela et al. (2015) conducted a randomised controlled trial that accepted 36 patients at a paediatric emergency department in Brazil. They aimed to compare the therapeutic efficacy of IM midazolam against IV diazepam. It was concluded that giving midazolam via the IM route would provide a superior therapeutic effect since it was easier to administer and was well absorbed (time from admission to active treatment (min) 2.8 ± 1.5 IM midazolam vs 7.4 ± 4.1 IV diazepam, $p=0.001$).

The Rapid Anticonvulsant Medication Prior to Arrival Trial (RAMPART) is an American double-blind, randomised, non-inferiority clinical trial comparing IM midazolam to IV lorazepam. RAMPART aimed to witness the outcomes of seizure abortive treatments before arrival at the emergency department after a first dose. IM midazolam was “blinded” with IV or IM placebo, respectively, in 445 patients per treatment group. IM midazolam was as safe and effective as IV lorazepam for seizure cessation in the

prehospital setting. Irrespective of the route of administration, midazolam was a safe and effective rescue therapy (Silbergleit et al., 2011).

Holsti et al. (2010) aimed to compare IN midazolam and rectal diazepam when used by carers. They followed up with families after prescribing IN midazolam with a mucosal atomisation device. The IN midazolam group terminated attacks earlier. Both groups showed similar efficacy with fewer side effects when terminating seizures compared to cumbersome rectal diazepam.

Zelcer and Goldman (2016) studied whether there were alternative non-IV methods for seizure cessation in children. In a short review comparing several studies, they concluded that IN midazolam took longer to abort seizures when compared to IV diazepam following administration but took less time to abort an episode on arrival at the hospital, given the ease of administration.

Humphries and Eiland (2013) compare the delivery modes for rectal diazepam and IN midazolam. They addressed cost, pharmacokinetics, time to seizure cessation, ease of use, and safety. Retrospective studies were reviewed, and the authors went further than the initial research question. The manuscript concluded with an overall approval of IN midazolam regarding safety, practicality, efficacy, and cost.

Osborne’s narrative review in 2014 oversaw the pre-hospital care following a seizure in the United Kingdom. The MEDLINE database search, supplemented by hand searches, addressed 50 clinical guidelines and studies. The manuscripts that studied benzodiazepine administration included cross-over studies ($n=1$), randomised control trials ($n=7$), retrospective reviews ($n=7$), and prospective observational studies ($n=2$) (Osborne et al., 2015).

Shah et al.’s study was based on an initial literature review carried out in 2009 and updated in 2012. Several experts from multidisciplinary areas participated in the data gathering. The panel had the input of an evidence-based medicine specialist trade in the constituents in the GRADE method of interpretation. This was followed by a PICO (patient, information,

comparison, outcome) format of evidence retrieval and recommendations. Most of the GRADE evidence quality in this study was low, given few high-quality studies. The panel strongly recommended early seizure treatment and preferred alternative non-IV parenteral routes

if IV access was difficult. The lack of neurologist and parent perspectives limited the study. The delay in feedback from Federal sources also resulted in the need to update the literature. The impact on patients and the health systems was not assessed (Shah et al., 2014).

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Updates in the prevention of fractures

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ABSTRACT

Background

The prevention of fractures is multifaceted and relies on reorienting lifestyles and targeting persons with increased fracture risk. Following an earlier review in 2017, the International Osteoporosis Foundation (IOF) has provided several updates for fracture prevention.

Objectives

This bibliographic review will provide family doctors with the IOF's updates published on its website, noting changes to treatments and guidelines, addressing the prevention of fractures and discussing the new recommendations in the context of the Maltese healthcare system.

Method

The IOF website (<https://www.osteoporosis.foundation/>) was reviewed for guidance on preventing fractures from the 19th to the 27th of February 2023. The Scottish Intercollegiate Guidelines Network SIGN 2021 guidelines on managing osteoporosis and the UK Steady, Strong, Straight consensus statement were included. Updates in fracture prevention management were noted, and domestic practices and services available in the community were discussed.

Results

The IOF promotes bone health through educational means, lobbying, and developing strategies, such as the Scorecard for Osteoporosis in Europe (SCOPE), which compares EU countries

based on expenditure outcomes and accessibility to fracture prevention and management services. The review also emphasises using fracture risk calculators and densitometry to determine treatment and measure responses.

