

Primary pyomyositis: Its socioeconomic effects; a Community overview. A qualitative study design

ABSTRACT

Aims: To assess the community's views on the socioeconomic effects of primary pyomyositis to the patients, family, health facilities and community.

Study design: A cross-sectional study design using qualitative research methods

Place and Duration of Study: Gulu Regional Referral Hospital in Northern Uganda from September 2011 to November 2013.

Methodology: The study was conducted among patients with primary pyomyositis, next of kin, health workers and opinion leaders on their views about the socioeconomic effects of pyomyositis to their community. Key Informant Interviews, Focus Group Discussion and In-depth Interviews were used to obtain qualitative information. Ethical approval for the study was obtained from Gulu University IRB and the National Council of Science and Technology (UNCS&T). Thematic content analysis was used to analyze this qualitative data.

Results: Primary pyomyositis has several socioeconomic effects to patients, family, health facilities and communities. The effects of the disease ranges from the disability it creates to inability to earn a living deepening the economic status/crisis of individuals, families and communities. It creates series of social problems that make local leaders become less useful to their communities and also sets-in marriage related social problems. Education of the school going children are usually affected leading to school dropout.

Conclusion: There is a wide range of socio-economic effects of primary pyomyositis to the population of Northern Uganda and it is presented with a number of socioeconomic effects similar to those chronic diseases such as HIV/AIDS.

Keywords: Primary pyomyositis, socioeconomic effects, Gulu, Northern Uganda.

1. INTRODUCTION

Pyomyositis is a suppurative inflammation of large truncal and lower limb muscles and it is mainly caused by *Staphylococcus aureus* [1]. This infection is increasingly common in non-tropical regions but it is highly prevalent in tropical regions [2]. Many cases of pyomyositis have been reported in patients with immunosuppression including HIV/AIDS since 1987 [3]. Reports from Northern Uganda indicate that pyomyositis is a very common disease especially in the second and third decades of life and it is a major cause of severe disability, morbidity and contributes significantly to the delay hospital stay [4]. Therefore, such diseases are a threat to social and economic development in developing countries and can lead to poverty, affecting particularly young people in their most productive age [5]. It weakens family and societal support systems, decreases participation in formal education of young people, along with depleted family income due to loss of

23 work, and poor disease management thus presenting more additional vulnerabilities to families,
24 patients and communities [5]. Pyomyositis is a threat to social and economic development and it
25 can lead to poverty, affecting particularly men, women and young people in their most productive
26 ages [5]. Several researchers have proposed that effective prevention and care in enabling
27 environments can only help those with chronic diseases e.g. pyomyositis to overcome their
28 devastating outcomes [5]. It is suggested that by an appropriate response to support those affected
29 by chronic disease and other related conditions, everyone gains and no one losses [6]. Families'
30 gain as the income from work will continue, children gain as they continue to receive support from
31 their families and in this way people living with chronic diseases remain productive for longer and
32 the state and communities gain because production is not disrupted in key sectors such as
33 education, agriculture, farming and public service duties [6].

34 Socioeconomic status (SES) and effects are often measured as a combination of education,
35 income and occupation and it is commonly conceptualized as the social standing or class of an
36 individual or group [6,7]. Socioeconomic status is typically broken into three categories; high,
37 middle, and low SES to describe the three areas a family or an individual may fall into [6,7]. So
38 when placing a family or individual into one of these categories any or all of the three variables
39 (income, education, and occupation) can be assessed. Additionally, low income and little
40 education have shown to be strong predictors of a range of physical and mental health problems,
41 ranging from illnesses of the respiratory system, arthritis, coronary disease, and schizophrenia
42 [6,7]. These may be due to environmental conditions in their workplace, or in the case of mental
43 illnesses, may be the entire cause of that person's social predicament [6,7]. Pyomyositis often have
44 a negative impact on socioeconomic status of a person by constraining an individual's ability to
45 work and earn income [7].

46 A previous research has indicated that up to 45% of people living with HIV for example are
47 unemployed [8] and the effects of this chronic disease on the physical and mental functioning can
48 make maintaining regular employment difficult [8]. Patients with chronic diseases such as
49 pyomyositis infection may also find that their work responsibilities compete with their health care

50 needs [8]. Furthermore, individuals affected with chronic diseases are often discriminated against
51 in their workplaces, leading to their termination of services or forced resignation [9,10]. Children
52 infected with HIV/AIDS and pyomyositis for example may often exhibit cognitive deficits when
53 compared with their uninfected peers [11]. These deficits have been found to adversely affect
54 learning and earning ability later in life [11].

55 Against this background, the present study was undertaken to assess the socioeconomic effects of
56 primary pyomyositis to the patients, family, communities and health facilities.

57 58 **2. PATIENTS AND METHODS**

59 **2.1 Study setting**

60 This study was conducted in Gulu, Kitgum, Pader and Agago districts in Northern Uganda from
61 September 2011 to November 2013. The centres where this research on pyomyositis patients was
62 conducted were: Gulu Regional Hospital, Lacor Hospital, Kitgum Government Hospital, Kitgum St.
63 Joseph's Hospital and Kalongo Hospital which are situated in the above districts. This region where
64 the study was conducted is just recovering from over 20 years of civil war between the Government
65 of Uganda and Lord's Resistance Army (LRA). The population of these districts are largely rural;
66 many of whom were displaced into camps infamously known as the internally displaced peoples
67 camps (IDPS) for over 10 to 12 years for safety from insurgency. It is estimated that over two
68 million persons in this region were displaced into IDP camps from 1996 to 2008 where they were
69 being fed nearly exclusively on food provided by the United Nations World Food Programs
70 (UNWFP). Reports from world food program indicated that they provided only 60% of the required
71 calories of food per person per day. The community had no other options of obtaining food since
72 their farmland were inaccessible due to the insecurity and ordinances planted on their land during
73 the war. According to the Gulu, Kitgum, Pader and Agago district development plans 2009/2010,
74 the 4 districts have a total population of about 1,200,000 people [12].

75

76 **2.2 Study Design**

77 We conducted a cross-sectional study design using qualitative research methods: Six Focus Group
78 Discussions (2 with male pyomyositis patients, 2 with female patients and 2 with the next of kin);
79 Four In-depth Interviews with pyomyositis patients who were: A teacher, a Local Council Chairman
80 1 (LC1), an elderly female and a young female patient.
81 Eight Key Informant Interviews were conducted with health workers: Medical
82 superintendents/Hospital Directors, Surgeons, Matrons, In-charge of surgical ward, theatre nurse,
83 next of kin, supplies officer, and medical officers of the health facility.

84 **2.3 Selection of study participants**

85 We consecutively recruited pyomyositis patients undergoing treatment and rehabilitation at these
86 Hospitals in Northern Uganda for Focus Group Discussion however patients for the in-depth
87 interviews were selected purposively. Key informant interviews were conducted with health workers
88 who were involved in the medical and surgical management of pyomyositis patients. Pyomyositis
89 were independently diagnosed by the Principal Investigator and his research team using an
90 approved proforma designed for the recruitment and management of these patients. Those
91 patients that did not consent to the study were excluded.

92 **2.4 Data Collection methods**

93 **2.4.1 Key informant interviews (KIIs):** Eight key informant interviews were conducted with the
94 Health workers of these Hospitals where the researches were conducted: The staffs interviewed
95 included the Medical Superintendents/Hospital Directors, surgeons, matrons, in-charge of surgical
96 ward, theatre nurse, next of kin, supplies officer, and medical officers of the health facility who were
97 mainly involved in the medical and surgical management of these pyomyositis patients. Key
98 informant interviews were guided by the KII guide and these were administered by the Principal
99 Investigator and were assisted by his research assistants. Each key informant interview session
100 lasted between 60 to 90 minutes and was only completed when the issues to be discussed were
101 exhausted.

102 **2.4.2 Focus Group Discussions (FGDs):** Six focus group discussions were conducted with the
103 patients and the attendants; two groups were with the male patients; additional 2 groups with the
104 female patients and the last 2 groups with their next of kin. Each discussion group comprised of 8-
105 10 participants who were selected to be relatively homogenous in terms of age and level of
106 education to facilitate free participation among members. The FGDs was guided by a focus group
107 discussion guide, and this was moderated by the Principal Investigator. During the discussions, the
108 proceedings were recorded in a note book and summarized in themes which were designed for the
109 recruitment and management of these participants. Because the majority of the patients and next
110 of kin were mainly from Acholi tribe which speaks Luo; both Luo and English languages were used
111 during the discussion to aid free discussions among participants. Each FGD session lasted
112 between 60 to 90 minutes on average. Cordial working environment was observed until most of the
113 important issues were exhaustively discussed.