Conclusion

Strategies can reduce the risk of fractures by giving specific, measurable, and doable objectives to different stakeholders. For family doctors, this could involve community services in assessing the domestic milieu and improving access to social benefits and interventions. Home improvement measures improve both the risk and rate of falls while intervening on a personal level by improving physical and mental attributes to improve the rates of falls.

Keywords

Osteoporosis; fractures, bone; family practice; Malta

INTRODUCTION

The prevention of fractures remains multifaceted and relies on individually tailored practices by reorienting lifestyles and targeting persons with increased fracture risk. Following an earlier review in 2017 (Baldacchino and Baldacchino, 2017), the International Osteoporosis Foundation (IOF) has noted several updates in fracture prevention relevant to specialists in family medicine (International Osteoporosis Foundation, 2022).

This review will provide family doctors with the updates noted by the IOF on its website and secondary references provided. Its goals include:

- A review of the new treatments and guidelines.
- Addressing the prevention of fractures.
- To discuss the new recommendations in the context of the Maltese healthcare system.

METHOD

The IOF website (<https://www.osteoporosis.foundation/>) was reviewed for guidance on preventing fractures from the 19th to the 27th of February, 2023. The SIGN 2021 guidelines on managing osteoporosis and the UK Steady, Strong, Straight consensus statement were included (Shlisky, et al., 2021; Brooke-Wavell, et al., 2022).

Updates in fracture prevention management from the guidance provided by the IOF website and secondary references were noted, and domestic practices and services available in the community were subsequently discussed.

RESULTS

A summary of the key findings was drawn up in Table 1. The IOF promotes bone health through educational means, lobbying and devising strategies. Through multicentre collaboration, the IOF has developed the “scorecard for osteoporosis in Europe” (SCOPE), summarising expenditure outcomes and accessibility to fracture prevention and management services. The scorecard is relativistic in that it compares EU countries; there is no agreed range on what constitutes a high or low risk. Malta’s score shows good access to Dual X-ray Absorptiometry (DXA) scanning. Its population is generally in the middle range of FRAX (Fracture Risk Assessment Tool) risk and social policy interventions aimed at fracture prevention. Age-based prediction models place the Maltese population on the high end of future fracture projections (an increase of 47.7% by 2034). In 2019, this cost an average of 60 euros per person (Kanis, et al., 2021).

Table 1: Summary of key recommendations

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- Malta is in the middle range of FRAX (Fracture Risk Assessment Tool) risk for Europe.
 - Incidence of fractures is projected to increase by almost 50% by 2034.
 - Social workers are invaluable in assisting with the domiciliary setting.
 - Caucasians are at higher risk of fracture.
 - Vertebral fractures are not very symptomatic.
 - Home interventions improve fall rates and risk.
 - Medical interventions improve the rate of falls, not risk.
 - Vitamin D does not reduce fall rate or risk.
 - Thiazolidinediones increase urinary calcium excretion.
 - Vitamin D is recommended for persons taking anti-epileptics.
 - Fracture risk determines treatment.
 - Treatment is advised for the very high risk, and high risk.
 - Vitamin D and calcium intake should be considered for all at-risk groups.
 - Anabolic agents are first-line followed by an inhibitor of bone resorption for very high-risk groups.
 - High-risk groups can be offered oral bisphosphonates or bone resorption inhibitors.
 - Risedronate has more beneficial bone density outcomes than alendronate in men.
 - Teriparatide and zoledronic acid are recommended as first-line for spinal fractures.
 - Bone density measurements at three-year intervals after treatment started.
 - “Strong, Steady, Straight” exercises are recommended.
 - The very high risk, or cases with T-scores < -3.5, or vertebral fractures should be referred to secondary care.
 - Falls clinic referrals for those with > 1 fall in the previous year.
-

Ethnic variations in fracture probabilities showed that Caucasians were at the highest risk of hip fractures, followed by the Indian population, coloured persons and black persons. Black persons had a four-fold lower probability of developing a hip fracture than their Caucasian counterparts. It was theorised that a biological advantage existed for Caucasians to require less calcium in their diet. At the same time, black persons had a greater capacity to absorb calcium and form thinner, denser bones (Kanis, et al., 2019; Shlisky, et al., 2022).

Gender-specific variations yield different frequencies of certain fractures. Men have been demonstrated to present with radiographic vertebral fractures more often at 55 to 59 years of age, while hip and wrist fractures are somewhat absent until the eighth decade. Women tend to have an exponential increase in the risk of radiographic vertebral fractures from 55 years of age, followed by a rise in the probability of wrist fractures at 80 (Sambrook and Cooper, 2006). Vertebral fractures in both groups tend to be less symptomatic, with a third exhibiting symptoms and 10% requiring hospitalisation for pain management (Lems, et al., 2017).