114 **2.4.3 In-Depth Interviews (IDIs):** Four in-depth interviews were conducted with 4 patients who
115 were purposively selected because of the special and in-depth information they had about the
116 disease and the massive influence they had on their peers and community. These patients that
117 were selected included: a primary school teacher, a Chairman Local Council one (LC1), one elderly
118 woman and one young girl.

119 The In-depth interviews were guided using the IDI guide which were developed during the
120 recruitment and management of pyomyositis patients and were administered by the Principal
121 Investigator assisted by his research assistants. Each session of the interview lasted between 60 to
122 90 minutes and was completed when all the issues raised were discussed exhaustively.

123 **2.5 Data Analysis**

124 The Principal Investigator and his research assistants collected the data which were triangulated
125 and transcribed into electronic text and summarized into key themes that were selected before and
126 during the data collection and analysis process (thematic content analysis).

127

128

129 **2.6 Ethical Approval**

130 The study was approved by the Institutional Review Committee (IRC) of Gulu University Medical
131 School GU/IRC/02/01/11 and Uganda National Council of Science and Technology (UNCS&T) HS
132 922. Informed consent and Assent was obtained from each individual patient or next of kin in the
133 presence of their parents/guardians. Confidentiality of information from individual person was
134 protected for all the participants of this research.

135 136 **3. RESULTS AND DISCUSSION**

137 **3.1 Socioeconomic effects of diseases**

138 The economic burden of diseases on a person or population can be assessed by adding the direct
139 costs of expenditure on prevention and treatment with the indirect costs of productive labour time
140 lost because of morbidity and mortality [13]. Costs can be assessed at the micro-level to provide
141 insight into the effects on individual households and businesses, and at the macro-level, to show
142 the effects on the economic performance of a nation [13]. For instance, the financial and economic
143 costs of treatment and control of neglected tropical diseases are often considered from the
144 perspective of the health-care provider, most notably the costs faced by government-funded health
145 facilities [13]. Individuals and families have heavy out-of-pocket (direct) costs when seeking care
146 for treatment for these diseases [13].

147 In Ghana for example, the cost of care per patient with Buruli ulcer in a household in the poorest
148 earning quartile was reported as 242% (193-315%) of their annual earnings, which can be
149 regarded as catastrophic [14]. By contrast, in a household in the richest earning quartile the cost
150 per patient was reported as 94% (89-105%) of their annual earnings [14]. This shows that although
151 the economic effect on both income groups is catastrophic, this difference indicates inequity, since
152 treatment costs disproportionately affect the incomes of the lowest-income households [14,15].

153 A study in Sri Lanka [16] reported how the poorest patients with lymphatic filariasis were driven into
154 the medical poverty trap, and how they delayed accessing the health-care system, thereby allowing
155 the symptoms to progress and making treatment difficult or impossible [16]. Studies in Thailand

156 and South Vietnam found that an average family pays US\$74 and \$67 respectively, to treat a child
157 with dengue haemorrhagic fever, which was more than an average monthly salary at the time when
158 the studies were done [17,18]. The indirect costs to people affected by neglected tropical diseases
159 and their carers, and the economic effect on a household for example, further compounds the costs
160 [19].

161 It is therefore important to note that measuring morbidity and mortality are key considerations for
162 estimating the burden of diseases in populations [20] however, focusing only on morbidity and
163 mortality effects provides an incomplete picture of the adverse impact of ill health on human
164 welfare and in particular, the economic consequences of poor health can be substantial [20].
165 Health 'shocks'—such as unexpected increases in health expenditure, reduced functional capacity
166 and lost income or productivity—are often a primary risk factor for impoverishment [21,22]. Poor
167 levels of health may also adversely impact educational attainment and consequent levels of future
168 income [22]. This has been observed with patients affected by primary pyomyositis in this region of
169 Uganda.

170 At a societal level, poor population health is associated with lower savings rates, lower rates of
171 return on capital, and lower levels of domestic and foreign investment; all of these factors can and
172 do contribute to reductions in economic growth [23]. So, measurement of these various adverse
173 impacts provides decision-makers with an indication of the extent to which a specific disease or,
174 more generally, depleted health status disrupts or reduces economic production or consumption
175 opportunities at the household or societal level [23].

176 It has been observed that in many developing countries the average consumption of non-health
177 related goods and services is close to the subsistence level, so households are often forced to
178 decrease domestic savings, to sell assets or to increase commercial or informal borrowings [19,20].

179 This has been practically observed with primary pyomyositis patients who complained about loss of
180 income and savings leading to several negative socioeconomic effects to themselves, family, and
181 community. The aggregation of these separate transfers frequently implies that increased health
182 expenditures exert an overall negative impact on savings at the societal level [23,24]. Several

183 studies have assessed this negative impact on savings and have shown that it is likely to be
184 considerable, especially in the case of epidemics such as HIV/AIDS [24,25,26,27]. On the other
185 hand, lower aggregate savings are likely to lead to increases in interest rates and the opportunity
186 cost of investment, which can then impact negatively on the formation of capital and ultimately on
187 economic growth [27].

188 Furthermore, several studies have suggested that improved health conditions exert a direct impact
189 on economic growth by increasing worker productivity [28,29,30,31]. A healthier workforce enjoys
190 greater physical and mental ability and therefore is able to produce more with the same amount of
191 inputs [30,31]. The aggregate impact on economic growth of increased labour productivity can be
192 quite substantial [30,31]. For instance, in an analysis of the economic impact of historical
193 improvements in nutrition in England and Wales, Fogel (1994) showed that around one third of the
194 growth of the British economy over the period 1780-1980 can be attributed to better nutrition and
195 greater efficiency in transforming nutritional input into economic value [32]. Furthermore, some
196 authors have argued that this effect is especially important in the context of developing countries,
197 since a high proportion of labour force in these countries is engaged in manual work and
198 productivity tended to be more reliant on the sheer physical capacity to work [33,34,35]. As already
199 observed the majority of the pyomyositis patients were school going children or peasant farmers
200 who earn their living through manual activities. In the case that they were sick, all their economic
201 activities come to a halt affecting the family, relatives and community.

202 In these cases therefore, health improvements that increases the number of healthy workers for a
203 fixed stock of land and capital in the economy might lead to higher unemployment or lower wages
204 [34,35]. Therefore, Pyomyositis often have several negative socioeconomic effects by constraining
205 an individual's ability to work and earn income. In this study, there were varying views among
206 patients, health workers and relatives about the socioeconomic effects of pyomyositis on patients,
207 families, communities and health facilities.

208 **3.2 Social effects of pyomyositis on the patient and family**

209 On the knowledge of the health workers to the social effects of pyomyositis, a nurse in the surgical
210 ward at Gulu Hospital said,

211 *"Pyomyositis is a very devastating disease to patients because it deprives the family of their bread*
212 *winners; isolates them; depresses them. They lose their social status in the community and confine*
213 *them to the hospital beds. Some family members have complained that pyomyositis prevents a*
214 *spouse from fulfilling their conjugal rights and in some instances it has led to family*
215 *misunderstanding, extramarital affairs and sometimes divorce".*

216 Similarly, in one of the focus group discussions, a patient with pyomyositis at Gulu Regional
217 Hospital said,

218 *"I have lost so much due to this disease because it deprived me from my routine earnings, isolated*
219 *me from my family, it made me to become depressed; I lost my social status in my community and*
220 *it confined me into this hospital bed, and denied me the opportunity to have my conjugal rights and*
221 *in some instances led my wife to have an extramarital affairs and my wife had threatened to*
222 *divorce me".*

223 On the issue of family matters and its linkages, another patient with pyomyositis at St. Joseph's
224 Hospital in one of In-depth interviews said,

225 *"Socially, I can no longer perform my duties as Chairman LC 1 because I have been sickly for a*
226 *very long time and now I am confined to this Hospital bed for some time now. I cannot sit on a chair*
227 *for a long duration and I am always in pain and sometimes my body smells bad and this makes me*
228 *feel out of place when in public gatherings. I can no longer attend community functions and most*
229 *members of my community claim that I can no longer lead them because I am always absent. This*
230 *has reduced my influence in the community activities and made me to become less approachable*
231 *although I still struggle to attempt to conduct my work normally".*

232 It has been observed that an important socioeconomic consequence of disease or injury at the
233 household level is that, through its impact on functioning, individuals are unable to perform their
234 usual day-to-day activities [33]. Just as being fit and healthy tends to boost productivity (particularly

235 in lower-income countries where employment opportunities tend to depend more on physical
236 strength and endurance; so poor levels of health restrict productivity [33].