Diet and lifestyle

A Cochrane review in 2018 assessed how effective interventions were in preventing falls. Intervening in different areas reduced the rate of falls (relative risk (RR)=0.76; confidence interval (CI): 0.67-0.86) but not the risk of falling (RR=0.93; CI: 0.86-1.02). Vitamin D did not reduce the fall rate (RR=1.00; CI: 0.90-1.11) or the risk of falling (RR=0.96; CI: 0.89-1.03). The rate of falls (RR=0.81; CI 0.68-0.97) and risk of falling (RR=0.88; CI=0.80-0.96) were bettered by improving the home environment (Hopewell, et al., 2018).

The other dietary and lifestyle risk factors for osteoporosis included diabetes, obesity, proton pump inhibitors, anti-depressants, anti-epileptics, aluminium antacids and high salt intake. The introduction of thiazolidinediones (TZDs) in diabetes and their propensity to increase fracture risk by urinary calcium excretion was highlighted in the European guidance on the prevention of fractures. Vitamin D supplementation remains recommended for persons on anti-epileptic

treatment. So far, vitamin D supplementation has not shown an effect on cardiovascular status, and neither have treatment changes by family doctors to improve the risk of falls (Kanis, et al., 2019).

Fracture risk

Fracture risk calculators remain the mainstay for considering interventions in osteoporosis and fracture prevention. Fracture risk estimation methods remain prone to underestimating other clinical observations such as increased risks of falls, the type of previous fracture and the number, higher doses of steroid therapy and the risk of atypical femoral fractures. The new guidance also calls for considering a possible spinal fracture if a four-centimetre decrease in height is observed (Lems, et al., 2017).

DXA scans play a role in assessing responses to treatment at the care provider's discretion. Kanis, et al. (2019) commented on the treatment thresholds of 20% 10-year probability of a major osteoporotic fracture and 3% 10-year probability for a hip fracture that certain countries employed. The *raison d'être* for this observation was that the United States National Osteoporosis Foundation used these cut-offs as a cost-benefit strategy. The recommended approach was to treat those at very high risk of fracture and those considered high risk when densitometry was provided to intermediate-risk cases. The authors pointed out that a DXA scan was not indicated in very high-risk scenarios since a 20% gap in fracture probability would be present and would not significantly change management.

Treatment updates

The European group recommended that calcium and vitamin D status be addressed for all risk groups. In very high-risk groups, anabolic agents are considered the first line, followed by an inhibitor of bone resorption. In high-risk persons, oral bisphosphonates or bone resorption inhibitors may be considered (Kanis, et al., 2019). First-line oral bisphosphonate treatment for men now shifts to a "may consider" position by SIGN to risedronate over alendronate following a more beneficial effect on bone density outcomes and little benefit noted on fracture risk outcomes.

At the same time, zoledronic acid was given a “should consider” role in male osteoporosis (Shlisky, et al., 2021).

The European guideline group recommended teriparatide or zoledronic acid for persons with a spinal fracture as first-line alternatives. Duration of treatment also varies, with risedronate recommended for a total of seven years, zoledronic acid for three years, denosumab for five to ten years, and teriparatide recommended for a maximum of two years. Treatment response assessment by DXA scan for inpatient comparison of lumbar spine density was recommended after a minimum of three years (Lems, et al., 2017).

Treatment with a bisphosphonate following teriparatide, denosumab, and romosozumab (a monoclonal antibody directed at osteoclastin) is recommended since benefits from anabolic agents are short-lived compared to bone resorption inhibitors (Lems, et al., 2017).

Exercise

The UK consensus statement on physical activity and exercise for osteoporosis recommends three varieties of exercise prescription for persons with osteoporosis:

- For persons prone to falls, the “steady” programme recommends strengthening muscle, gait and balance skills.
- In persons with vertebral fractures and back pain, the “straight” programme strengthens back musculature to improve kyphotic posturing. Practical advice on how to load the spine is also given.
- For persons who do not have spinal and mobility difficulties, muscle strengthening and impact exercises for bone strength are carried out (Brooke-Wavell, et al., 2022).

Referral

The National Osteoporosis Guideline Group (2021) in the UK recommends referral to secondary care in five scenarios:

- Those persons at very high risk.
- Those who suffered multiple fragility fractures.
- In cases with a very low T-score finding (<-3.5).
- The presence of recent or multiple vertebral fractures.
- In persons with multiple risk factors.

Fracture liaison services

The IOF also advocates using fracture liaison services (FLS) to provide better care to persons with post-fragility fractures. FLS have been observed to decrease institutional referrals, hospital bed stays, and the need to go to clinics. An FLS coordinator receives the notification of a fracture in persons over 50 years, having a spinal fracture, or suffering a fracture while on treatment for osteoporosis. The coordinator investigates the cause of the fracture by assessing a person’s health and risk of falls by 12 weeks. They liaise with community and secondary care services to deliver fracture risk and fall risk assessments. Patients and their carers are educated, treatment is offered, and follow-ups are carried out at 16 and 52 weeks. FLS services also meet with other professionals to discuss strategies and improve the service (Gallacher, et al., 2019).

DISCUSSION

The IOF's vertical approach to preventing fractures involves a strategy for European countries to coordinate efforts at a domestic level. This means that the ethnographic needs of patients that Maltese family doctors face daily must be considered when interpreting the SCOPE scorecard (Kanis, et al., 2021).

By 2034, Malta expects an almost 50% increase in osteoporotic fractures (4,700 incidental fractures), emphasising the need to invest in education, auditing, prevention, and treatment services. In 2016, almost half of patients sustaining low-energy hip fractures were on calcium and vitamin D supplementation, but only 2.64% were on antiresorptive therapy (International Osteoporosis Foundation, 2022).

Unfortunately, strategic post-operative community care of hip fractures and fragility fracture capture remains elusive. These events provide family doctors with a surrogate marker of osteoporosis status and may allow family doctors to make a difference after patients are discharged from rehabilitation services.

The emerging role of TZDs is also receiving attention from the Maltese medical community and has found its way into the government outpatient formulary list along with combined vitamin D – calcium preparations (Directorate for Pharmaceutical Affairs, 2023). This availability presents an increasing requirement for dietary calcium in patients taking TZDs.

Spinal fractures and very low T-scores (<-3.5) have attracted anabolic therapies and zoledronic acid as first-line measures by the IOF. The drawback to using teriparatide and denosumab is that their effects last a few years, and this initial phase might have to be governed by secondary care. The changeover to a bisphosphonate afterwards retains the improvement in bone density (Kanis, et al., 2021).

The national health service Primary HealthCare physiotherapy clinics around the islands also provide falls-assessment clinics that assist in exercises that prevent falls and how to manage falls and get up. They also offer vestibular rehabilitation exercises. This follows the advice given by the “Strong, Steady, and Straight” recommendations (Brooke-Wavell, et al., 2022).

Patients with complex conditions, such as Parkinson's, are directed to specialised services for a comprehensive evaluation. Falls clinic interventions are still recommended for those who have fallen more than once in the previous year. This translates into multidisciplinary involvement of occupational therapists, physiotherapists, geriatric services, sports clinics, orthopaedic inputs and other disciplines (National Osteoporosis Guideline Group, 2021).

Family doctors, however, retain their role as specialists in their patients' lives. Following a fracture, one may have significant changes in one's life and identity. Social workers are invaluable in such cases and must be engaged by family doctors to ameliorate domiciliary living conditions.

Limitations

The national scenario remains unexamined with no official data on how many patients receive antiresorptive therapy and dietary supplementation for osteoporosis.

This research only focuses on the recommendations of the IOF. Readers may consider other sources of information on public policy and medicine concerning osteoporosis.

Each patient scenario has its own clinical details that make a difference on how treatment is managed. Other professionals, such as social workers, intervene with different targets according to their professional competencies and the patient's needs.

CONCLUSION

The IOF recommended implementing strategies to reduce the risk of fractures by giving stakeholders specific, measurable, and doable objectives emphasising dietary, pharmacological, and domiciliary interventions.

Bisphosphonates are recommended as a follow-up therapy to the improvements in densitometry gained by anabolic agents recommended for very high-risk individuals.

Domestic interventions improve the risk and rate of falls while intervening personally by improving physical and mental attributes to

prevent falls. As stewards of their patient's health, Maltese family doctors should be educated on what community services they can avail themselves of to assess and intervene in patients' domestic milieu and improve access to social benefits and interventions.

A strategy would be needed to handle efficiently the multiple stakeholders involved. It may incorporate a FLS that can follow cases earlier and prevent complications. Such a strategy would include an audit system that picks up outcomes and establishes a feedback cycle for self-improvement with stakeholders.

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