237 **3.3 Economic effects of pyomyositis on the patient and family**

238 On the economic effect of the disease on a patient, another patient with pyomyositis at Kitgum
239 Government Hospital said,

240 *"I have lost so much income due to this disease; my business of retail trading has collapsed; I am*
241 *no longer receiving the profits from my business; my suppliers have stopped supplying me because*
242 *the previous bills have not been paid and the shop attendant has run away with my money from the*
243 *previous sales; I am therefore currently spending more than the profit I used to earn; and my*
244 *children have been chased away from schools because of lack of school fees".*

245 This observation is not new in that increased health expenditures are also foreseen to impact on
246 government's resources, by reducing the amount of household taxable income and increasing the
247 amount of expenditures that have to be covered out of public funds [36]. The resulting impact on
248 public budgets limits the government's ability to spend resources in other areas, particularly in
249 social expenditures such as education, health and in public investments in infrastructure projects,
250 sanitation, science and technology, and other strategic areas [36]. Public investment is a major
251 source of economic dynamism and economic growth in many developing nations [36].
252 Consequently, reductions in public investment resulting from increased health expenditures can
253 seriously compromise long-run economic growth potential [36]. On the other hand, tighter overall
254 budgets can compel governments to increase the level of taxation in order to meet increased
255 additional health expenditures [36]. This in turn can have macroeconomic repercussions by
256 depressing aggregate demand and therefore limiting the growth potential of the economy [36].

257

258 **3.2 Cost of the disease to the patient and health facility**

259 On the overall cost of the treatment of pyomyositis to the hospital, a theatre nurse of Gulu Regional
260 Hospital who has been in service for over ten years said,

261 *"The cost of treatment of pyomyositis is very high compared to other surgical diseases because of*
262 *several surgical equipments which have to be sterilized, sundries and dressing materials which*
263 *have to be used, expensive antibiotics which have to be used, anaesthetic agents, resuscitation*
264 *equipments and the long standing duration of illness and hospital stay. It would be good to prevent*
265 *the development of pyomyositis in this community" and she added further that, "we are actually not*
266 *sure of the exact cost of hospital management of one pyomyositis patient since most of the costs*
267 *incurred are not recorded but met by the Hospitals such as the electricity and water bills".*

268 *Similarly, in the Focus Group Discussions, there were no agreement on the total cost of the*
269 *disease to the patient and the family and they equally cited the lack of recorded costs to be used*
270 *for the verification of the total amount of money actually used".*

271 On the economic effects of the disease on the family and patient, an attendant of one pyomyositis
272 patient at Kalongo Hospital said,

273 *"This disease depletes resources from our hands through transport to and from the Hospital on a*
274 *daily basis. We have to pay for food, water and good diet for the patient. This has caused a lot of*
275 *financial stress to the family and relatives. We keep on borrowing from neighbours, friends and in-*
276 *laws and we hope when the patient recovers, he will have to work very hard to pay back the debts*
277 *we have accumulated over the period. We have sold nearly all our food store reserves from the*
278 *granary and we have moved through several steps in order to achieve healing or some remedies*
279 *for the illness. We, as a family are now becoming food insecure and no more money for school*
280 *fees for the children for the next term. We shall therefore need to take a bank loan although the*
281 *interest rates currently are very high. In summary, the disease is making our family to become*
282 *poor".*

283 Since the effects of changes in the demographic composition caused by diseases are intrinsically
284 dynamic, it is however possible that negative impacts in the present can be transformed into
285 positive shocks in the future and vice-versa [37,38]. Bloom and Canning (2000, 2008) described
286 the concept of "demographic dividend" as countries undergo a process of demographic transition
287 from high to low rates of mortality and fertility [39].

288 Improvements in health and sanitation conditions for example can cause significant declines in
289 rates of child mortality and consequent demographic explosion with exponential rates of population
290 growth [39]. Over time, as parents adapt to the new environment with low child mortality, the fertility
291 rates also tend to decline, with the effect that we will observe a baby boom cohort that is much
292 larger than both the preceding and the following birth cohorts [40]. Bloom and Williamson (1998)
293 examined the significance of this effect in explaining the rates of economic growth in East Asia
294 during the period 1965-1990 [40]. The results suggest that population dynamics account for 1.4-
295 1.9% of annual GDP per capita growth in the region during this period (approximately half of the
296 overall growth observed) [40]. Conversely, Bloom and Malaney (1998) estimated that reduced
297 population size caused by the mortality crisis seen in Russia during the 1990s contributed
298 significantly to reduced economic growth over this period [41]. It is therefore important to examine
299 the overall effects of a disease to the person, family, community and the whole country.

300 **3.3 Costs related to treatment of patients**

301 On the cost incurred by the Hospital in managing patients with pyomyositis, a nurse at Gulu
302 Regional Hospital said,

303 *"I estimate conservatively that we use about five hundred to one million Uganda shillings*
304 *(approximately \$400) to manage one pyomyositis patient and this excludes the personal cost to the*
305 *individual patient". She further added that, "the cost varied widely depending on the stages of the*
306 *disease, co-morbidities, nature and complications that may have already occurred on the patient.*
307 *Those with larger abscesses and in advanced stages of the disease were more likely to spend*
308 *longer time in the hospital and therefore larger amounts of money would be used".*

309 On the economic effect of the disease in running health facilities, an in-charge in the surgical ward
310 in Kitgum Government Hospital who was a key informant said,

311 *"Pyomyositis patients have increased the bed occupancy rates of our hospital because they spend*
312 *longer than other surgical patients; they use plenty of water; medical sundries and electricity that*
313 *have to be paid for by the Hospital. Their management grossly affects the utilization of resources in*

340 other hand, improvements in cognitive abilities can contribute to improve the quality of education
341 for a given level of schooling, which in turn can be expected to improve labour productivity [30].
342 In addition, productivity losses and lower working capacity resulting from disease and injury often
343 lead to reduced household earnings. This can have important aggregate implications, even though
344 some countries have counterbalancing mechanisms in place, such as systems of disability
345 insurance, that can help to mitigate the effects for the household. From a macroeconomic
346 perspective, however, the resulting lower economic efficiency implies that the overall level of
347 production for a given amount of inputs is reduced [30].
348 Lower productivity and income generation can exert knock-on effects on aggregate demand and
349 supply, which can hinder the pace of economic growth. For example, reduced spending power at
350 the household level might discourage firms from investing in productive capacity and contracting
351 workers, further intensifying the reduction in aggregate demand [30]. The second indirect channel
352 of impact of better health on economic growth identified by Weil (2007) is via increased incentives
353 to delay retirement and to save for retirement [30]. Some diseases that affect mostly working age
354 population groups and can contribute to reduce labour market participation and force people into
355 early retirement, reducing the average retirement age. This in turn can have important impacts on
356 the dependency ratio in the economy and by extension on potential economic growth [30].
357 Moreover, the additional numbers of individuals that are forced into early retirement often require
358 special medical care and specialized services. This can contribute to reduce the amount of
359 resources that can be directed into productive activities and can also exert cost pressures on
360 businesses, via increased health care costs and insurance premiums [30]. On the other hand, the
361 expectation of longer retirement periods resulting from mortality improvements often leads to higher
362 savings during active life, which in turn can contribute to increase the stock of physical capital per
363 worker [30]. As discussed above, the third channel through which health improvements affect
364 economic growth is via improved incentives to investing in education due to longer payoff periods
365 in the labour market [30].

366 Changes in the demographic composition of a nation can have significant impacts on economic
367 performance and for instance, changes resulting from mortality variations that increase the
368 dependency ratio can impact on economic growth [30]. Reductions in the size of the working age
369 population due to sexually transmitted pandemic diseases such as HIV/AIDS are a case in point
370 [30].

371 **3.5 The way forward with regards to pyomyositis**

372 On the way forward, an attendant of one of the patients in Kitgum Government Hospital suggested
373 that because pyomyositis was so rampant in the communities where they live, it was advisable that
374 intense mobilization and sensitization of the community should be undertaken to dispel the
375 misconceptions about it and also design an activity that should remedy the socioeconomic effects
376 of the disease. She suggested that the mobilization and sensitization should include the elders,
377 opinion leaders, church leaders and local government officials so as to reach all persons in the
378 community that still suffer quietly with the disease.

379 **4. CONCLUSION**

380
381 There is a wide range of socioeconomic effects of primary pyomyositis to the population of
382 Northern Uganda and it presented with a number of socioeconomic effects similar to those
383 experienced in chronic diseases such as HIV/AIDS.

384

385 **CONSENT**

386 All authors declare that written informed consent was obtained from the patients, next of kin,
387 families, health workers and communities for publication of this manuscript. A copy of the written
388 consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this
389 journal.

390

391 **ETHICAL APPROVAL**

392

393 All authors hereby declare that the protocols have been examined and approved by the appropriate
394 Ethics Committee and have therefore been performed in accordance with the ethical standards laid
395 down in the 1964 Declaration of Helsinki.

396

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409

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